LET'S COMPUTE!

99p

No 6 January 1991
A Database Publication

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REGULARS

Rom and Ram	GOTO 13
The Games Gang	GOTO 18
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How to Make Money	GOTO 25
How a Computer Works	GOTO 27
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Logo Lowdown	GOTO 43

Noticeboard

I think that the idea of a database listing is brilliant. I also liked the secret message maker in the November issue.

I have an Atari STE. But your programs and competitions never list it. Could you please say which will work on the STE?

– Owen Williams (12), Halstead, Essex.

In general, any program for an ST should work on an STE. All the programs listed for the ST in *Let's Compute!* work on either.

Remember, the programs are all designed to work in STOS. You must Run that before typing in the *Let's Compute!* programs.

I would really like to own one of the *Let's Compute!* caps. But in case I don't get a letter printed in your mag why don't you let people buy the caps?

– Ryan Simpson, Craigavon, County Armagh.

You don't need to buy one because we've printed your letter. One goes free to the writer of EVERY letter we print.

If anyone else wants one they can get them for £3.

Send a cheque or postal order to: *Let's Compute!* Europa House, Adlington Park, Macclesfield SK10 4NP.

If you have any tips for other readers, send them in. And if you have any questions about your computer or software just ask us. We'll try to answer them on the Noticeboard.

Let us know what you want to see in future issues. And if we use your letter or ideas we'll send you a *Let's Compute!* baseball hat!

Send your letters to:

***Let's Compute!* Europa House, Adlington Park, Macclesfield SK10 4NP.**

Remember to tell us your age.

On a recent visit to the USSR I had a stroll through the Exhibition of Economic Achievements. I noticed a rather interesting exhibit – a Russian-made home computer. The photograph shows what it looks like. It's only used to cast horoscopes and doesn't seem to have any backing store such as a disc drive.

I assume all the software needed for the forecasts is held in the computer's memory. If anyone knows any more about these contraptions I'd love to hear.

They look like the sort of thing Sir Clive Sinclair may have designed. I wonder if he had anything to do with it?

– Marshal Anderson, Milton Keynes

Send for your full set of badges . . .

The badge we gave free on the cover of the issue is just one of the set of four shown above. There's still time to get your set.

Just send two £1 coins to *Let's Compute!* Badge Offer, PO Box 2, Ellesmere Port, South Wirrral L65 3EB.

AND HERE'S A SPECIAL OFFER FOR LET'S COMPUTE CLUB MEMBERS!

Club members can get the badges for half price. Just quote your membership number and send one £1 coin when you order.

Remember to tell us your name and address!

I've written a short program for my Spectrum and think it would be ideal for *Let's Compute!* But I don't know if it will work on other computers.

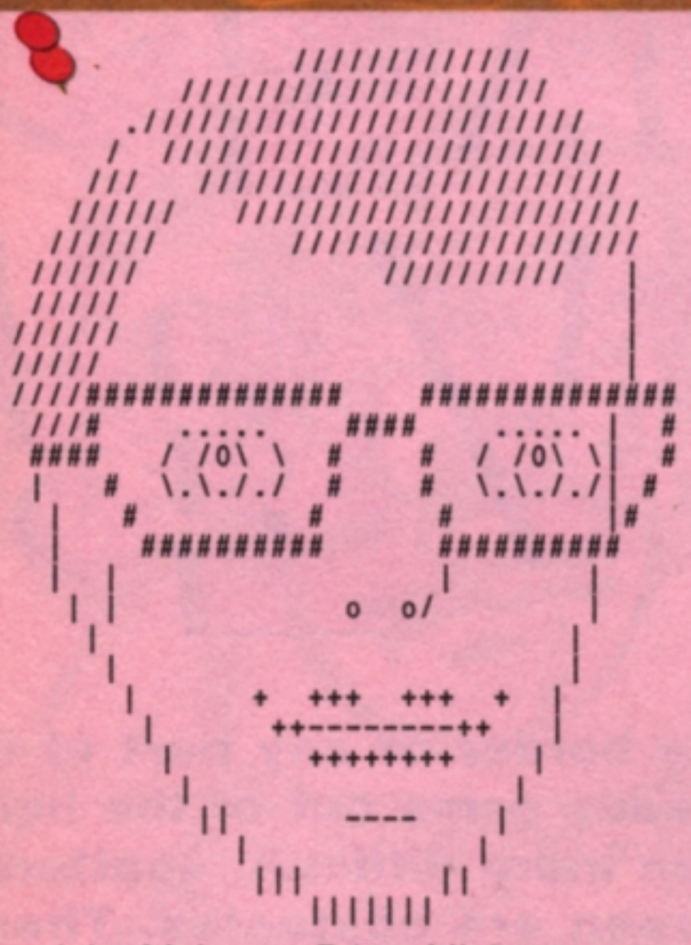
Is it worth me sending it to you?

– Alan Short (14), Glasgow

We love to see readers' programs and hear their ideas. If we like them, we can convert them to all computers. If it's only an idea we can write the program from scratch.

When you send us programs or ideas remember to include your name and address. It's also handy if you can let us know a phone number where we can contact you.

board



John Major .....Prime Minister

Wow! That was quick. John Major became Prime Minister on November 28 and this picture from Michael Wood (14), Storbridge, West Midlands arrived at the *Let's Compute!* office on November 30.

That was just in time for it to be entered in our Alphabet Artist contest. The judges are now hard work deciding who will get all the prizes of gift vouchers and Art Studio programs from Impact Software.

The winners will be announced in the next issue of *Let's Compute!*

I think ***Let's Compute!*** is brill! I have really got to grips with Logo. I think all your competitions are each very different but all very good.

Will there be any competitions or special offers for club members?

– James Attwood (11), Clevedon, Avon

Last month club members could buy badges for half price. This month, in the contest on page 9, there's an extra prize that's only for club members.

That's just a start. We've lots more offers and competitions planned for the future.

Hope you like my drawing!
P.S. Let's Compute is brill!
yours
H. Hughes HADYN HUGHES, WOLVERHAMPTON AGE 11!

HIGH SCORES!

Your high scores are still flooding in. There are more than ever on Page 39.

If you haven't sent your scores yet – or want to send us more – there's another coupon on the page. If you don't want to cut up your *Let's Compute!* just copy it onto a piece of paper.

I typed in the Witches' Brew program from the October issue. I made all the changes given for a CPC so it would work on my CPC 6128.

When I had finished it came up with *Syntax error in 410*. That l;ine is:

```
410 LET R=FNr(21)
```

I typed it in exactly as it is printed in *Let's Compute!* Was something wrong with it?

– Ryan Baldwin (10), Luton, Beds.

We often get letters saying that the computer reports an error in a line that has been typed in exactly as printed. Well, sometimes the computer reports the wrong line number.

One of the most common is, for example, *Out of Data in Line 10*. Suppose Line 10 is:

```
10 READ A,B
```

There is no DATA line so you'll get the error although there's nothing wrong with Line 10 itself. Type it in and RUN it to check. Now enter Line 20:

```
20 DATA 1234
```

When you RUN it you'll still get an error message saying Line 10 is wrong. But the mistake is in Line 20. Change it to:

```
20 DATA 12,34
```

The error will have gone. Your computer now has two numbers to read in to memory locations A and B. So even a missing comma in Line 20 causes an error to be reported in Line 10.

Your problem with FNr is similar. The program works as printed.

You must have made a mistake as you typed it in. Check Line 30. Although the error message says Line 410, a mistake in that Line 30 would cause the same message.

Think you're quick on the trigger? This fast-action game will test you to the limit!

SNAKES ALIVE!

Here's an action packed game that's full of fun. Type it in and play it just as it is.

But, to add to the fun, we list below loads of suggestions for changes. Some are simple and can be done by anyone. Others will prove a challenge even to more expert programmers.

Once you've typed it in and played it a few times, see how you can improve it. Experimenting and changing a working program is a great way to learn about computing.

In the game a long snake comes out of a hole in your computer screen. But how much of it can come to the surface before it collides with something?

Move it round the screen with care. Don't let it touch the border or any part of its body that's already come out of the hole. To make it even more difficult, scattered around the screen are obstacles. These must be avoided at all costs.

The idea is to keep going for as long as you can. You'll need to be quick to miss all the things on the screen. And you have to use all your skill to work out the best way to move around.

Your score, and the highest previous one, are shown at the top of your screen. *Can you do better?*

Type it in, SAVE it and RUN it. Let us know your high score. We'll put the best on the High Score Challenge table.

ADAPTING YOUR GAME

There are lots of ways you can change this program to make your own game. Here are just a few ideas:

● **Change the shapes.**

The letters used to draw the snake, the border and the obstacles are set in Lines 50, 60 and 70. Alter these to any letters you want. If your computer has keys that produce graphic characters you can use these instead.

Do you know how to define characters and use colour on your computer? Then you can use bricks for the border, bombs for the obstacles and a slimy-looking green shape for the snake.

● **A different game each time**

Use your computer's random feature so that some or all of the above are changed each time you play.

● **Use different playing keys**

Lines 190 to 220 sets the keys you use to play the game. Change these as you wish.

You could even change these lines so that you can use a joystick or the joyboard described on Pages 10 and 11.

● **Set the speed**

Line 80 contains a number that sets the speed of the game. Make it larger if the game is too fast for you. Reduce it for a bigger challenge.

● **Modify the display**

Line 30 contains numbers that define the size of the playing areas. Reduce the numbers and you'll get a smaller area.

This makes it more difficult to get a high score!

● **Add noise**

Put some sound instructions in the program.

● **Alter the number of obstacles**

Line 40 lets you have about 40 obstacles. You can have more or less.

Note that we say about 40 because an obstacle may be drawn on top of one that is already there. Each time this happens one less will be displayed.

● **A better crash!**

Lines 680 to the end of the program are the crash routine. Put anything you want there: flashing screens, explosions and so on.

Remember to put the word RETURN on the last line.

● **High Scores**

Give the game a high score table.

● **A maze game**

Make the obstacles form a maze so you can guide the snake to freedom.

THE KEYS TO USE:

Up ..... K
Down .... M
Left .... Z
Right ... X
Pause ... Any other key
NOTE: *USE CAPITAL LETTERS*

IS THIS YOUR COMPUTER?

ATARI (Stos)/Amiga (Amos)

Change the following lines:

```
 30 LET W=40:LET D=20:REM SCREEN SIZE
 80 LET T=200:REM SET SPEED
110 MODE 0:KEY OFF:HIDE ON:CURS OFF
310 LET K$=INKEY$
360 PRINT LOCATE X-1,Y-1:A$;
390 LET X=RND(W-2)+1:LET Y=RND(D-8)+6
```

Commodore 64/128

Change the following lines:

```
 30 LET W=38:LET D=25:REM SCREEN SIZE
110 PRINT CHR$(147);
310 GET K$
360 POKE 211,X-1:POKE 214,Y-1:SYS
58732:PRINT A$;
390 LET X=INT(RND(0)*(W-2))+2:LET
Y=INT(RND(0)*(D-8))+7
```

Spectrum

Change the following lines:

```
 30 LET W=32:LET D=22:REM SCREEN SIZE
110 CLS
310 LET K$=INKEY$
360 PRINT AT Y-1,X-1;A$;
390 LET X=INT (RND*(W-2)+2):LET Y=INT
(RND*(D-8)+7)
```

PC (GW Basic)

Change the following lines:

```
 30 LET W=40:LET D=24:REM SCREEN SIZE
110 SCREEN 1:CLS
310 LET K$=INKEY$
360 LOCATE Y,X:PRINT A$;
390 LET X=INT(RND*(W-2))+2:LET
Y=INT(RND*(D-8))+7
```

Amstrad CPC

Change the following lines:

```
110 MODE 1
310 LET K$=INKEY$
360 LOCATE X,Y:PRINT A$;
390 LET X=INT(RND*(W-2)+2):LET
Y=INT(RND*(D-8)+7)
```

```
 10 REM THE SNAKE GAME
 20 REM (C) LET'S COMPUTE!
 30 LET W=40:LET D=32:REM SCREEN SIZE
 40 LET N=50:REM NUMBER OF OBSTACLES
 50 LET W$="0":REM SHAPE OF OBSTACLES
 60 LET Y$="*":REM SHAPE OF SNAKE
 70 LET B$="#":REM SHAPE OF BORDER
 80 LET T=20:REM SET SPEED
 90 LET B=0:DIM A(W,D)
100 REM START OF GAME
110 MODE 4
120 LET K$="F":LET S=0
130 GOSUB 470:REM WRITE WORDS AT TOP
140 GOSUB 530:REM DRAW BORDER
150 GOSUB 420:REM DRAW OBSTACLES
160 GOSUB 390:REM SNAKE'S START POS.
170 GOSUB 300:REM CHECK KEYPRESS
180 LET C=0
190 IF K$="Z" THEN LET X=X-1:LET C=1
200 IF K$="X" THEN LET X=X+1:LET C=1
210 IF K$="K" THEN LET Y=Y-1:LET C=1
220 IF K$="M" THEN LET Y=Y+1:LET C=1
230 IF C=1 AND A(X,Y)=1 THEN GOSUB 680
:GOTO 110
240 IF C=1 THEN LET A(X,Y)=1:LET S=S+1
:LET A$=STR$(S)
250 IF C=1 THEN LET X1=X:LET Y1=Y:LET
X=11:LET Y=3:GOSUB 360:LET X=X1:LET Y=Y1
260 IF S>B THEN LET B=S
270 LET A$=Y$:GOSUB 360
280 GOTO 170
290 REM GET KEY
300 FOR I=1 TO T:LET R$=K$
310 LET K$=INKEY$(0)
320 IF K$="" THEN LET K$=R$
330 NEXT I
340 RETURN
350 REM TAB
360 PRINT TAB(X-1,Y-1);A$;
370 RETURN
380 REM PRINT AT RANDOM POSITION
390 LET X=RND(W-2)+1:LET Y=RND(D-8)+6
400 RETURN
410 REM OBSTACLES
420 LET A$=W$
430 FOR I=1 TO N
440 GOSUB 390:GOSUB 360:LET A(X,Y)=1
450 NEXT I
460 RETURN
470 REM DRAW TOP OF SCREEN
480 LET X=(W-30)/2+1:LET Y=1:LET A$="T
HE LET'S COMPUTE! SNAKE GAME":GOSUB 360
490 LET X=3:LET Y=3:LET A$="SCORE = ":
GOSUB 360
500 LET X=W-11:LET A$="BEST = "+STR$(B
):GOSUB 360
510 RETURN
520 REM DRAW BORDER
530 LET X=W/2-6:LET Y=6:LET A$="PLEASE
WAIT":GOSUB 360
540 FOR X=2 TO W-1:FOR Y=7 TO D-2
550 LET A(X,Y)=0
560 NEXT Y:NEXT X
570 LET A$=B$
580 FOR X=1 TO W
590 LET Y=6:GOSUB 360:LET A(X,6)=1
600 LET Y=D-1:GOSUB 360:LET A(X,D-1)=1
610 NEXT X
620 FOR Y=7 TO D-2
630 LET X=1:GOSUB 360:LET A(1,Y)=1
640 LET X=W:GOSUB 360:LET A(W,Y)=1
650 NEXT Y
660 RETURN
670 REM CRASH
680 LET X=W/2-4:LET Y=D/2+1
690 LET A$="CRASH":GOSUB 360:GOSUB 300
700 LET A$="     ":GOSUB 360:GOSUB 300
710 PRINT:PRINT:PRINT "PRESS SPACE!!!"
720 IF K$<>" " THEN GOTO 690
730 RETURN
```

fun school 3

Count up to nine to help teddy get the honey

Pair the large letters at the alphabet fair

Tell the time and watch the clock come alive!

Guide the frog from log to log to solve the sums

Correct spelling, grammar and punctuation mistakes

Follow the directions to find the buried treasure

Learning is now even more fun!

Fun School 3 is everything you – and your children – ever wanted from educational software: **SIX** challenging programs in each pack which fulfil the exacting requirements of the National Curriculum. Plus: Stunning graphics; exciting sounds; carefully structured levels so your children can have fun and learn at their own pace. And all are designed by the winning team which created **Fun School 2**, the biggest-selling educational package ever!

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In the autumn: *BBC, Electron and Archimedes*

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Commodore 64	9076	9077	9078	9079	9080	9081
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Over £600 of printers to WIN for YOUR school!

How would you like to win a brand new printer for your classroom? That's the chance being offered all our readers by Mannesman Tally.

The hard-working MT81 is ideal for classroom use. Worth £159, it's an 80-column, 9-pin dot matrix printer.

It has a special paper parking facility, which lets you to switch easily from one type of paper to another.

There are two of these superb printers to be won. All you have to do is answer the four questions below. Fill in the entry form and get your teacher to sign it. Then send it to *Let's Compute!* to arrive no later than January 31, 1991.

If you win you'll be the most popular person in your school!

1 Which of the following isn't a computer language?
Logo, Basic, Pascal, Mouse

2 One of these computers doesn't use tapes. Which one?
C64, Spectrum, Amiga, Amstrad CPC

3 Which of the following isn't a computer company?
Orange, Apple, Acorn, Apricot

4 Which term isn't related to printers:
dot matrix, ferris wheel, inkjet, daisy wheel

PLUS: For Let's Compute! Club members

Panasonic are offering members of the Let's Compute! Club a fantastic 24-pin printer for their classroom.

The Panasonic KX-P1123 is easy to use and the very latest model. It comes with a vast choice of type styles and fonts.These allow you to use many different sorts of characters.

Like all 24-pin printers, it gives you a finer quality of print as you have smaller but more pins. It is also faster than a standard 9-pin printer.

It has loads of other special features and at £295 is extremly good value for money. Just make sure that your membership number is on the Entry Form. If you have all the correct answers, your entry will immediately go into this draw as well as the Mannesman Tally one.

PRINTER CONTEST ENTRY FORM

Your Name.....

Teacher .....

Class .....Age.....

School .....

School address .....

.....

.....

School Phone No. .....

Post Code.....Signed .....(Teacher)

Answers:

1 .....

2 .....

3 .....

4 .....

Now send this to: Printer Contest, *Let's Compute!*, Europa House, Adlington Park, Macclesfield SK10 4NP.

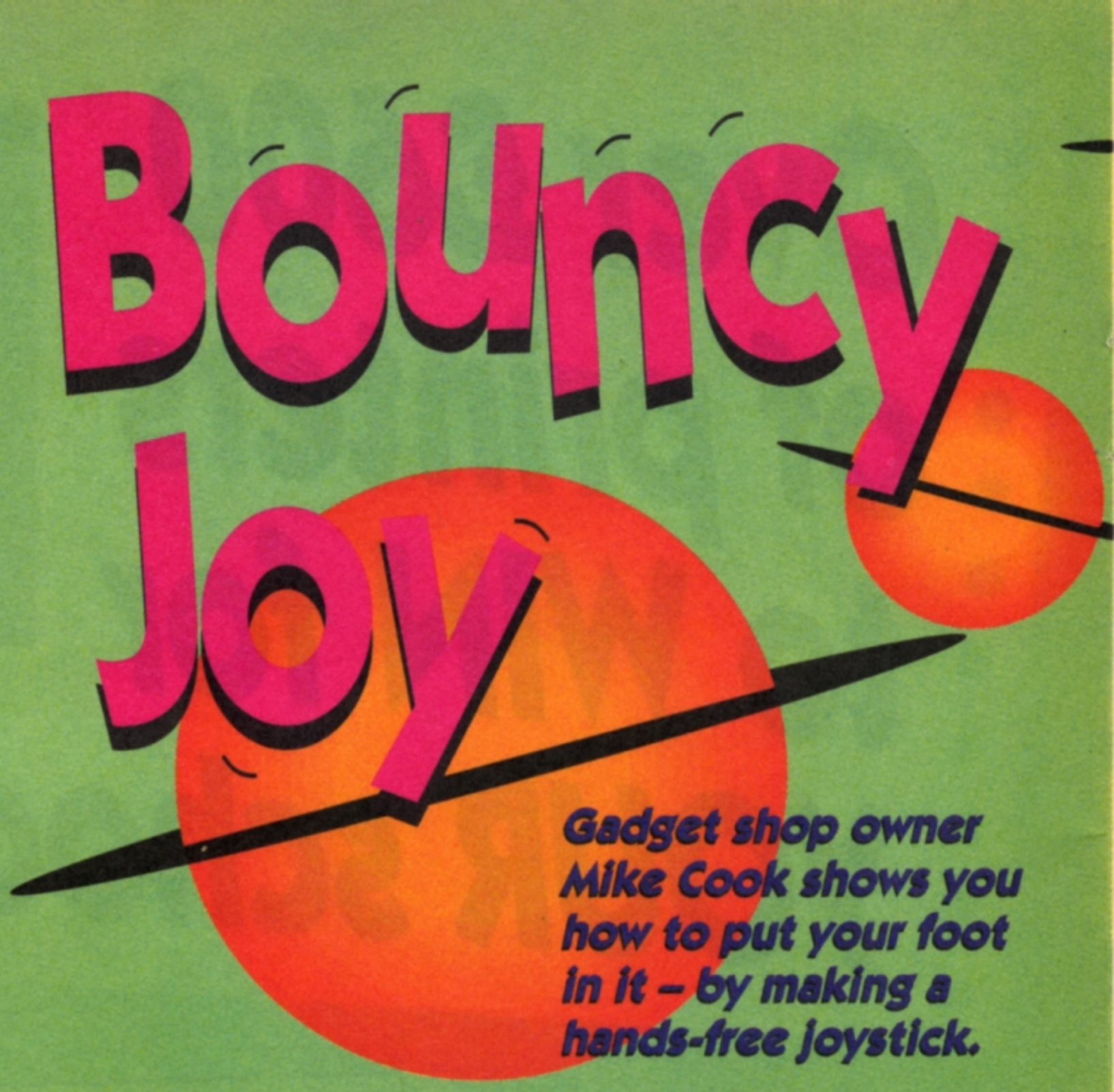
ANYONE can take part in this contest and win one of the Mannesman Tally printers.

But the Panasonic prize can only go to a member of the Let's Compute! Club. If you've joined the club, write your membership number here:

.....

The Gadget Shop

Bouncy Joy



Gadget shop owner Mike Cook shows you how to put your foot in it – by making a hands-free joystick.

Are you tired of using the same old joystick? Are you getting too good at zapping the bad guys? Have your old games lost their challenge?

If your answer to any of these questions is yes, this month's gadget is just what you've been waiting for. It's a completely new kind of joystick. You use it with your feet!

How do we make one? It's quite simple.

A joystick is really nothing more than four switches. At any time only one is turned on. The rest are off.

Our joystick will have four switches – but mercury ones. We met these in the October *Let's Compute!* when we made a Sauce Bottle game.

When the switch is tilted a drop of mercury moves and forms a circuit between two wires.

What can we use as our joyboard? I suggest you use a toy that is is sold under lots of different names, like Moon Bouncer or Space Hopper. It's a round disc with half a rubber ball attached to each side.

The idea is that you stand on the disc and grip the top ball between your ankles and bounce. I always fell over so it didn't use it much.

But now it's got a completely new use. It's the ideal platform for a foot operated joystick!

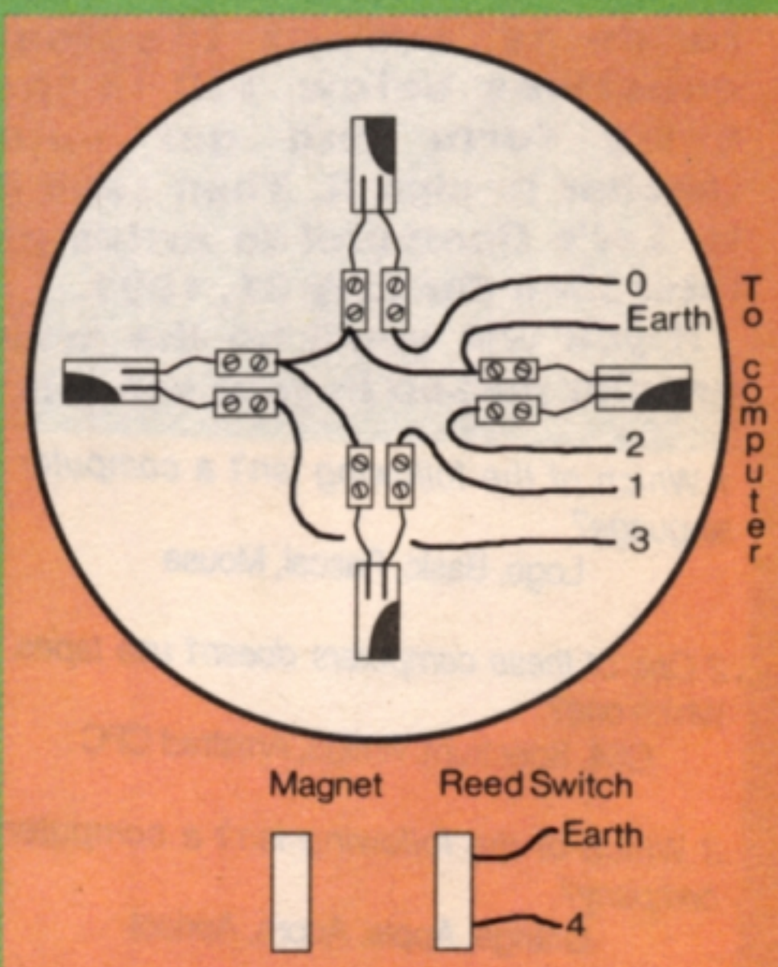
Let's start by connecting the switches. If your computer has a 9-pin joystick socket they should be wired up as in the diagram alongside.

The numbers shown refer to the screw connections on the Gadget Shop connection board. It's the same board we've used before. *(If you haven't already made one, you can order one using the form on the right. The pack comes with full instructions.)*

Some computers, like the BBC Model B and Master, have a 15 pin joystick connector. For these you need an Analogue Port connector.

This is just like the User Port Gadget Shop connection only it has a 15 way plug on it. It can be ordered using the same form and comes complete with instructions on how to make a connector block. The diagram on the right below shows how to wire the switches to it.

Before we go any further let's try it out. Hold all the mercury switches with the wires pointing up.



How to thread the wires through the card

FOR ALL COMPUTERS

This gadget is suitable for any computer that uses a nine-pin joystick plug. Using the modifications in the text it can also be used on a BBC Model B, Master and Electron with Plus One.

IN THE SHOP SOON: ● AUTO MONEY BOX

Then load your favourite joystick-controlled game. Turn each switch upside down in turn and watch your screen. Each movement should change direction in the game.

The next job is to mount the four switches on the underside of the Space Hopper. They have to be arranged so that when the platform is level no connection is made.

But position the switches so that slightly tilting the platform will turn-on the appropriate one. The diagram shows how it all goes together.

At first it is best to fix the mercury switches with a small piece of plasticine. Once it is all working you can glue them in position to make them permanent and resistant to knocks.

Now all we need is a fire button. We can use a surface mounting reed switch and magnet. Remember, we used them in October's *Let's Compute!* when we made a burgler alarm. Connect this switch as shown in the diagram.

Attach it to one leg just above your knee and the magnet to the other. When you want to zap just knock your knees together.

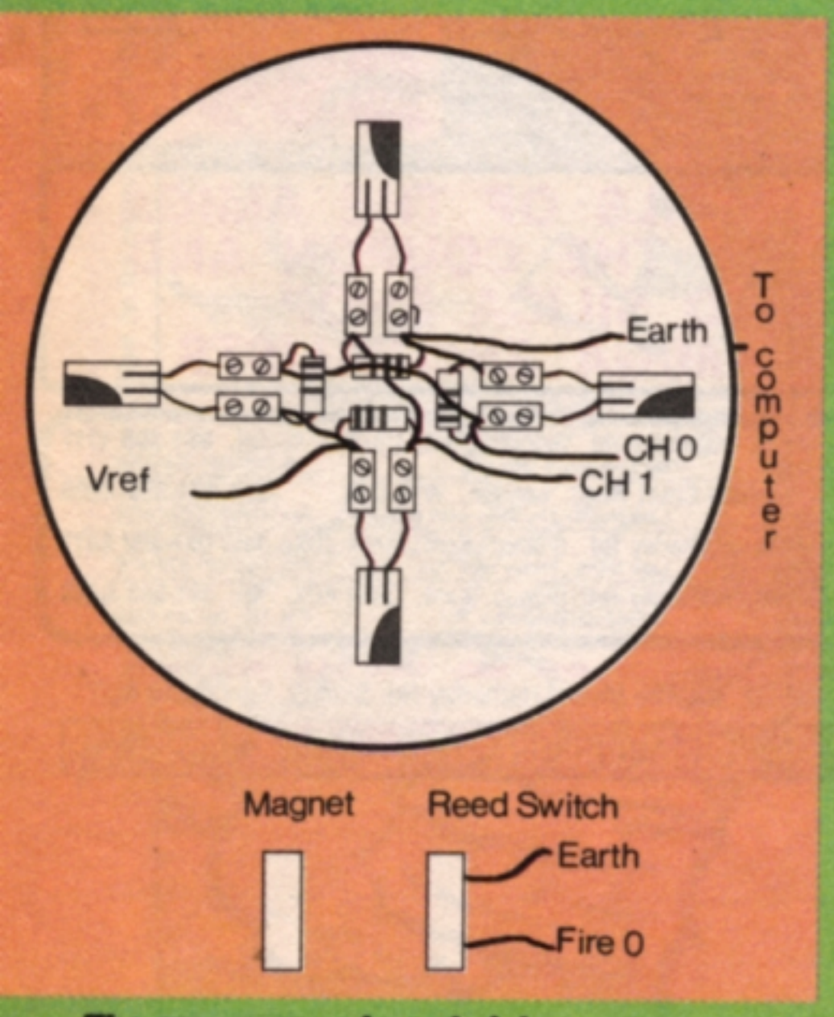
You can use an elasticated bandage or something similar to fasten them on.

The mercury switches can be connected using separate wires, but for neater results use six core cable. Similarly the reed switch should be mounted using twin core cable.

As you may have some of this wire at home I have made it a separate item on the order form. This means you don't pay for something you already have.

Now you are ready to put your foot joystick to the test. You get best results if you're seated because you can't really play a computer game while you're hopping around

But happy zapping all the same!



The pressure pad sandwich

For BBC Model B, Master and Electron users only

Your computer needs an analogue voltage to be produced by the joyboard. This means that instead of switches being off or on, a high or low voltage shows in which direction the board is being moved.

So, if the joyboard is level it must give a mid voltage. This is what the wiring diagram here does. It shows how you should wire your foot-operated joystick to your computer.

The resistors act as a voltage divider and when there is no movement it produces a mid voltage. When the switches close they short out the resistor and give the right voltage.

NEXT MONTH

Roll the balls and ring the bells! Build the Gadget Shop's super pinball machine.

ORDER FORM

Pack 6 – Foot-operated joystick

Mercury Switch and screw connectors £2 each (4 needed)

6 core cable ..... metres at 80p a metre (2 recommended)

Twin core cable ..... metres at 30p a metre (1 recommended)

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Surface mounting reed switch and Magnet £2.60

Show what you want by ticking the correct box below.

☐ Floor pressure pad .... £3.55 each.

You'll also need Pack 1 – the User Port connector cable:

☐ 20 way IDC plug, length of 20 way ribbon cable, 12 way chock block, cardboard base, 2 foam sticky pads PLUS 2 spare connectors and a resistor £1.99

☐ As above but with IDC plug ready connected ...£2.49

☐ As above but with connector for Master Compact in place of IDC plug ... £3.99

☐ As above but with connector for joystick port of Spectrum, Amstrad CPC, Commodore 64/128, ST or Amiga in place of IDC plug. Basic program and instructions will also be supplied ... £3.99

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.....

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A500 BATMAN PACK

The Commodore A500 Batman Pack must surely rank as one of the most popular computer packs ever! The pack features the **Commodore Amiga 500 computer** with **mouse controller** and **TV modulator**, plus four top software titles. The software includes: **'Batman The Movie'** - Rid Gotham City of the cunning joker, in Ocean's top selling title based on the blockbuster Batman film; **New Zealand Story** - high quality conversion of the leading arcade game; **Interceptor** - Dogfight with two F-16's in this leading flight simulator; **Deluxe Paint II** - top quality Amiga graphics package which set the standard for others to follow. Return the coupon for further details.

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A500 Computer & Mouse	£399.99
A520 TV Modulator	£24.99
Batman The Movie	£24.95
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AMIGA 2000

For the more serious or professional applications user, Commodore have a selection of systems based around the expandable Amiga 2000, at prices from £1295+VAT. The A2000 features a full 1Mb RAM (expandable to 9Mb), 9 system expansion slots, plus IBM compatibility with the use of PC-XT or PC-AT bridgeboards. Complete and return the coupon, putting a tick in the A2000 box, for details of A2000 computer systems.

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FLIGHT OF FANTASY

Flight of Fantasy is the very latest Amiga 500 pack from Commodore, featuring BRAND NEW software releases, to make this the most spectacular A500 pack ever! The pack features the Amiga 500 computer with mouse controller and TV modulator, as well as four top software titles. These include the following:

DELUXE PAINT II:

The high quality graphics program that set the standard for other Amiga art packages. Deluxe Paint II includes powerful, easy to use tools that bring out the artist in you. Create masterpieces, presentations, 3D perspectives or just doodle.

ESCAPE / ROBOT MONSTERS:

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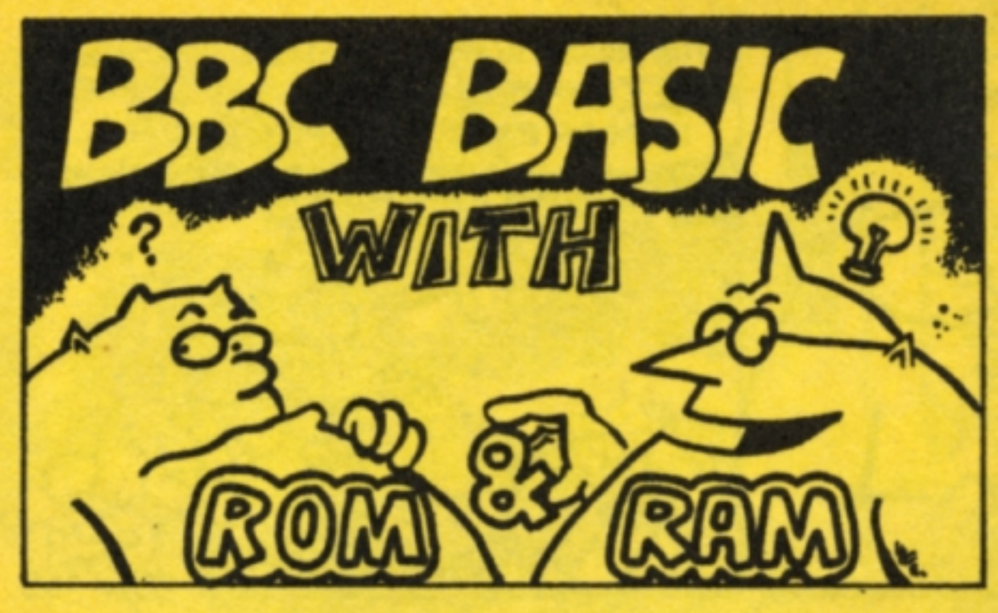
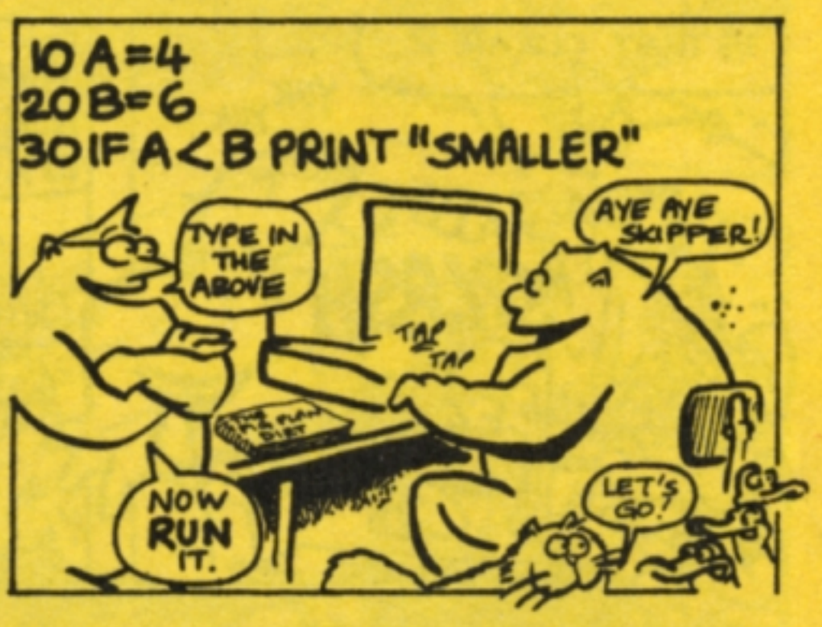
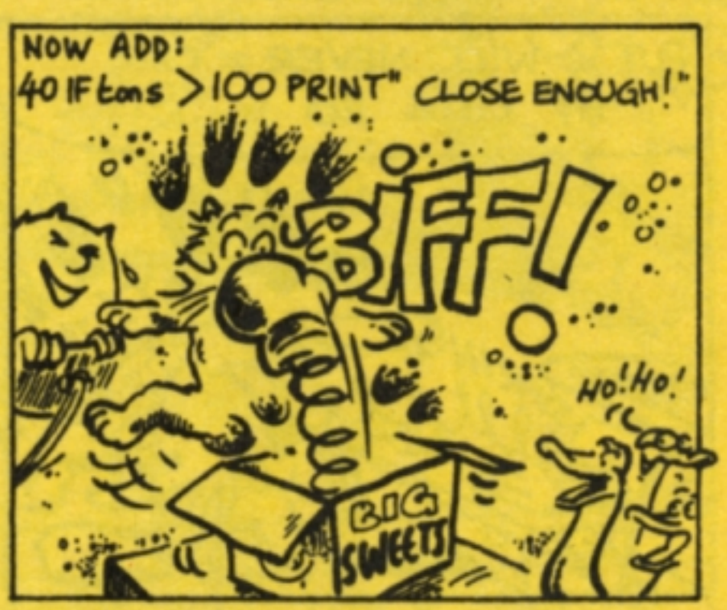
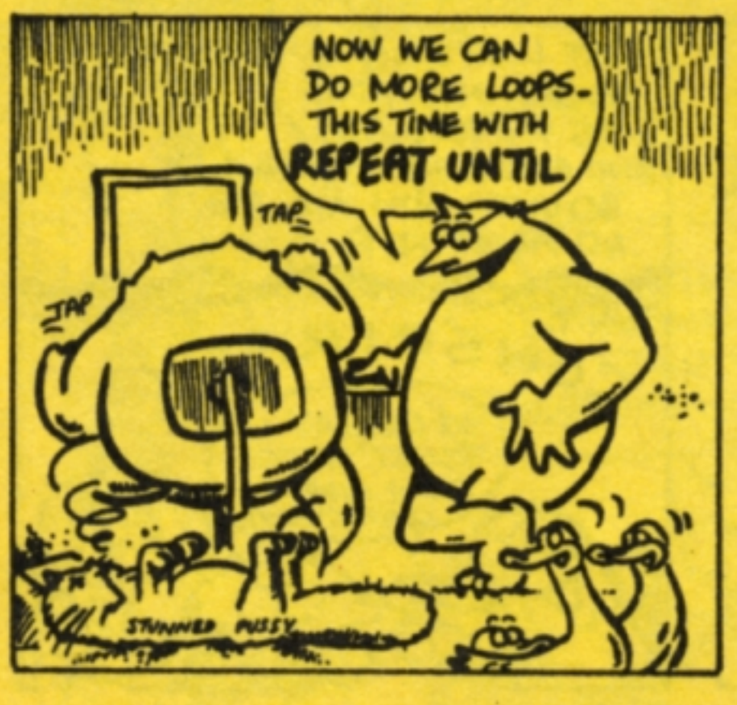


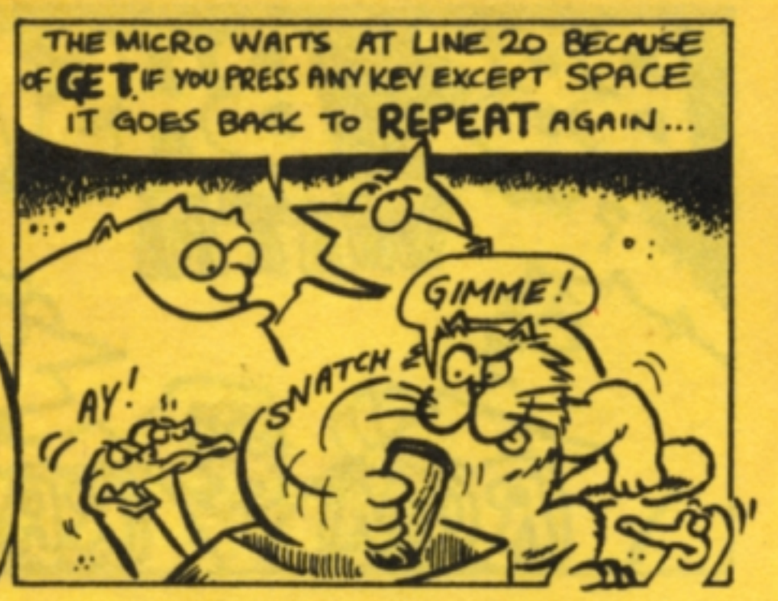






CHANGE LINES 10 AND 20 TO:
10 REPEAT
20 UNTIL GET=32
YUP!
DRINK FUNTA ORANGE!

A REPEAT UNTIL LOOP CONTINUES UNTIL THE CONDITION IS MET - IN THIS CASE UNTIL GET=32
THAT'S UNTIL I PRESS SPACE.


THE MICRO WAITS AT LINE 20 BECAUSE OF GET. IF YOU PRESS ANY KEY EXCEPT SPACE IT GOES BACK TO REPEAT AGAIN...
GIMME!
SNATCH
AY!

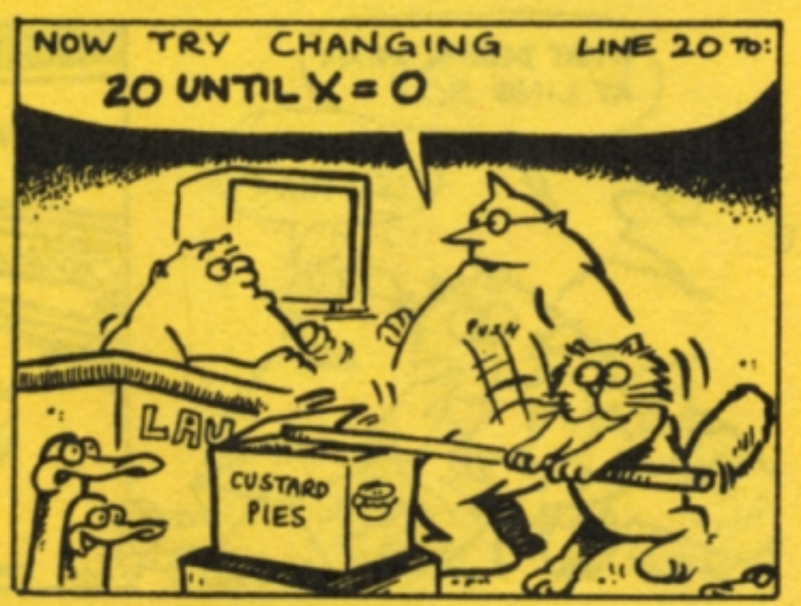
IS THAT CLEAR?
YUK YUK!
SPLASH

ADD THESE LINES TO MAKE IT CLEARER - AND RUN IT.
5 X=0
15 X=X+1:PRINT X
JUSTICE!
HO HO
YUK! FOOD!!!

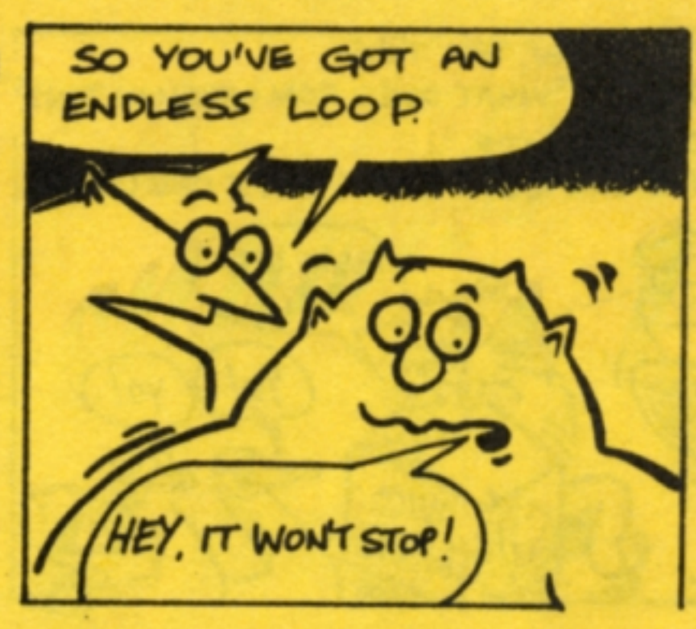
NOW YOU SEE HOW THE LOOP GOES ROUND WHEN YOU PRESS KEYS.
THIS IS NO GOOD! HE'S GOT FOOD HIDDEN SOMEWHERE.

MAYBE THIS IS A BETTER EXAMPLE. CHANGE LINE 20 TO:
20 UNTIL X>8
NOW RUN IT.
LAUNDRY
GET ME A STICK!

THE LOOP KEEPS GOING UNTIL X EQUALS 9. THAT IS UNTIL IT'S TRUE THAT X>8
CRUSH

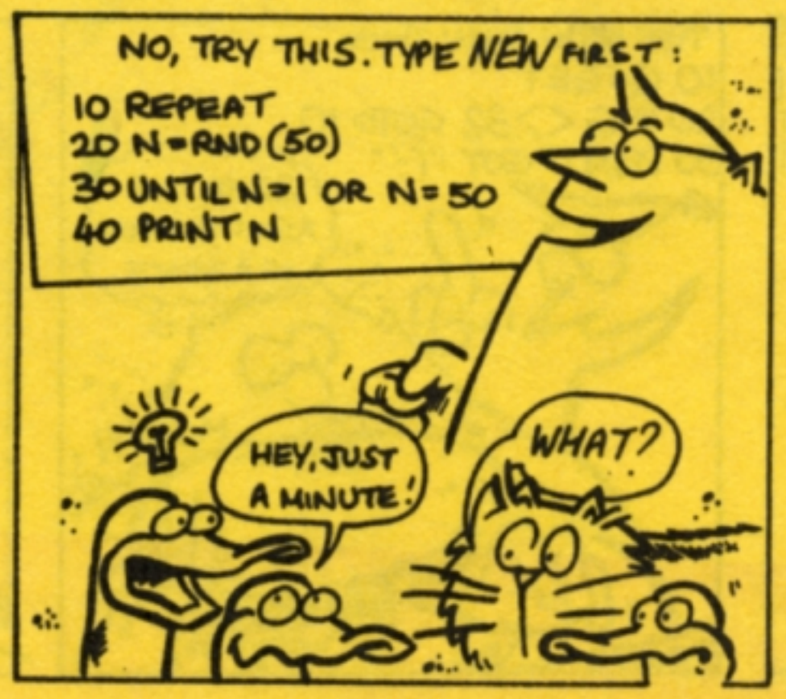

NOW TRY CHANGING LINE 20 TO:
20 UNTIL X=0
LAU
CUSTARD PIES

BUT X WILL NEVER=0 AT LINE 20
SPRING!
SPLAT!
YUK!

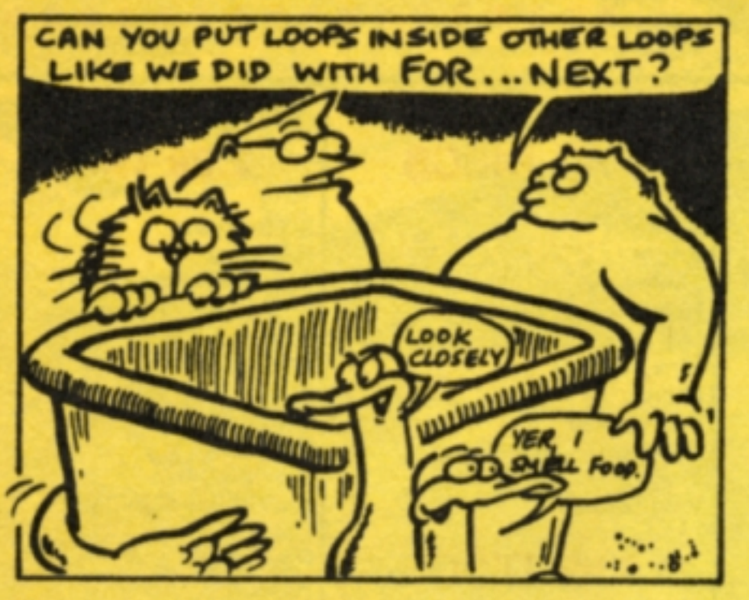

SO YOU'VE GOT AN ENDLESS LOOP.
HEY, IT WON'T STOP!

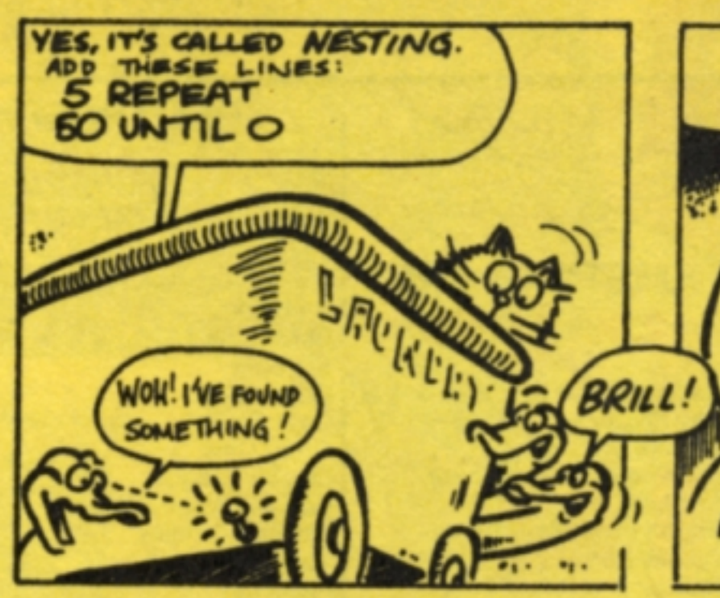
PRESS ESCAPE TO GET OUT OF IT.
LOOK, ALL THOSE BOXES ARE BOOBY-TRAPPED!
YEH!

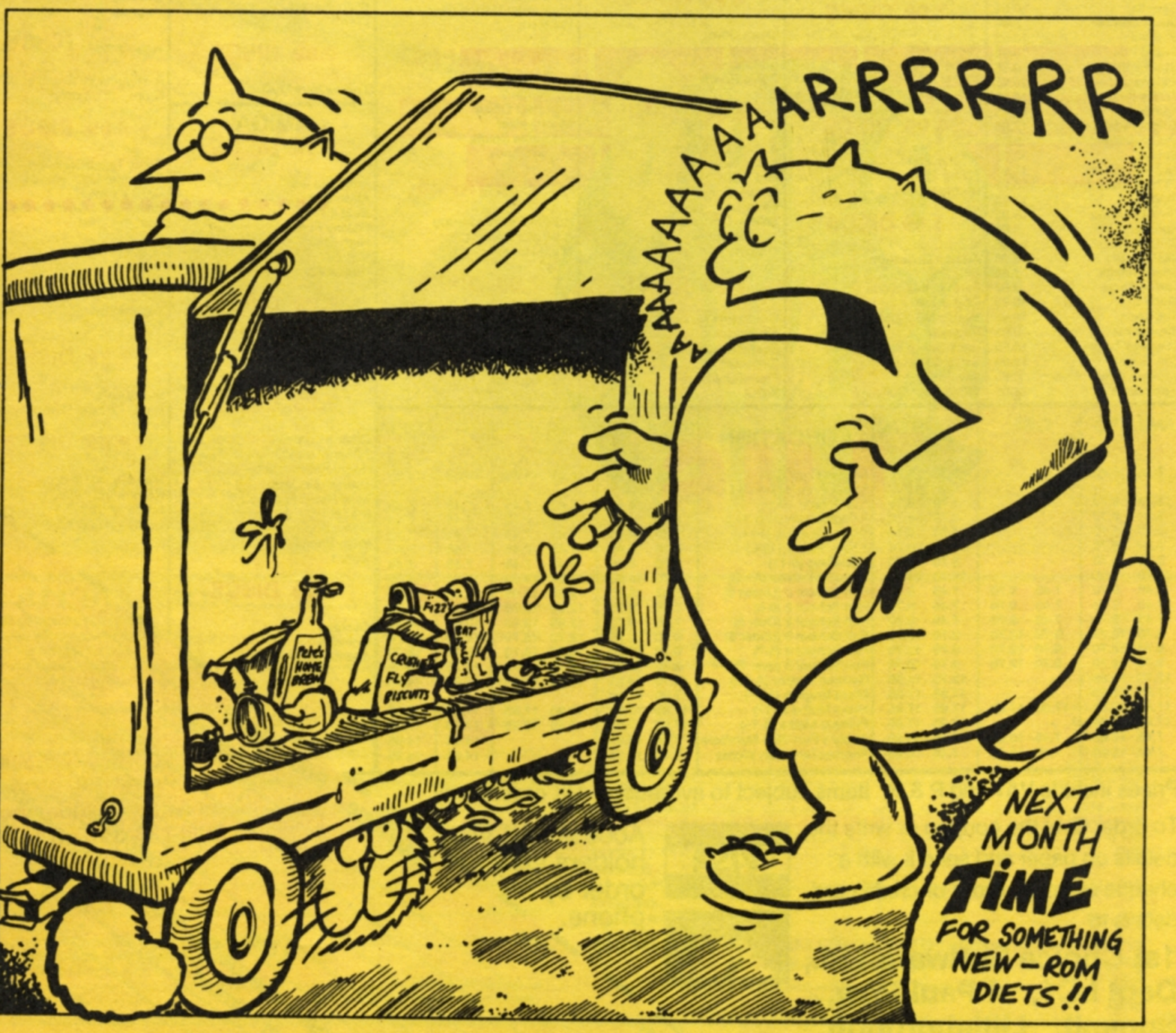
REPEATING SOMETHING UNTIL CONDITIONS ARE MET IS VERY USEFUL.
DOES IT HAVE TO BE ONE CONDITION?
SO WHERE'S HE STASHED IT THEN?
HMM...


NO, TRY THIS. TYPE NEW FIRST:
10 REPEAT
20 N=RND(50)
30 UNTIL N=1 OR N=50
40 PRINT N
HEY, JUST A MINUTE!
WHAT?

THAT LOOP STOPS IF N=EQUALS 1 OR 50. NOW ADD:
25 P=RND(10)
AND ALTER LINES 30 AND 40
30 UNTIL N=1 AND P=7
40 PRINT N, P
CONSPIRACY
THE LAUNDRY TROLLEY! SEARCH FOR A HIDDEN COMPARTMENT.
ARE YOU SURE?







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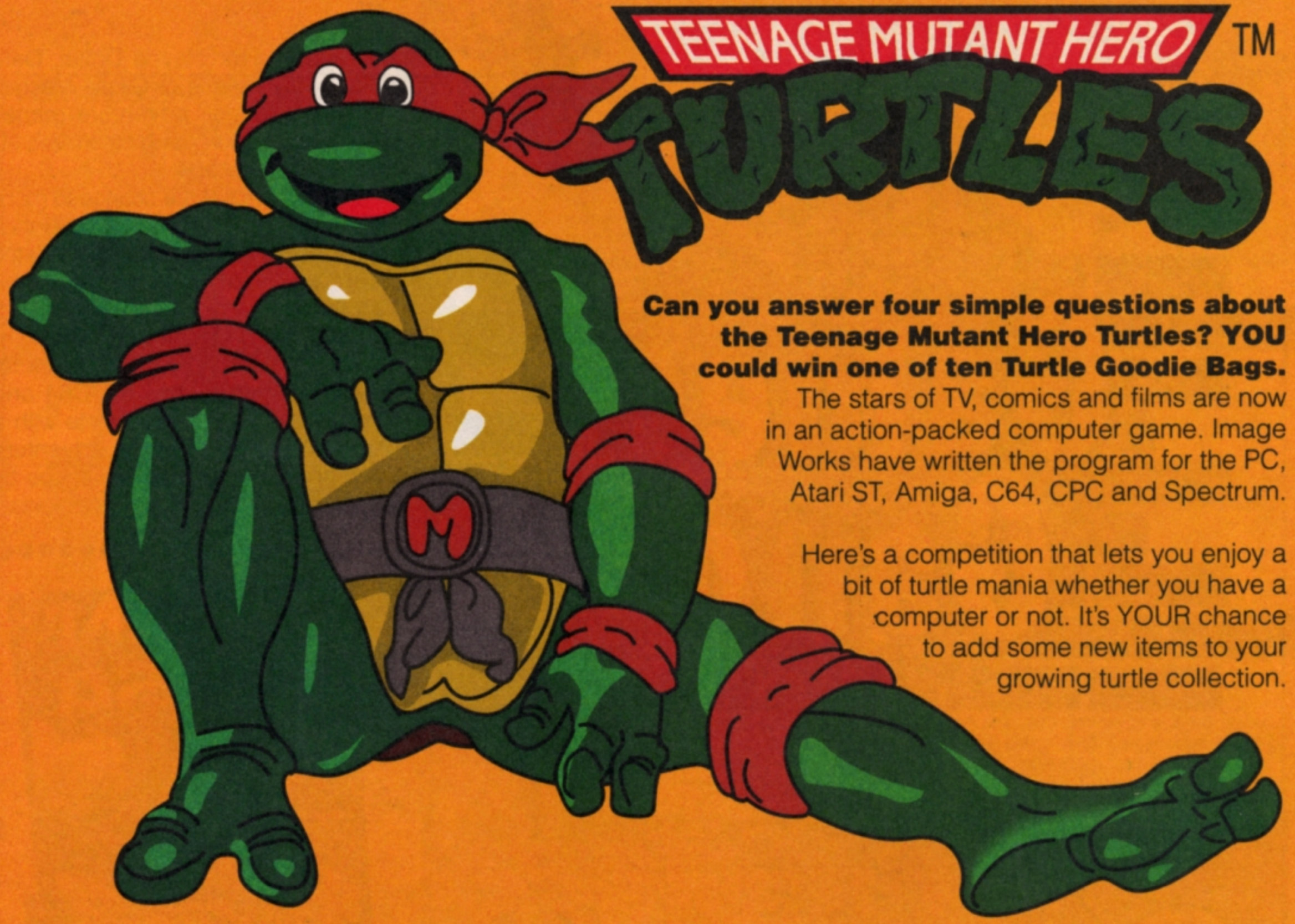

Can you answer four simple questions about the Teenage Mutant Hero Turtles? YOU could win one of ten Turtle Goodie Bags.

The stars of TV, comics and films are now in an action-packed computer game. Image Works have written the program for the PC, Atari ST, Amiga, C64, CPC and Spectrum.

Here's a competition that lets you enjoy a bit of turtle mania whether you have a computer or not. It's YOUR chance to add some new items to your growing turtle collection.

COMPETITION

The Goodie Bag

There will be TEN prizewinners. And each will get a different prize. Your own special Turtle Goodie Bag could contain a selection of:

- ★ **Teenage Mutant Hero Turtle Posters**
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And all you have to do is answer these four simple questions:

1. Name all the turtles
2. Who is their teacher?
3. What are their two human pals called?
4. Which gang does the Shredder lead?

Now fill in the entry form and make sure it arrives at *Let's Computer!* before January 31 1991.

The first 10 correct entries to pulled from the sack will each receive a goodie bag.

ENTRY FORM

Name.....

Address .....

.....

.....

.....Postcode.....Age.....

Answers

1 .....

2 .....

3 .....

4 .....

Send this entry form to: Turtle Contest, Let's Compute!, Europa House, Adlington Park, Macclesfield SK10 4NP.

The Games Gang

Hard Hat Simulator

Have you ever played Driller, Dark Side, Total Eclipse or Castle Master? All four of these adventure games were put together using Incentive's 3D system – Freescape.

Now you've got the chance to make the most of Freescape for yourself. **3D Construction Kit** gives you the best parts of Freescape 2, the advanced version. It allows you to create your own games.

The kit is published by Domark for the PC, Amiga, Atari ST, C64 and Spectrum. It comes complete with a specially written arcade adventure and should be in software shops by April.

Skatin' USA

Skatin' USA is new from Atlantis. It's a budget tape game that costs only £2.99 for the Amstrad CPC, Commodore 64/128 and Spectrum.

You play Superkid. You may have met him before. But now his special powers are replaced by a skateboard – well armed of course. He takes on the terrors of New York while showing off his skill.

Sticky Stuff

Stuck with an old-fashioned joystick? Feel like trading in your tired old model for a bigger, better deluxe version? Then why not check out Spectravideo's **Mega Board.**

This cream-coloured stick comes complete with two stop-watches. So now you can time your best scores.

It also has variable speed auto-fire and a slow-motion function. It costs £24.95.

Charlie's cheats!

Have you got a Spectrum or Amstrad version of **Impossamole**? Try pausing the game and hold down the keys M, O, L and E. You should get a full supply of energy!

Finding the C64 version of **Ghouls and Ghosts** just a bit too hard? Get to the high score table and type in WIGAN RLFC. You will then be able to press A to get your armour back. Or you can press S to skip the level.

Gavin Grindon from Middlesex, has been playing **Klax** hard over the past few months. He's come up with a simple cheat. By simply pressing 4 you'll find yourself on level 100.

Shanghai Warriors for the Spectrum now causes Jon Pound from Axbridge no problems. He's discovered what happens when he presses OUTLAND on the high score table and then restarts the game. He can now get himself out of a tight spot by pressing DELETE or CAPS SHIFT and 0.

Pam's Passwords

If you're stuck on **Pipemania** you'll be thankful for these passwords from Gavin Grindon in Middlesex:

Level	Password
4	Grip
8	Tick
12	Ooze
20	Blob
24	Ball
28	Wild

Though **Drop Ship** is only available for the Archimedes series, a lot of readers have sent in passwords. First in were the ones from Ben Bayliss:

Level	Password
4	Dahlia
7	Gaggle
10	Kaunda

Austin Barnes from Taverham, as well as James Brown from Maidenhead to name but two, have finished BBC's **Imogen**. Here are the passwords if you are struggling:

Level	Password
A	Ballonacy
B	Dripping-Stuff
C	See-Saw
D	Gnu-Problem
E	Whip-it
F	Saxaphobia
G	Down-and-out
H	Follow-me
I	Duck-egg-blues
J	Pavlov-was-here
K	Tender-hooks
L	Babboonacy
M	Applesource
N	Hamster-jam
O	Fire-works
P	Time-flies

Boobs from Taunton has four of the five passwords for Superior's **Richochet**. Can anyone come up with the fifth?

Level	Password
1	Richochet
2	Enigmatic
3	Spiritual
4	Supernova

Anything you can do, Turrican II

If you're a shoot-'em-up fan you'll probably still have blisters on your trigger finger from playing Turrican. It's Rainbow Arts' incredibly fast, mega-weapon, multi-directional blaster.

Well, start stocking up on the Elastoplast now: Turrican II is on its way.

It's designed by Manfred Trenz and developed – unusually – on the C64. It features Turrican pitted against five worlds packed with more aliens than you can shake a stick at. All the versions will be great – especially the 16 bit ones. They'll have 1,500 screens, 400k of sound, loads of speech samples and very impressive seven-layer scrolling.

If the fantastic first level demo is anything to go by it should be hot stuff – so start saving now!

Turrican II is due out in February for the Amiga, Atari ST, C64, Amstrad CPC and Spectrum.

Throwing down the Gauntlet

You've played Gauntlet. You've been stunned by Gauntlet 2. Now prepare yourself for **Gauntlet 3D**. The latest version of the four-player coin-op features the four original characters. And there are four newcomers: Lizardman, Iceman, Neptune and Rockman.

There's also full 8-way scrolling isometric 3D. That looks as good as it sounds! It's pretty hard to achieve – the programmers have done well.

There are loads of new monsters, magic objects, potions and puzzles. And eight totally original levels. But because all this needs a lot of memory, no more than two players can take part.

Gauntlet 3D is expected next spring on all major formats except Archimedes, BBC Micro and Electron.

If you've any hints, pokes or cheats you'd like us to print send them to at: *Let's Compute!* Europa House, Adlington Park, Macclesfield SK10 4NP.

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```
1000 REM ===== Load cards =====
1010 PRINT "Load a box of cards"
1020 PRINT "--------------------"
1030 PRINT
1040 INPUT "What is its name";F$
1050 IF F$="" THEN RETURN
1060 ZZ=OPENIN F$
1070 FOR X=1 TO 255
1080 INPUT#ZZ,C$(X)
1090 NEXT X
1100 CLOSE #ZZ
1110 RETURN
2000 REM ===== Save cards =====
2010 PRINT "Save a box of cards"
2020 PRINT "--------------------"
2030 PRINT
2040 INPUT "What is its name";F$
2050 IF F$="" THEN RETURN
2060 ZZ=OPENOUT F$
2070 FOR X=1 TO 255
2080 PRINT#ZZ,C$(X)
2090 NEXT X
2100 CLOSE #ZZ
2110 RETURN
```

This program works on all home micros

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes

The program will work as shown

Atari ST(Stos) AMIGA (Amos)

Change the following lines:

```
1060 OPEN IN #1,F$
1080 INPUT#1,C$(X)
1100 CLOSE #1
2060 OPEN OUT #1,F$
2080 PRINT#1,C$(X)
2100 CLOSE #1
```

Commodore 64/128

Change the following lines:

```
1060 OPEN 1,1,0,F$
1080 INPUT#1,C$(X)
1100 CLOSE 1
2060 OPEN 1,1,1,F$
2080 PRINT#1,C$(X)
2100 CLOSE 1
```

Spectrum

Leave out Lines 1070 to 1100 and Lines 2070 to 2100
Change the following lines:

```
1060 LOAD F$ DATA C$()
2060 SAVE F$ DATA C$()
```

PC(GW-Basic)

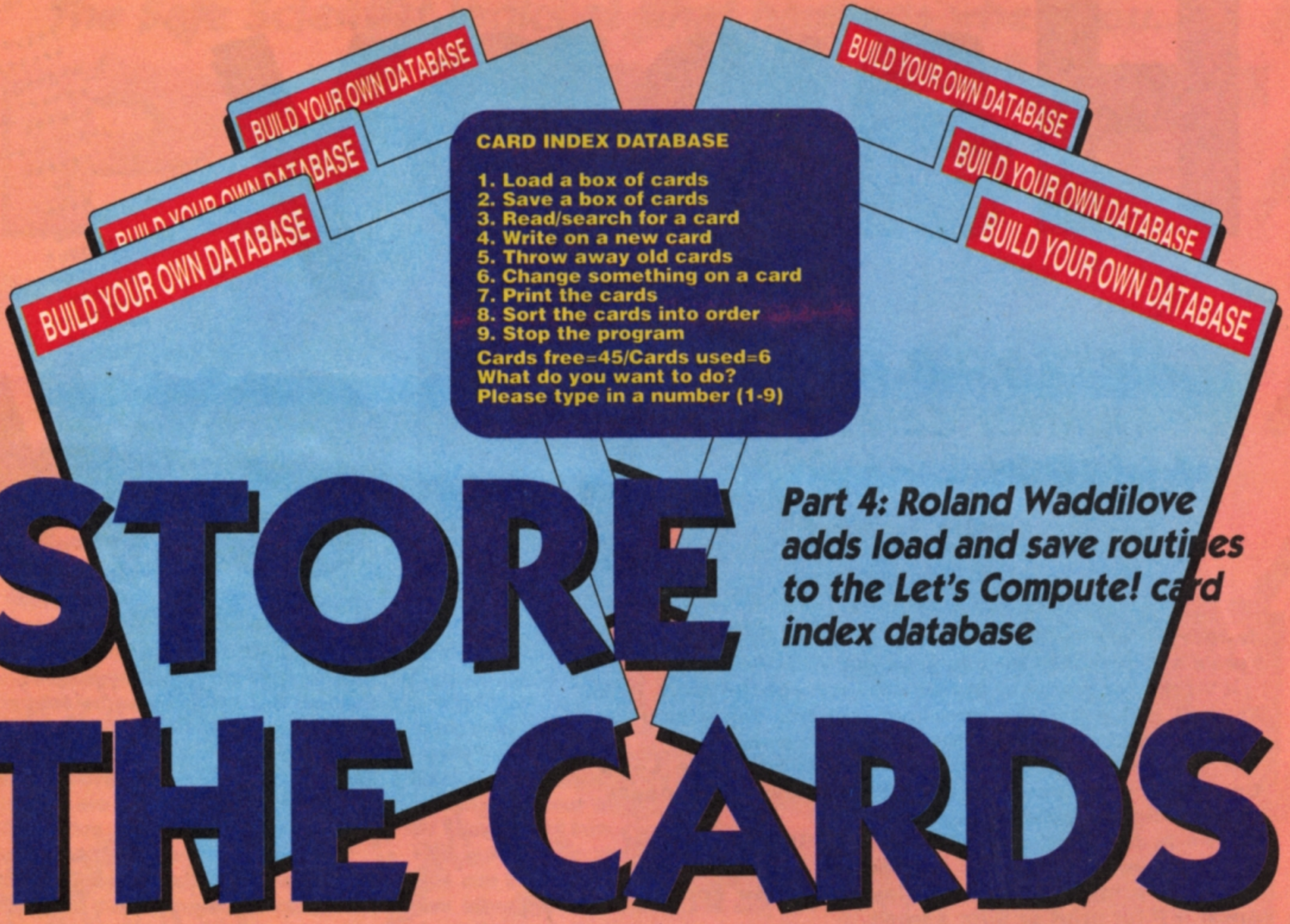
Change the following lines:

```
1060 OPEN F$ FOR INPUT AS #1
1080 INPUT#1,C$(X)
1100 CLOSE #1
2060 OPEN F$ FOR OUTPUT AS #1
2080 PRINT#1,C$(X)
2100 CLOSE #1
```

Amstrad CPC

Change the following lines:

```
1060 OPENIN F$
1080 INPUT #9,C$(X)
1100 CLOSEIN
2060 OPENOUT F$
2080 WRITE #1,C$(X)
2100 CLOSEOUT
```



STORE THE CARDS

Part 4: Roland Waddilove adds load and save routines to the Let's Compute! card index database

In the last two issues of *Let's Compute!* we've built a simple database that lets us type in facts like phone numbers. The first article showed how the menu was made and last month you were given the part of the program that lets you write on the blank cards.

The problem now is that every time you want to use the database you have to type in the data all over again! It disappears every time you switch your computer off.

So this month's code makes your computer remember the facts and figures on the cards. You will be able to save them to tape or disc.

You need to add these two routines to the parts we've done already. So start by LOADing the program you ended up with last month.

Next you should type in the new lines. Then SAVE your program and try RUNning it.

You can now try choices 1, 2, 4 and 5 on the menu – see above. What you've got now is a useful way of storing facts. But there's much more to a database than that.

We'll add more next month.

How the Load and Save routines work

You need two separate routines. One to save the cards and one to load them back any time you want to use them.

They are in Lines 1000 to 2110. Both are designed in a similar way. The only difference is that Load Cards reads the information in from tape or disc, and Save Cards writes it out.

Remember, the data is stored in the computer's memory in 255 strings called C$(1) to C$(255). On most computers, before you save these strings you need to open a file for output. Take a look at Line 2060.

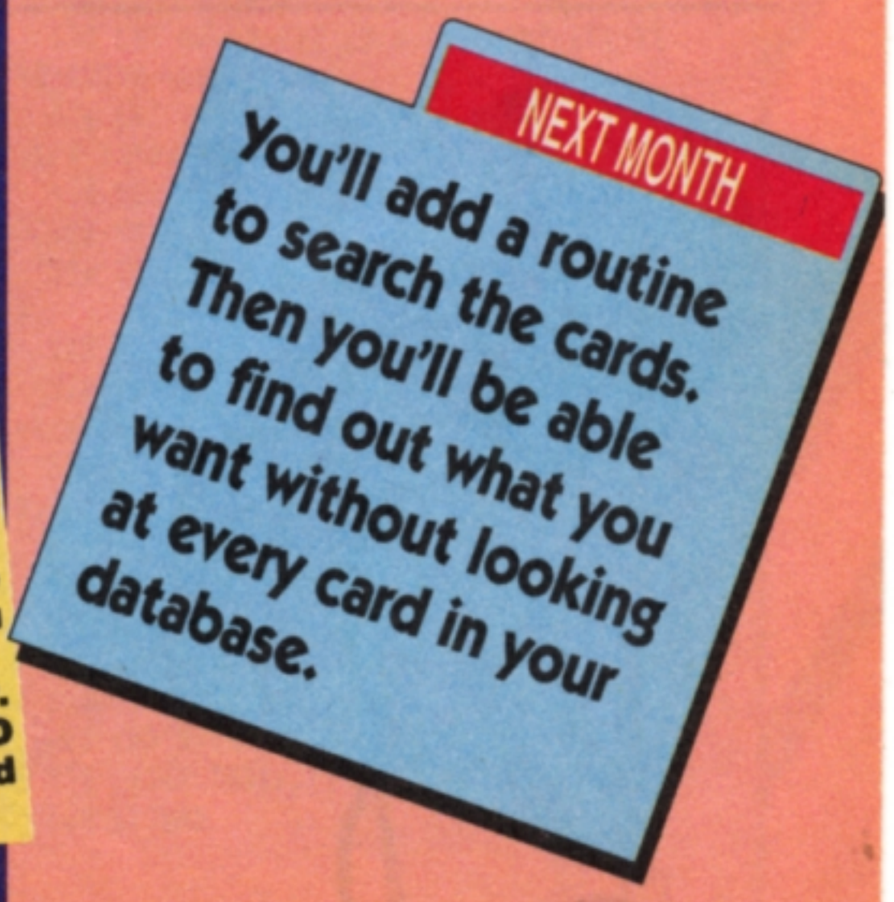
We then use PRINT# to print the strings to tape or disc – Line 2080. This special form of the PRINT command is different to the one you usually use. Nothing shows on the computer's display. It sends a message to the tape or disc instead.

When all the strings have been printed using a simple FOR ... NEXT loop the file has to be closed – line 2100.

In the Load Cards routine the data file is opened for input in Line 1060. A FOR ... NEXT loop loads the 255 strings making up the cards using INPUT# in Line 1080.

As you may know, INPUT makes the computer stop and wait for you to type in something. But INPUT# is different. It reads the cassette tape or disc instead of the keyboard – you won't see anything on the screen.

The Spectrum works differently. You just use special forms of LOAD and SAVE. Look at Lines 1060 and 2060.



Happy New

Make your own computer calendar for 1991 – or any year you want

January 1 is the time to hang up your new calendar. So here's a program to let you print out your own.

It works for any year in this century – or the next. If you haven't got a printer, you can still use the electronic calendar and view the dates on your screen.

If you don't like the picture of Mabel – the Let's Compute! cat – you can design your own. The panel below tells you what to do.

Type in the program. SAVE it and RUN it. The first question you'll be asked is whether you want your calendar printed or just displayed on your screen. Answer P for print or S for screen.

Next, you're asked for the year. A good reply is 1991.

If you answered P to the first question your calendar will then be printed. If you chose a screen version, the cat will be displayed.

Press any key to see the first part of the calendar. There will be a slight pause while your computer works a few things out. Then the first few months will be displayed.

To see more, press a key again. (There will be no messages telling you to press a key. Just take our word for it!)

That's all there is to printing or viewing your own calendar.

If you've got a printer why not print out lots and give them to your friends?

How to change the program

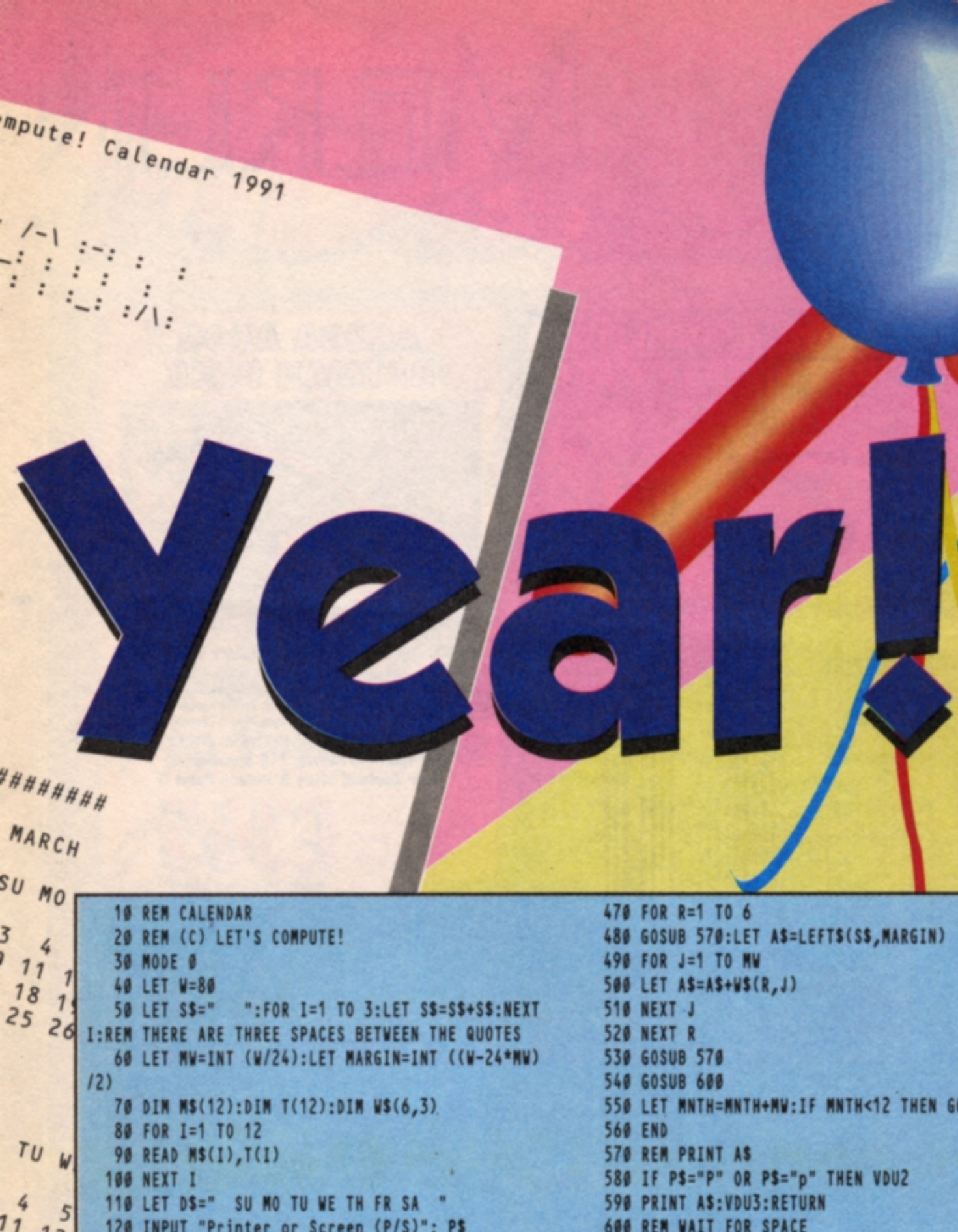
Line 40 sets the width of the printout. At the moment it is set to the number of letters that will fit across the screen of your computer.

If you want to print the calendar – and you have a printer that lets you have more letters on each line – you can change it. When you RUN the program, what you see on your screen will be messed up, but the printout will be just what you wanted.

The picture of Mabel is designed to fit on all common printers. It's 32 letters wide so it fits on the smallest computer screen or paper. If it's printed 80 letters wide the whole calendar will be 66 lines long – which is the most common paper size.

Would you like to put your own picture on the calendar? Design it using letters on your keyboard and put them in Lines 770 to 1000. If you use more than 32 letters in any line, change the number 32 in Line 150 to the most you use.

You can make the picture as tall as you want. Just put more DATA lines near the end of the program. Make sure that you keep **DATA "end"** as the last line.



Year!

```
   10 REM CALENDAR
   20 REM (C) LET'S COMPUTE!
   30 MODE 0
   40 LET W=80
   50 LET S$="   ":FOR I=1 TO 3:LET S$=S$+S$:NEXT
I:REM THERE ARE THREE SPACES BETWEEN THE QUOTES
   60 LET MW=INT (W/24):LET MARGIN=INT ((W-24*MW)
/2)
   70 DIM M$(12):DIM T(12):DIM W$(6,3)
   80 FOR I=1 TO 12
   90 READ M$(I),T(I)
  100 NEXT I
  110 LET D$="  SU MO TU WE TH FR SA  "
  120 INPUT "Printer or Screen (P/S)"; P$
  130 INPUT "What year "; YEAR
  140 CLS
  150 LET B$="":IF W>33 THEN LET B$=LEFT$(S$,INT
((W-32)/2))
  160 LET A$=B$+"The Let's Compute! Calendar "+ST
R$(YEAR)
  170 GOSUB 570
  180 LET A$=" ":GOSUB 570
  190 READ A$:IF A$<>"end" THEN LET A$=B$+A$:GOSU
B 570:GOTO 190
  200 GOSUB 600
  210 LET T(2)=28
  220 LET Y4=INT (YEAR/4):LET SD=YEAR+Y4-7*INT ((
YEAR+Y4)/7)
  230 IF YEAR=4*Y4 THEN LET SD=SD-1:LET T(2)=29
  240 LET X=(SD-1)*3+1
  250 IF SD<=0 THEN LET X=X+21
  260 LET MNTH=0
  270 REM
  280 FOR J=1 TO MW
  290 LET R=1
  300 LET X$=LEFT$(S$,X)
  310 FOR I=1 TO T(MNTH+J)
  320 LET T=INT (I/10)
  330 LET U=I-10*T+48:LET T=T+48
  340 IF T=48 THEN LET T=32
  350 LET X$=X$+" "+CHR$(T)+CHR$(U)
  360 LET SD=(SD+1)
  370 LET X=(X+3)
  380 IF X>21 THEN LET X=1:LET
W$(R,J)=LEFT$(X$+S$,24):LET R=R+1:LET X$=" "
  390 NEXT I
  400 LET W$(R,J)=LEFT$(X$+S$,24)
  410 LET R=R+1:IF R<7 THEN LET W$(R,J)=S$:GOTO410
  420 NEXT J
  430 LET A$=" ":GOSUB 570:LET A$=LEFT$(S$,MARGIN)
  440 FOR J=1 TO MW:LET A$=A$+LEFT$("  "+M$(MNTH+J
)+S$,24):NEXT J
  450 GOSUB 570:LET A$=" ":GOSUB 570:LET
A$=LEFT$(S$,MARGIN)
  460 FOR J=1 TO MW:LET A$=A$+D$:NEXT J
  470 FOR R=1 TO 6
  480 GOSUB 570:LET A$=LEFT$(S$,MARGIN)
  490 FOR J=1 TO MW
  500 LET A$=A$+W$(R,J)
  510 NEXT J
  520 NEXT R
  530 GOSUB 570
  540 GOSUB 600
  550 LET MNTH=MNTH+MW:IF MNTH<12 THEN GOTO 270
  560 END
  570 REM PRINT A$
  580 IF P$="P" OR P$="p" THEN VDU2
  590 PRINT A$:VDU3:RETURN
  600 REM WAIT FOR SPACE
  610 IF P$="P" OR P$="p" THEN RETURN
  620 AA=GET
  630 RETURN
  640 REM MONTH  DATA
  650 DATA "JANUARY",31
  660 DATA "FEBRUARY",28
  670 DATA "MARCH",31
  680 DATA "APRIL",30
  690 DATA "MAY",31
  700 DATA "JUNE",30
  710 DATA "JULY",31
  720 DATA "AUGUST",31
  730 DATA "SEPTEMBER",30
  740 DATA "OCTOBER",31
  750 DATA "NOVEMBER",30
  760 DATA "DECEMBER",31
  770 DATA"   /*\/*\"
  780 DATA"   ******"
  790 DATA"\_**0**0**_/ :\/: : /-\ :-: :  :"
  800 DATA"__***<>***__ :  : : :_: : : :  :"
  810 DATA"  * **** *   :  : : : : :_: :/\:"
  820 DATA" /**    **\"
  830 DATA"   ******"
  840 DATA"     **"
  850 DATA"    ****"
  860 DATA"   *oooo*"
  870 DATA"   *oooo*"
  880 DATA"  *oooooo*"
  890 DATA"  **oooo**      *"
  900 DATA"  ***oo***     ***"
  910 DATA"  ********     @@@"
  920 DATA" **==oo==**    ***"
  930 DATA" **==oo==**    @@@"
  940 DATA" **==oo==**    ***"
  950 DATA" **==oo==**    @@@"
  960 DATA" **==oo==**   @**"
  970 DATA"***==oo==**@*@*@"
  980 DATA"***==oo==**@*@*"
  990 DATA" **nnnnnn**"
 1000 DATA"####################################"
 1010 DATA"end"
```

IS THIS YOUR COMPUTER?

Spectrum

Change the following lines:

```
  30 CLS
  40 LET W=32
  70 DIM M$(12,22):DIM T(12):DIM W$(6,3,24)
 150 LET B$="":IF W>33 THEN LET B$=S$( TO I
NT((W-32)/2))
 190 READ A$:IF A$( TO 3)<>"end" THEN LET A
$=B$+A$:GOSUB 570:GOTO 190
 300 LET X$=S$( TO X)
 380 IF X>21 THEN LET X=1: LET W$(R,J)=X$:
LET R=R+1: LET X$=" "
 400 LET W$(R,J)=X$
 430 LET A$=" ":GOSUB 570:LET A$=S$( TO MAR
GIN)
 440 FOR J=1 TO MW:LET A$=A$+"  "+M$(MNTH+J
):NEXT J
 450 GOSUB 570:LET A$=" ":GOSUB 570:LET A$=
S$( TO MARGIN)
 480 GOSUB 570:LET A$=S$( TO MARGIN)
 560 STOP
 580 IF P$="P" OR P$="p" THEN LPRINT A$:  R
ETURN
 590 PRINT A$:RETURN
 620 PAUSE 0
```

Amstrad CPC

Change the following lines:

```
  30 MODE 2
 580 IF P$="P" OR P$="p" THEN PRINT#8,A$:RE
TURN
 590 PRINT A$:RETURN
 620 WHILE INKEY$="":WEND
```

Commodore 64/128

Change or add the following lines:

```
  30 PRINT CHR$(147);
  40 LET W=40:REM CHANGE TO 80 FOR PRINTER
 125 IF P$="P" OR P$="p" THEN OPEN 4,4
 140 PRINT CHR$(147);
 555 IF P$="P" OR P$="p" THEN PRINT#4:CLOSE#4
 580 IF P$="P" OR P$="p" THEN PRINT#4,A$
 590 PRINT A$:RETURN
 620 GET AA
```

PC(GW BASIC)

Leave out Lines 930 and 940.
Change the following lines:

```
  30 SCREEN 1:CLS
 580 IF P$="P" OR P$="p" THEN LPRINT A$
 590 PRINT A$:RETURN
 620 WHILE INKEY$="":WEND
```

Atari ST (Stos)/Amiga (Amos)

Change the following lines:

```
  30 MODE 1:KEY OFF:CURS OFF:HIDE
 580 IF P$="P" OR P$="p" THEN LPRINT A$
 590 PRINT A$:RETURN
 620 WHILE INKEY$="":WEND
```

For Amiga use:

```
  30 MODE 1:CURS OFF:HIDE
```

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LET'S MAKE MONEY!

Part 2

Sign here!

Here's a great fund-raising idea that's well worth signing up

Everyone wants to know what's likely to happen to them in the future. And there are lots of ways that claim to predict it.

Horoscopes, Tarot cards and studying handwriting are just a few of them. There are experts in all these fields. You can hire them to make money at your fund-raising event.

Of course if you do that you have to pay the person to do the job. *But if you use your computer it costs you nothing!*

The idea is simple. Sell people a printout of the predictions.

This month we'll look at how a school made money at a fair by analysing signatures. It takes about five minutes for each signature. So, selling printouts for 50p, they made almost £20 in three hours.

They also had lots of fun and laughs. It was easily one of the highlights of the afternoon.

What exactly did they do? And how much did they have to spend before they got started?

The software they used is called Handwriter Analysis. It's for the PC and is on a Shareware disc called Personalities. You can get a copy for £2.50 from Shareware Marketing (0297 24088).

A PC and printer were set up at the fair and the program was run. It asks 13 questions about a person's signature.

The questions are all simple to answer. For example, is the signature underlined?

The person running the stall just asks the customer to sign a bit of paper and then tells the computer the facts. It's a good idea to practise a few before trying it out at a fair.

You can get extra help about any question by typing **H** for help. Look at these help screens on your test runs. When you do it for real you'll appear professional and won't need any more help.

Once all the questions have been answered, you can get a printout like the ones shown below. You can then sell them to the amazed customer.

That's all there is to making a few pounds at your next fund-raising event. Try it. It's great fun too.

What is Shareware?

The person who writes a program is its owner. In other words, the author owns the copyright.

Some authors say they don't mind people having their programs for free. That's called **Public Domain** software.

Once you have it you can give it to anyone you want. But you shouldn't sell it for a profit.

You can buy Public Domain software. That may sound silly after what we've just said. But what you're buying is the disc it's on, and paying for things like post and packing.

Shareware is often mixed up with PD. But it's not the same thing. If you like the program when you've tried it you are asked to pay a small charge.

The program itself tells you where to send the money. If you do this and pay more you'll receive extras.

Sometimes the program you get at first is a cut-down one. If you pay up you'll get the lot. This could include the full manual. Some companies send you free updates if they change the program.

Ram

```
Handwriting Analyst Report for Ram  on 11-30-1990
     Copyright 1986, 1988 by Ciasa, Berkeley, California
This report is based only on Ram 's signature and therefore
describes the way he wants others to see him.  This may not be the
way he really is. Physical & Material Drives
Ram has a zestful attitude with a lot of vitality.
He eagerly seeks physical and material pleasures.  He can be
thrifty.
```

Rom

```
Handwriting Analyst Report for  Rom  on 11-30-1990
     Copyright 1986, 1988 by Ciasa, Berkeley, California
This report is based only on Rom 's signature and therefore
describes the way he wants others to see him.  This may not be the
way he really is.

Physical & Material Drives
Rom can be thrifty.
----------------------------------------------------------------

Intellectual Style
Rom is more intuitive than he is logical.
```

It's time to STORE

The listings in *Let's Compute!* are quite short and very easy to type in. Even so, once your program is working you don't want to have to key it in every time you want to use it.

So you need to save it on a tape or disc. It's then ready to load again anytime you like.

Tapes and discs are two ways of storing computer programs and data. They're called backing stores.

As we've said over the last few months, computers work in binary numbers. And it's easy to record these on a tape.

The numbers can be shown by either a short beep or a slight gap. If you play the tape from a computer on a normal cassette player you hear a high pitched whistle. But if you have a recorder that can let you play it slowly you'll clearly hear the beeps and gaps.

Discs are recorded in a similar way. The information is stored on a flat magnetic surface made of a similar material as a tape.

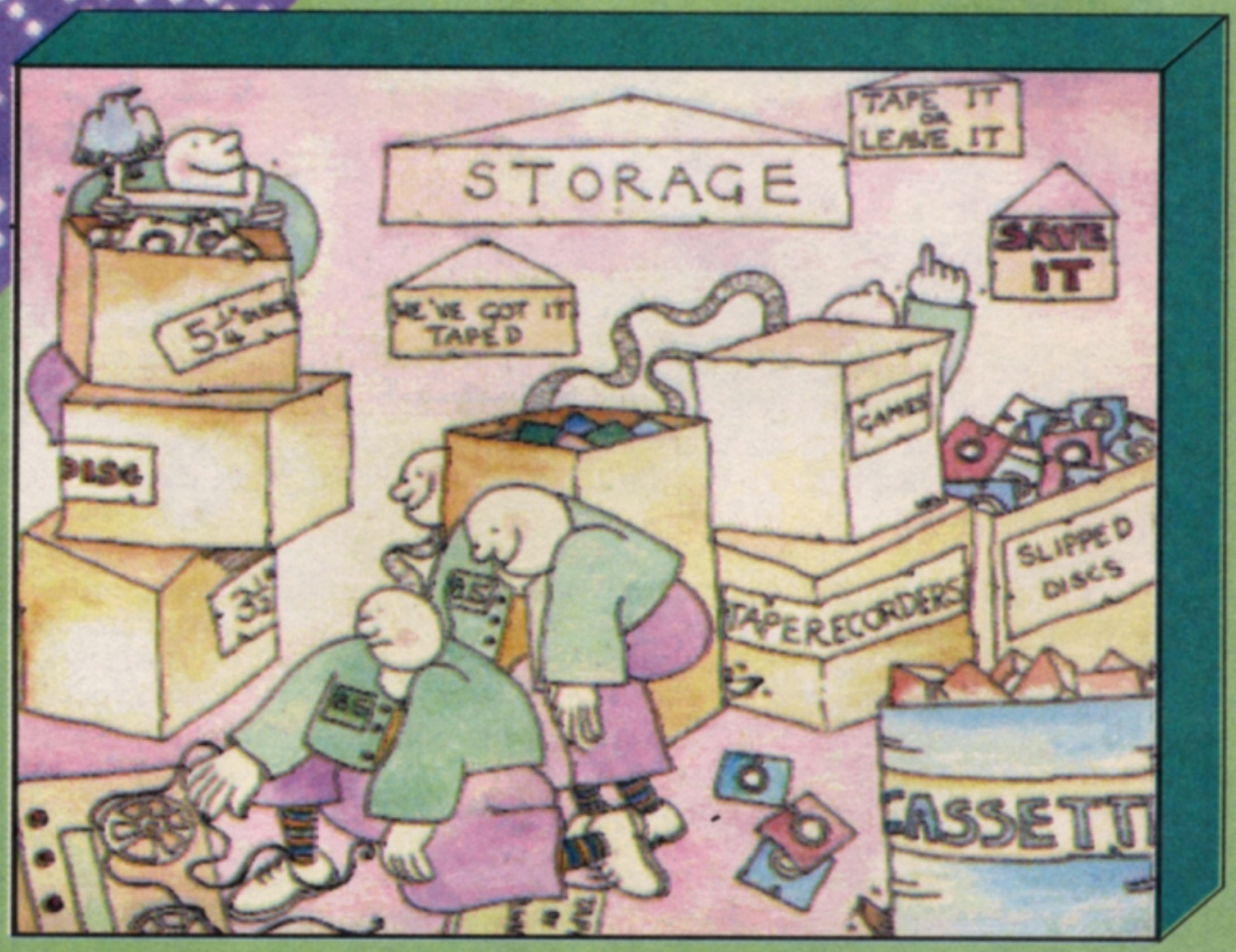
The data is stored in ever-widening circles on the disc – like ripples in a pond. Formatting the disc prepares these circles.

Discs spin round very quickly – much faster than tapes. That's why discs take less time to load programs than tapes.

Another advantage is that the read/write head – which collects the data – can move straight to a circle on the disc. Which makes it very quick to find a program. With tape, the head stays still and a lot of tape may have to pass it until your program is found.

These are just two forms of storage device. There are lots of others.

On office computers paper tape used to be a common form of backing store. The binary numbers are recorded by holes punched in the tape.



Paper tape is rare on computers these days. But the background to this page shows what it looks like. You can clearly see the holes that translate into binary numbers.

You'll see that each row has up to eight holes. There's also a line of smaller holes – these are just there so the machine can pull the tape through.

Using just seven of each row of eight holes you can show 127 different binary numbers. That's more than enough for the numbers 0 to 9, letters a to z and letters A to Z.

The eighth hole has a special use. The computer uses it to test whether everything has been read correctly.

Moving from the past to the present – and future – another way of storage that is becoming more popular is the CD rom. For home computers, these are still rather expensive. They are only used for reading – the word ROM stands for Read Only Memory.

They work in the same way as a normal CD player: A laser light is used to read the zeros and ones.

Optical disc drives work in a similar way but you can also record on them.

The discs have a surface that looks like a CD.

The big advantage of optical discs is that you can store much more on one disc. They're also less likely to get damaged.

But they're still very expensive and not used on home computers yet. It won't be long before they

HOW A COMPUTER WORKS

Part 5

BINARY BITS

Last month we saw how easy it is to add two numbers in Binary. For similar reasons it's also easy to take away in binary.

What about multiplication and division? The simple answer is that a computer can't do them.

But, as multiplication is really only repeated addition, it gives the impression that it can. If you ask a computer to do 4x7 it will work out 7+7+7+7.

For division, a computer sees how many times it can take away. For example, if you ask it to work out 21÷7 it it starts subtracting, like this: 21-7=14, 14-7=7, 7-7=0. That means that 7 can be taken from 21 three times so 21÷7=3.

All these processes are easier in binary because there are only two numbers to worry about. So, why don't we use binary in our everyday life?

The answer is that binary numbers are too long for humans to work with. Look at the same sum done in both decimal and binary:

Decimal	Binary
45	101101
67	1000011
112	1110000

But there is an in-between way? It's called hexadecimal or Base 16.

That means that, instead of using ten numbers (0 to 9) we use 16. The numbers 10 to 15 are represented by the letters A to F.

In hexadecimal, instead of 45 meaning 4 Tens and 5 Units, it represents 4 Sixteens and 5 Units (that's 69 in decimal)

Some computer books put & in front of the numbers to show they're in hexadecimal. Others put $. So, what decimal number does &BC represent?

The letter B is 11 and C is 12. That means &BC is 11 Sixteens and 12 Units. That's 188 in decimal. Hexadecimal numbers are even shorter than decimal.

Why did we say that hexadecimal is an in-between way? Why do computer experts use it?

The main reason is that it's very easy to convert between binary and hexadecimal.

The digits making up the binary number are called bits (BInary digITS). All you do is group the bits in fours starting at the right. It doesn't matter if there are less than four in the last group. Then convert each set into a hexadecimal number alone.

So 1011101 splits to 101 and 1101. Then 101 is 5 and 1101 is D.

This means that 1011101 in binary converts to &5D.

So while computers work in binary, programmers think in hexadecimal. It's then easy to convert between the two systems.

LET'S COMPUTE! PRIZE WINNERS

Our mailbags have been packed with entries to November's Win a Disc Drive contest. Well done everyone who got the right answers!

The first four entries to be pulled from our sack were: ***C Markwell, Ipswich; Matthew Anderson, Dorchester; Chris Williams, Elworth and A McNeil from Shieldaig.*** Each will be receiving a Cumana disc drive for their computer.

In case you're wondering what the right answers are, they're here:

What does MSdos stand for?
Microsoft Disc Operating System

Why are keyboards know as Qwerty?
They are the first six letters on a keyboard

Which country did Atari and Commodore start?
USA

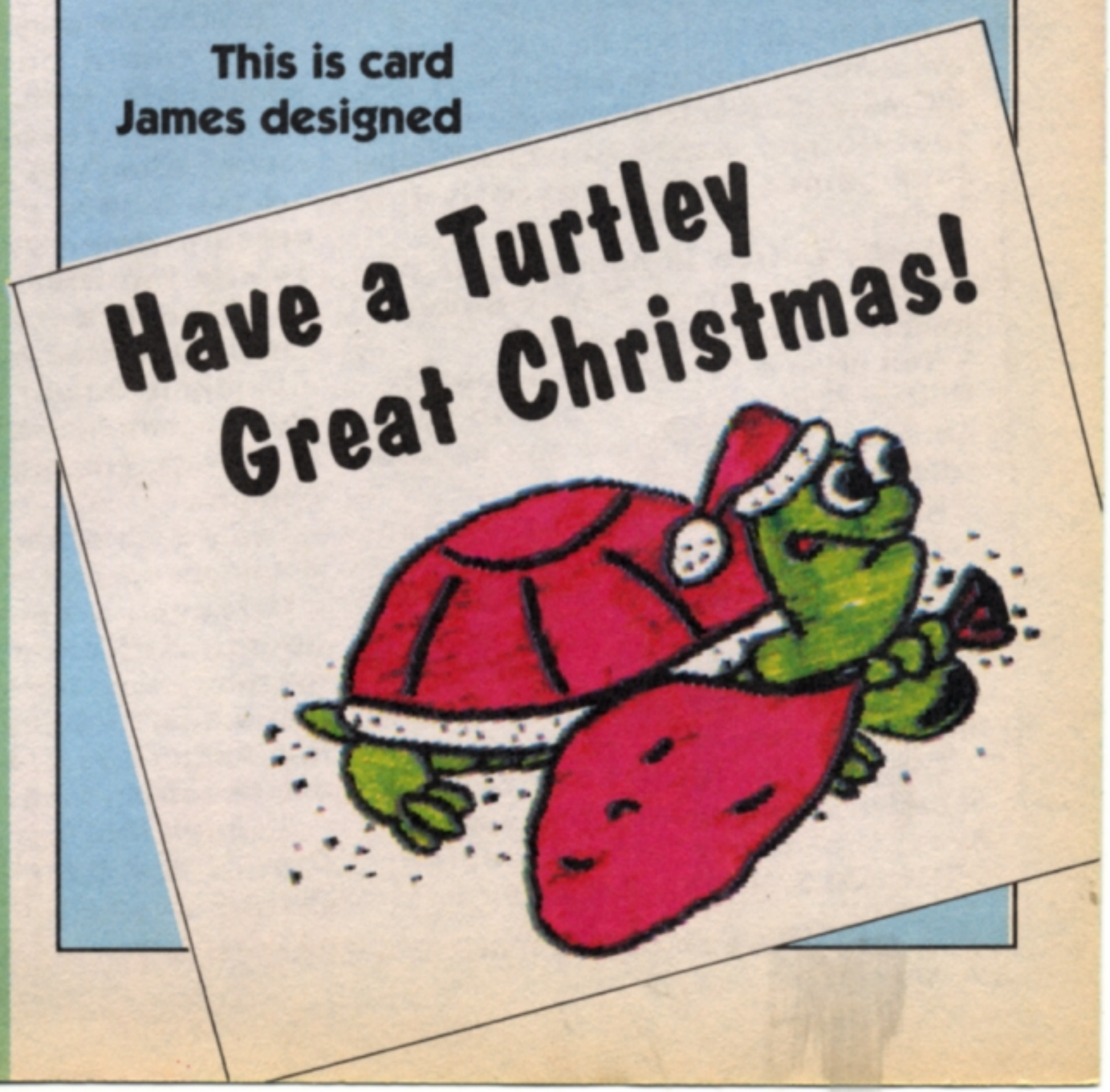
IBM has a nickname. Which one is it?
The Big Blue

Each letter in the Word Basic stands for a word. What are they?
Beginners All-purpose Symbolic Instruction Code

Also in the November issue of *Let's Compute!* we asked you to create your ideal Christmas Card. It was very hard to choose between the many superb and artistic entries we were sent.

Our team of judges decided that the prize of 50 Christmas cards should go to ***James Jagger (12), from Welton, Lincoln.***

This is card James designed



Round-up Roundup

The Let's Compute! expert takes a break from Basic and looks at the top games

Shadow of

When Psygnos is released Shadow of the Beast a year ago it made people look at the Amiga in a new light. At last they've now converted the game to the Atari ST. And I'm pleased to say that it's hardly suffered.

At the same time Gremlin have also released Beast for the Spectrum, C64 and Amstrad CPC.

The gameplay is very similar for all computers. But obviously the graphics change for each machine.

The ST version is very similar to the Amiga one. There are fewer colours, but it still has the lovely parallax scrolling. That's where different parts of the screen scroll at different

Wheels of fire

Here's a brand new compilation from Domark. It's called Wheels of Fire and features, suprisingly enough, a collection of four racing games.

Domark have only ever released one racing game themselves. It's called Hard Drivin' and is one of the four.

The other games are Turbo Outrun from US Gold, Chase HQ from Ocean and Power Drift from Activision.

Despite all the games being based on some kind of car racing they are all quite different. And a good thing too! No one wants to pay £30 for four games that are exactly the same.

Turbo Outrun is named after the infamous Outrun. But it doesn't resemble the original at all.

You drive a Ferrari F40 across the United States. The idea is to bash other cars off the road and have a wild time.

Nice graphics and some good sound tracks help the game along. But I prefer the next one the list: Chase HQ.

This has another nice simple plot. Drive along as fast as you can on the lookout for criminals.

They're not that hard to find because a huge great arrow appears over the top of them saying: CRIMINALS HERE! When you spot one you simply smash your car into the side of him. With plenty of levels and even better graphics this is my favourite of the four.

It's just so addictive! Lots of speech too, which helps no end.

Next is Hard Drivin', which differs from the first two completely. This is more of a car simulation. It features solid 3D shapes.

There's no plot as such. You just drive round one of two tracks against the clock.

The best feature is the action replay. When you drive too fast off a broken bridge you get to see an outside view your crash. Superb! This is the first time Hard Drivin' been seen on the C64. It was specially written for this package.

Lastly is Power Drift. This was a big success in the arcades because of its huge graphics and great sound effects.

Sadly both of these are gone from the home computer versions.

It leaves a severely cut down game. Still good fun, but really overshadowed by the other three.

The cost? £29.99 for the Atari St and Amiga and £14.99 for CPC, C64 and Spectrum tapes.

All in all this is a superb package. One of the best I've seen from Domark.

Turbo Outrun

Hard Drivin'

Chase HQ

the Beast

speeds to give the feeling of depth. However on all versions there is one vital element missing – the all important gameplay! Beautiful it may be, but it's also very very boring.

You get killed too easily. Or is it because I'm useless? There's far too little action for my money.

The 8 bit machine versions don't even have enough sound or graphics. They really aren't worth the money.

The ST version (Psygnosis) costs £24.95. C64, Spectrum, and Amstrad (Gremlin) are £9.95.

Atari ST owners can buy it for a great demo of their machine. But other than that I wouldn't bother.

Gold of the Aztecs

There are some very impressive technical bits and bobs in Gold of the Aztecs. It's from US Gold and there are versions for the Atari ST, Amiga and PC.

You play the hero. And there more than 1,500 frames of animation, over 600k of music and it's all taken three man years to write. Blimey!

You are Bret Conrad, bored penniless. By some stroke of fortune you have found a map of an ancient Aztec temple. It's filled with gold. So off you trot to find all this lovely wealth.

But everything you see on screen is out to stop you. Gold of the Aztecs is a hack and slash of the best kind. There's plenty of action and a bit of thought too.

The graphics are good but, most importantly, the gameplay is great. It's a first rate game and should do well.

Gold of Aztecs costs £24.95 for the Atari St, Amiga and PC.

Plotting

Are you keen on strategy? Then take a look at Plotting from Ocean.

You and a friend play against each other. You can also challenge your computer – but it's your friend too, isn't it?.

The object is ever so simple: Just get rid of a few blocks lying around the screen.

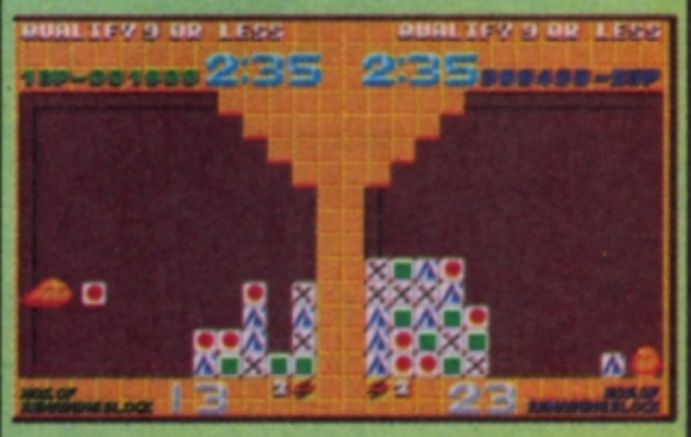
But the way to do this is really devious. Moving one block throws another at you. But bashing that block may get rid of five others.

It's all good clean fun. And there are lots of lovely backdrops and great effects too.

There is an added bonus on some computers. A screen editor is included to let you design your own series of blocks.

You can get Plotting for the Spectrum, C64, Amstrad CPC, Atari ST and Amiga. It's £9.99 for 8 bit tape, £14.99 for disc, and £24.95 for the Atari ST or Amiga.

Plotting is well worth the money because you'll always be in the mood for a game. Provided your blood pressure can stand it!



Pendown is already a favourite writing tool in schools across the country. Now it has been completely redesigned to take full advantage of all the facilities that make the Archimedes (A3000) so popular. It features a powerful dictionary, thesaurus and spell checker, along with a friendly user-interface that can be reconfigured to make as much sense to a six-year-old as it does to an adult. Special fonts, simplified layouts and on-screen help make it perfect for the very young, whilst powerful word-processing features mean it is equally at home with students working on 'A' Level projects.

make Words make Sense

Longman Logotron has a wealth of experience in producing educational software, and also produces the National Curriculum standard Logotron Logo, Numerator – a revolutionary maths package, and Hyperbook software and texts, all of which are available for the Acorn Archimedes. For a brochure and full details of all Longman Logotron's educational software, write – stating whether your interest is primary or secondary education – to the address below.

Archimedes PenDown

Longman Logotron
Dales Brewery
Gwydir Street
Cambridge CB1 2LJ
Tel: 0223 323656
Fax: 0223 460208

LONGMAN LOGOTRON

```
10 REM Distance calculator
20 REM by Stephen Wade
30 REM (c) Let's Compute!
40 CLS
50 PRINT "CYCLIST'S CALCULATOR"
60 PRINT "====================="
70 PRINT:PRINT
80 INPUT "Diameter of wheel (inches) ";W
90 INPUT "Teeth on cog behind pedals ";F
100 INPUT "Teeth on back wheel cog ";B
110 INPUT "Number of pedal turns ";P
120 INPUT "How long (minutes) ";T
130 LET T=T/60
140 IF T=0 THEN LET T=0.0001
150 PRINT:PRINT
160 REM Circumference of wheel
170 LET C=W*3.14159
180 REM Gear ratio
190 LET R=F/B
200 REM Distance (inches)
210 LET Z=C*R
220 LET D=P*Z
230 REM Distance and speed
(km)
240 LET K=D/39600:LET KS=K/T
250 REM Distance and speed (miles)
260 LET M=D/63360:LET MS=M/T
270 PRINT "You travelled"
280 PRINT K;" km (";M;" miles)"
290 IF T=0.0001 THEN GOTO 330
300 PRINT
310 PRINT "Your average speed was"
320 PRINT KS;" km/h (";MS;" mph)"
330 PRINT
340 INPUT "Another? (Y/N)";K$
350 IF K$="Y" THEN RUN
360 IF K$<>"N" THEN GOTO 340
370 PRINT:PRINT
```

This program works on all home micros

IS THIS YOUR COMPUTER?

BBC/Electron/Archimedes/ PC (GW-Basic)/Amstrad CPC/ Spectrum

The listing works as shown.

Commodore 64/128

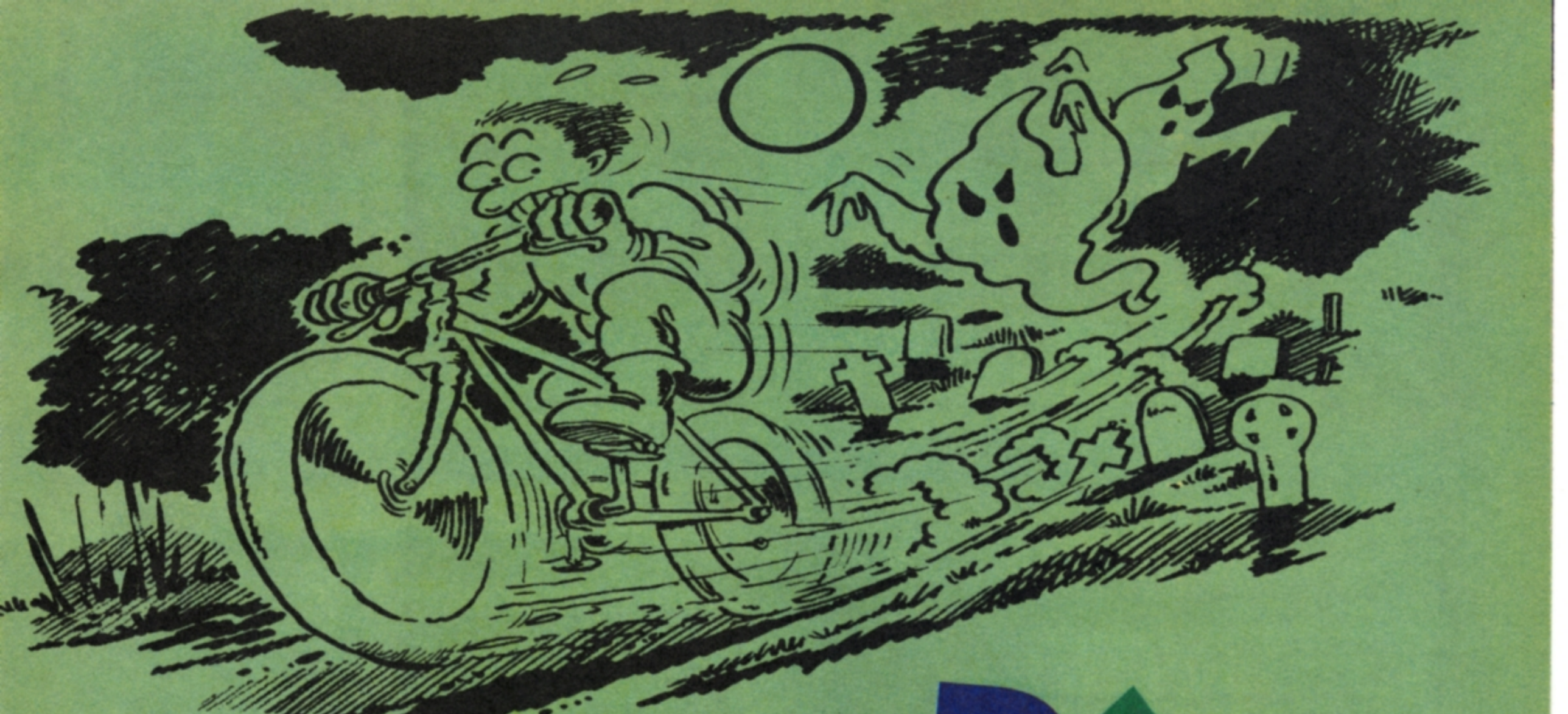
Enter the program in capitals. Change the following line:

```
40 PRINT CHR$(147);
```

ST (Stos)/Amiga (Amos)

Put a # after all the variable names except K$. For example, change Line 170 to:

```
170 LET R#=F#/B#
```



On Yer Bike!

Ever wondered how far you've travelled on a bike journey? Or how fast were you going? Stephen Wade has the answers.

Cars have speedometers and mileometers. But not many bikes do. So how do you work out how far you've travelled and at what what speed?

Use your computer! All you need is the *Let's Compute*! Cyclist's Calculator. It works for any bike that doesn't have Sturmey Archer gears.

Type in the program and SAVE it. When you RUN it you'll be asked for some numbers. Have the following answers ready and type them in when you're asked:

- *The diameter of your wheel.* This is the distance from one edge to the opposite one. Measure it in a straight line across the centre.
- *The number of teeth on the cog behind the pedals.* If you've several cogs there, note each so you can use the program for any gear. If you're lucky the numbers may be in your cycle owner's manual. It's worth checking there first.
- *The number of teeth on the back wheel cog.* Count these, like you did for the front.

You will also be asked two questions about the journey you are checking.

- How many pedal movements did you make? Once up and and down with one leg counts as one movement.
- *The time taken.* To work out your speed, your computer needs to know how many minutes you took.

Sometimes you may not be interested in the speed. You might just want to use the program to work out the distance between two places. In that case, enter zero when your computer asks for the time taken.

Once your computer knows the facts it will quickly tell you how far you travelled in both kilometres and miles. If it also knows the time taken it will also tell you your speed.

Experiment with the program. Try out different gears and see what happens to your speed.

But be careful. If you try any speed trials on your bike make sure you do it in safety.

Cat and Mouse

Sometimes the
SO WHEN ITS LIFE OR DEATH
Situation Allows
CONFLICT ON YOUR COMPUTER GAME
No Second
YOU CAN RELY ON CONTRIVER!
Chances . . .
BREEDER OF SMART MICE!

By CONTRIVER
europe ltd

FIDDLE A FLOPPY!

Find a brand new use for your damaged old discs – and try to WIN some new ones!

You should always take care of your computer discs. Especially the bendable 5.25in ones. But accidents do sometimes happen!

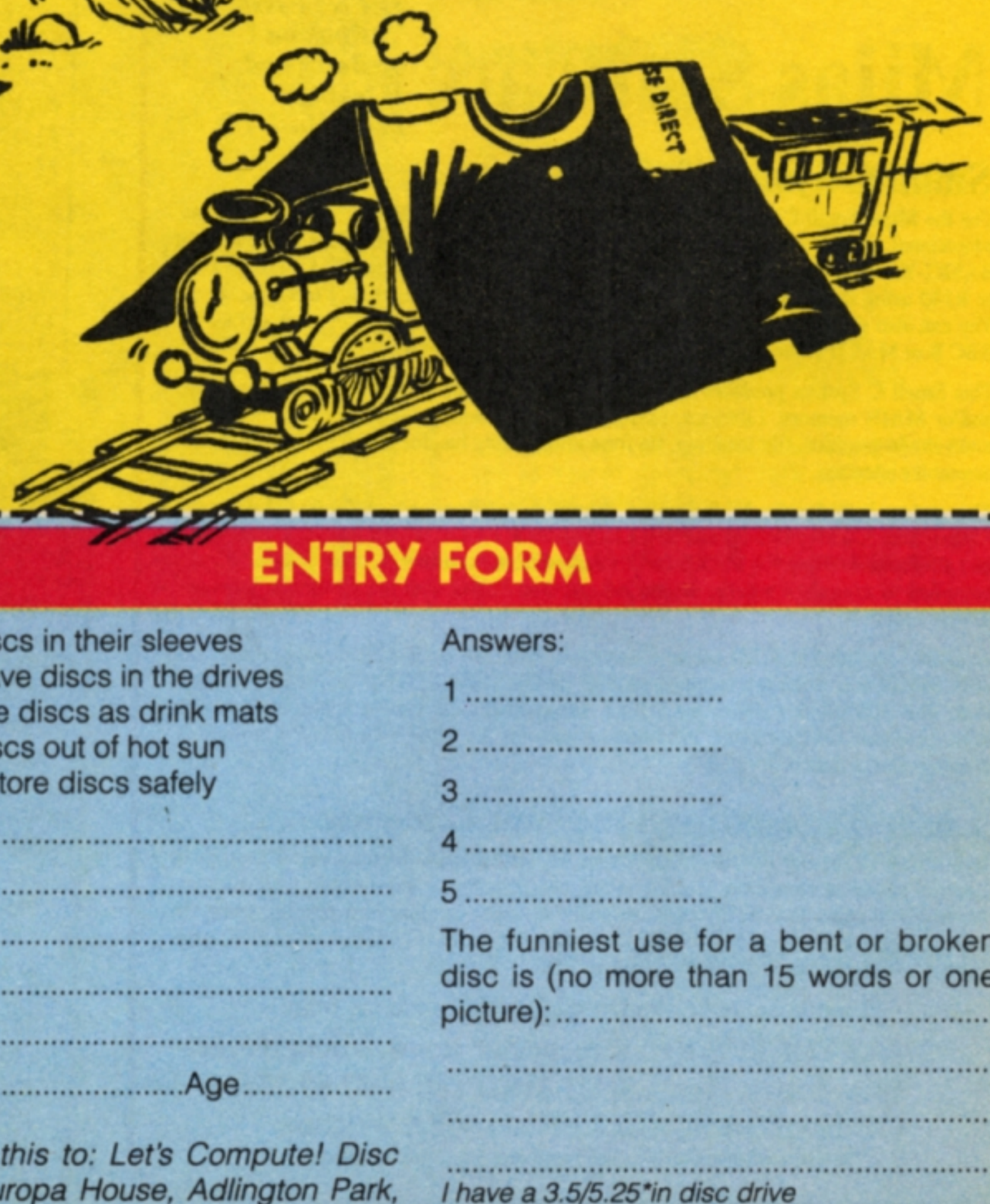
We've heard of discs that have been sat on. Some have been chewed by dogs that find they taste nicer than frisbies. There are even stories of discs being folded to fit through a letterbox.

But these damaged discs could still have their uses.

Ace cartoonist Mike Goldberg has come up with a whole host of ideas. Some are shown on this page. Can YOU think of any better ones?

You could win a prize which any disc owner shouldn't be without. Inmac are giving away 10 packs of 10 5.25in discs and 10 packs of 3.5in ones. They are also offering five red and five blue disc boxes. With your own supply of discs and a place to keep them safe you need never be a bent disc sufferer again.

So fill in the entry form now!



What you have to do

On the entry form is a list of five important things to do to keep your discs safe. Put these in the order you think is the most important from 1 to 5. Then think of one unusual, original and funny use for a bent disc.

Either draw a picture or tell us your idea. You could see YOUR picture or a Mike Goldberg cartoon of your idea in a future ***Let's Compute!***

Fill in the entry form and ensure that it reaches us before January 3 1991. The 30 correct entries with the funniest tie-breaker to be pulled from the sack will receive one of the many prizes.

ENTRY FORM

A. Keep discs in their sleeves
B. Don't leave discs in the drives
C. Don't use discs as drink mats
D. Keep discs out of hot sun
E. Always store discs safely

Name.....

Address.....

.....

.....

.....

Post Code.....Age.....

Now send this to: Let's Compute! Disc Contest, Europa House, Adlington Park, Macclesfield SK10 4NP.

Answers:

1 .....

2 .....

3 .....

4 .....

5 .....

The funniest use for a bent or broken disc is (no more than 15 words or one picture):.....

.....

.....

.....

*I have a 3.5/5.25*in disc drive*
*(*Delete the one that doesn't apply.)*

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– New Computer Express, Issue 107.

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Mijas Software

The New Issue of 'A Book on C' by Berry and Meekings £11 inclusive

Small C System £69 (inclusive of VAT p&p)

Use the Mijas Small C System on the BBC B or MASTER series computers for games, educational and industrial software. Small C programs run up to 12 times faster than in BASIC. Your code is highly portable and can be recompiled to run on the ARCHIMEDES or R140 using the Acorn ANSI C compiler (not supplied) and on many other machines. You can also use the power of the ARCHIMEDES for the rapid development and test of BBC B or MASTER programs. Manuals and post sales support included.

This Small C System produces stand-alone programs with up to 40K of code in ROM and/or MAIN memory. Libraries, extendable by the user, provide memory allocation, multi-mode graphics, file handling, i/o formatting, string handling, and system calls. Full assembler interface.

The system includes the V3.0 Small C compiler & Libraries*, Optimiser, Assembler, Linker, Source-Level Debug, and SHELL. SOURCE CODE is supplied for the compiler and all libraries. Using the MAKE facility and editable makefiles, C code is automatically compiled to assembler source, assembled and then linked with the minimum necessary library code.

Available for the MASTER series Computers, BBC B+ or B with sideways ram, and ARCHIMEDES. Software supplied on 80T double sided 5.25" or 3.5" ADFS or DFS disk. The ADFS disk contains the SHELL source code. The system is also available for other hardware configurations, including systems for the Mitsubishi MELPS processors, please write for details.

Laser Typesetting Program £23 inclusive

Low cost DTP for any BBC B, MASTER or ARCHIMEDES. Requires an HP Deskjet or Laserjet printer or emulation. Use for letters, booklets, forms and manuals with rules and shading, full multi-font justification, in single or multi-column. Fast printing using the printer's internal fonts. ADFS or DFS disk with rom image, £23 inclusive of VAT, p&p. Eprom (avoids the need for sideways ram on BBC B) £7 extra.

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*Includes original Small C code supplied at the cost of distribution

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes

The program works as shown

Amstrad CPC

Make the same changes as for the Spectrum to Lines:

```
290,320,340,420,480,500,610
```

Change the following lines:

```
  40 INK 0,0:INK 1,2:INK 2,6:
INK 3,8:INK 4,18:INK 5,20:INK
6,24:INK 7:26:MODE 0:PEN 7
  600 WHILE INKEY$="":WEND
  650 LOCATE X+1,Y+1:PRINT A$
```

Spectrum

Change the following lines:

```
  40 BORDER 0: PAPER 0: INK 7:
CLS
  50 LET W=32
  290 PAPER C3
  320 PAPER C3+C1
  340 PAPER C3+C2+1
  360 PAPER C3+C2
  420 PAPER C1
  480 PAPER C1+C2
  500 PAPER C2
  570 IF B$(S)<> " " THEN LET
S=S-1:GOTO 570
  580 LET A$=B$( TO S-1): LET
B$=B$(S+1 TO )
  600 PAUSE 0
  610 PAPER 0: CLS
  650 PRINT AT Y,X;A$
```

ATARI (Stos)/ Amiga (Amos)

Make the same changes as for the Spectrum to Lines:

```
290,320,340,420,480,500,610
```

Change the following lines:

```
  40 MODE 0:CURS OFF:KEY OFF:
HIDE
  45 COLOUR1,$700:COLOUR2,$7:
COLOUR4,$70:COLOUR3,$707:COLOU
R5,$770:COLOUR6,$77:COLOUR7,$7
77
  600 WHILE INKEY$="":WEND
  650 LOCATE X,Y:PRINT A$
```

Amos: Leave out `KEY OFF` in Line 40

PC (GW Basic)

Change the following lines:

```
  40 SCREEN 0:CLS
  50 LET W=40
  60 LET S$=STRING$(4,219)
 160 LET C1=4:GOSUB 410
 170 LET C2=2:GOSUB 470
 190 LET C1=4:GOSUB 410
 200 LET C2=1:GOSUB 470
 220 LET C1=2:GOSUB 410
 230 LET C2=1:GOSUB 470
 260 LET X1=4:LET Y1=4:LET C1
=4:GOSUB 420
 270 LET X1=8:LET Y1=8:LET C2
=2:GOSUB 480
 280 LET X1=0:LET Y1=8:LET C3
=1
 290 COLOR C3+8
 320 COLOR C3+C1+8
 340 COLOR C3+C2+C1+8
 360 COLOR C3+C2+8
 400 STOP
 420 COLOR C1+8
 480 COLOR C1+C2+8
 500 COLOR C2+8
 600 LET G$=INKEY$:WHILE G$="
":LET G$=INKEY$:WEND
 610 COLOR ,0:CLS
 650 LOCATE Y+1,X+1:PRINT A$
```

Commodore 64/128

Change the following lines:

```
  40 POKE 53280,0:POKE 53281,
0:PRINT CHR$(147);
  45 FOR N=1 TO 7:READ A:C$(N
)=CHR$(A):NEXT N
  50 LET W=38
  60 LET S$=CHR$(18)+"    "+C
HR$(146)
  290 PRINT C$(C3);
  320 PRINT C$(C3+C1);
  340 PRINT C$(C3+C2+C1);
  360 PRINT C$(C3+C2);
  420 PRINT C$(C1);
  480 PRINT C$(C1+C2);
  500 PRINT C$(C2);
  600 GET A$:IF A$="" THEN 600
  610 PRINT CHR$(147);
  650 POKE 211,X:POKE214,Y:SYS
58732:PRINT A$;
 1000 DATA 28,30,158,31,156,15
9,5
```

The Safe Scientist looks at what happens when you...

PAINT WITH LIGHT

Hi there again. This month we're looking at how coloured lights behave.

Imagine some projectors shining coloured squares on to the back of your computer screen. Where the colours mix you get different colours.

Our program shows what happens. The colours from our imaginary projectors are called primary colours.

Where two or more mix they create what are called secondary colours.

It's like mixing paints to make new shades. But note something strange.

The colours you get when you mix lights are different to what you get when you mix paints.

Type the program in, SAVE it and RUN it. After the intro screen you'll see two overlapping areas of primary lights.

Where these cross you'll see the secondary colour. Press the spacebar to see other pairs of colours and their mixes. When the three possible combinations of two primary lights have been tried all three primary colours are shown at once. Now you can see what happens when all three overlap.

Why should we want to mix coloured lights? Well it's happening all the time inside your TV set. Millions of different colours are being created all the time.

Without colour mixing your favourite TV show would look very dull indeed.

As our program shows, red, green and blue can be mixed by your computer to give other colours. But this is only the start. It's well worth you investigating more about colours yourself.

If you add secondary colours together you get even more. You can also subtract colours.

● *Next month get your seat belts ready. We're off to study gravity! And you'll have the chance to touch down on any planet in the solar system!*

WHAT GOES ON IN A TV TUBE?

This program gives you an idea how your TV set works. At the back of the tube there are red, green and blue "projectors" – called electron guns.

When these fire at the screen coloured dots light up. The dots are so close that if, say, a red and blue one light up next to each other you see purple.

Every picture you see on your screen is made up from these primary colours. But your TV set can do more with them than our simple program can. It can give the three colours different degrees of brightness.

This means that, for example, they can mix bright green with dull red.

Now that's a really unusual colour!

```
  10 REM COLOURS
  20 REM BY THE SAFE SCIENTIST
  30 REM (c) LET'S COMPUTE!
  40 MODE 2
  50 LET W=20
  60 LET S$="    ":REM 4 spaces
  70 LET A$="Primary Colours":LET Y=1:G
OSUB 640
  80 LET B$="Some projector beams shine
 onto a screen and overlap.":GOSUB 540
  90 LET B$="When colours merge they gi
ve a new colour.":GOSUB 540
 100 LET B$="The projectors shine out i
n red, blue or green.":GOSUB 540
 110 LET B$="These are called the PRIMA
RY colours.":GOSUB 540
 120 LET B$="The new colours are called
SECONDARY colours.": GOSUB 540
 130 LET B$="Let's look at the secondar
y colours.":GOSUB 540
 140 LET B$="Mixing Two Colours"
 150 GOSUB 600
 160 LET C1=1:GOSUB 410
 170 LET C2=2:GOSUB 470
 180 GOSUB 600
 190 LET C1=1:GOSUB 410
 200 LET C2=4:GOSUB 470
 210 GOSUB 600
 220 LET C1=2:GOSUB 410
 230 LET C2=4:GOSUB 470
 240 LET B$="All three colours."
 250 GOSUB 600
 260 LET X1=4:LET Y1=4:LET C1=1:GOSUB 4
20
 270 LET X1=8:LET Y1=8:LET C2=2:GOSUB 4
80
 280 LET X1=0:LET Y1=8:LET C3=4
 290 COLOUR 128+C3
 300 LET A$=S$+S$:LET IS=8:LET IE=11:LE
T XS=0:GOSUB 440
 310 LET A$=S$:LET IS=0:LET IE=7:LET XS
=0:GOSUB 440
 320 COLOUR 128+C3+C1
 330 LET XS=4:GOSUB 440
 340 COLOUR 128+C3+C2+C1
 350 LET XS=8:GOSUB 440
 360 COLOUR 128+C3+C2
 370 LET IS=8:LET IE=11:LET XS=8:GOSUB
440
 380 LET B$="That's all folks."
 390 GOSUB 600
 400 LET B$="":GOSUB 600:RUN
 410 LET X1=2:LET Y1=4
 420 COLOUR 128+C1
 430 LET A$=S$+S$+S$: LET IS=0:LET IE=1
1:LET XS=0
 440 LET XS=XS+W/2-10
 450 FOR I=IS TO IE:LET X=X1+XS:LET Y=Y
1+I:GOSUB 650:NEXT I
 460 RETURN
 470 LET X1=6:LET Y1=8
 480 COLOUR 128+C1+C2
 490 LET A$=S$+S$:LET IS=0:LET IE=7:LET
 XS=0:GOSUB 440
 500 COLOUR 128+C2
 510 LET A$=S$:LET IS=0:LET IE=7:LET XS
=8:GOSUB 440
 520 LET A$=S$+S$+S$:LET IS=8:LET IE=11
:LET XS=0:GOSUB 440
 530 RETURN
 540 PRINT
 550 IF LEN (B$)<=W THEN PRINT B$:RETUR
N
 560 LET S=W
 570 IF MID$(B$,S,1)<> " " THEN LET S=S
-1:GOTO 570
 580 LET A$=LEFT$(B$,S-1):LET B$=MID$(B
$,S+1)
 590 PRINT A$:GOTO 550
 600 PRINT:PRINT"PRESS SPACE":AA=GET
 610 COLOUR 128:CLS
 620 LET Y=0
 630 LET A$=B$
 640 LET X=INT ((W-LEN (A$))/2)
 650 PRINT TAB(X,Y);A$
 660 RETURN
```

TURBOSOFT

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Let's Compute! Jan 91

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There is more than one way to skin a cat. Our resident micro medic tells of three ways to save you jumping out of loops.

THE PROGRAM DOCTOR

Last month Doc operated on the program shown top right. It tests whether you know the alphabet. If you didn't try it last month, type it in and RUN it now.

It will seem to work as it is. But if you type the alphabet in the wrong order a few times you are likely to get an error message.

That's because each time you press a wrong letter the program jumps out of a loop.

Last month the Doc prescribed a cure to remove this problem. Now he looks at even better methods of doing the same job.

The one you should use depends on the Basic language fitted in your computer. At least one of the ways will work on YOUR machine. *The panel on the right tells you which you can use.*

First, let's describe the simple game in words. You have to REPEAT typing a key UNTIL you've gone through the whole alphabet OR have made a mistake.

If your Basic understands the commands REPEAT ... UNTIL and OR those words can be put into the program almost exactly as they are spoken.

The *You've made a mistake* part comes when a flag is set to 1. Remember, we used flags last month. So you can REPEAT the loop UNTIL I>26 OR F=1.

Note that REPEAT ... UNTIL loops don't automatically add one to *I* so Doc put I=1 near the start of the program and I=I+1 in the loop. All doc's changes are shown on the right.

Some versions of Basic don't understand REPEAT ... UNTIL but have another type of loop. It's called WHILE ... WEND.

Like the repeat type of loop it works as you would say it: *"While the 26th letter hasn't been reached and a mistake hasn't been made keep looping"*. WEND is used to show the end of the loop.

Doc's second set of changes show what you have to do if you want to use this sort of loop.

But some Basics have neither WHILE ... WEND nor REPEAT ... UNTIL – see the panel to check which YOUR machine uses. So Doc's final changes show how you can do REPEAT ... UNTIL without actually having the instructions in your version of Basic.

In place of REPEAT put a REM to show it's the start of the loop. In place of *UNTIL something happens* you have to go back to the start of the loop if it hasn't happened.

So Doc has now shown four cures for the same problem. And there are plenty of others.

The main point to remember is that you should NEVER jump out of a loop.

This program works on all home micros

This is the original program:

```
  10 CLS: REM C64 PRINT CHR$(147);
  20 PRINT "TYPE THE ALPHABET NOW!"
  30 FOR I = 1 TO 26
  40 GOSUB 160
  50 PRINT K$;
  60 IF K$<>CHR$(I+64) THEN GOTO 100
  70 NEXT I
  80 PRINT:PRINT:PRINT "WELL DONE"
  90 GOTO 110
 100 PRINT:PRINT:PRINT "YOU GOT IT
WRONG"
 110 PRINT:PRINT "DO YOU WANT ANOTHE
R GO?"
 120 GOSUB 160
 130 IF K$="Y" THEN GOTO 10
 140 PRINT:PRINT "BYE"
 150 END: REM ON SPECTRUM USE STOP
 160 INPUT K$
 170 RETURN
```

Here are the changes Doc made to the original program using REPEAT ... UNTIL:

```
  25 LET F=0:LET I=1
  30 REPEAT
  60 IF K$<>CHR$(I+64) THEN LET F
=1
  65 LET I=I+1
  70 UNTIL I>26 OR F=1
  75 IF F=1 THEN GOTO 100
```

Here are the changes Doc made to the original program using WHILE ... WEND:

```
  25 LET F=0:LET I=1
  30 WHILE I<=26 AND F=0
  60 IF K$<>CHR$(I+64) THEN LET F
=1
  65 LET I=I+1
  70 WEND
  75 IF F=1 THEN GOTO 100
```

Here are the changes Doc made to the original program to make his own REPEAT ... UNTIL:

```
  25 LET F=0:LET I=1
  30 REM REPEAT
  60 IF K$<>CHR$(I+64) THEN L
ET F=1
  65 LET I=I+1
  70 IF I<=26 AND F<>1 THEN GOTO
30
  75 IF F=1 THEN GOTO 100
```

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes
The Basic in these computers understands REPEAT ... UNTIL but not WHILE ... WEND.

CPC/PC(GW-Basic)
The Basic in these computers understands WHILE ... WEND but not REPEAT ... UNTIL.

Amiga and Atari ST
Stos and Amos understand both WHILE ... WEND and REPEAT ... UNTIL.

Spectrum/ Commodore 64/128
The Basic in these computers doesn't understand either REPEAT ... UNTIL or WHILE ... WEND.

Do you think YOU have written a program that can't be improved? Then send it along to the Program Doctor. He loves a challenge!

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You can find out how to join the Club on Page 32 – and about all the other goodies sent out to members.

However, if you only want Turtle Logo we'll send it to you for just £1 if you complete and return the coupon below

NOW IT'S THE IMPOSSIBLE TRIANGLE...

Tech Turtle is good at making things. But Tricky Turtle has got him beat this time!

Tricky used his computer to draw a triangle for Tech to make. The program he used is shown here.

Our picture shows Tech trying to make his model. Maths experts call it the impossible triangle.

And you can easily see why!

You can draw one yourself using Tricky's program. First you need to run the Logo Language. This is available for most computers.

(If you haven't got Logo and you're using an Acorn computer the Let's Compute! Turtle Logo is an ideal starting point: See the offer on the left.)

Once your Logo language is running type in Tricky's program. Then SAVE it by entering:

```
SAVE "NOTEPOSS
```

Now the program is in your computer. You can see Tricky's triangle. Then see by entering:

```
IMPOSS 60
```

To draw triangles of different sizes just change the 60 to another number.

Can you draw any interesting, interweaving patterns in Logo? If you can we'd love to see them.

The address: *Let's Compute!* Adlington Park, Macclesfield SK10 4NP. There's a super Let's Compute! baseball cap for the writer of every one we print.

```
TO IMPOSS :SIZE
HT
RT 30
REPEAT 3 [SHAPE :SIZE
JUMP :SIZE]
END

TO JUMP :SIZE
PU
FD :SIZE * 2
LT 120
FD :SIZE * 6
LT 60
PD
END

TO SHAPE :SIZE
FD :SIZE
LT 60
FD :SIZE * 7
LT 120
FD :SIZE * 6
LT 120
FD :SIZE * 4
END
```

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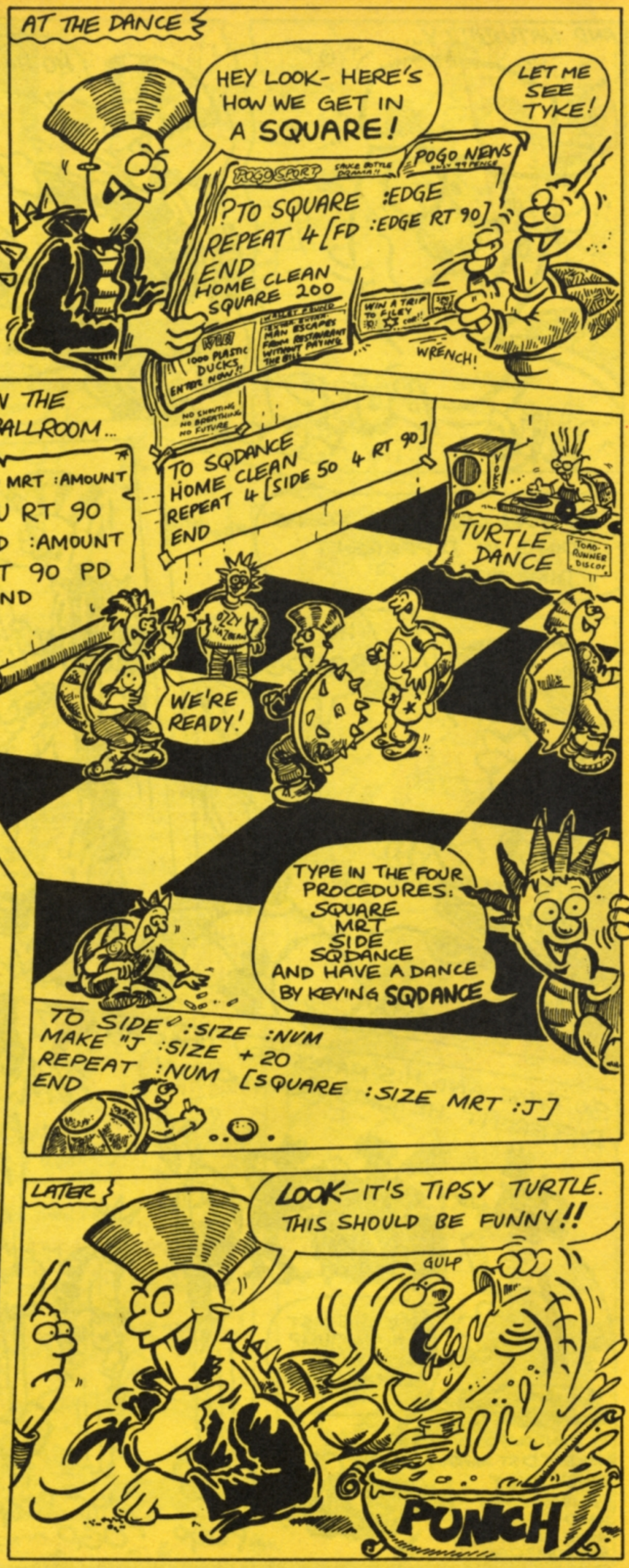


BUT TYKE SOON GOT TIRED OF **SQUARE**ING - AND GOT **POGO**-ING !!

AND NATURALLY...

HIC BURP

HO HO!

STAGGER

WOOOOOH!

HIC HIC

WOBBLE

```
TO TIPSY
FD RANDOM 100
RT RANDOM 360
TIPSY
END
TIPSY
```

SO HOW COME HE KEEPS GOING IN DIFFERENT DIRECTIONS?

HE USES **RANDOM**

SO IF I USE **RANDOM** I COULD JUMP TO DIFFERENT HEIGHTS?

HOW TO DO IT

YES! IF YOU USE RANDOM FOLLOWED BY A NUMBER, THAT WILL BE THE HIGHEST YOU'LL JUMP.

POGO

SO TYKE AND HIS MATES TRY POGO-ING DIFFERENT HEIGHTS (RANDOMLY)

USE THIS LIST WITH THE JUMP PROC. YOU'VE ALREADY TYPED IN.

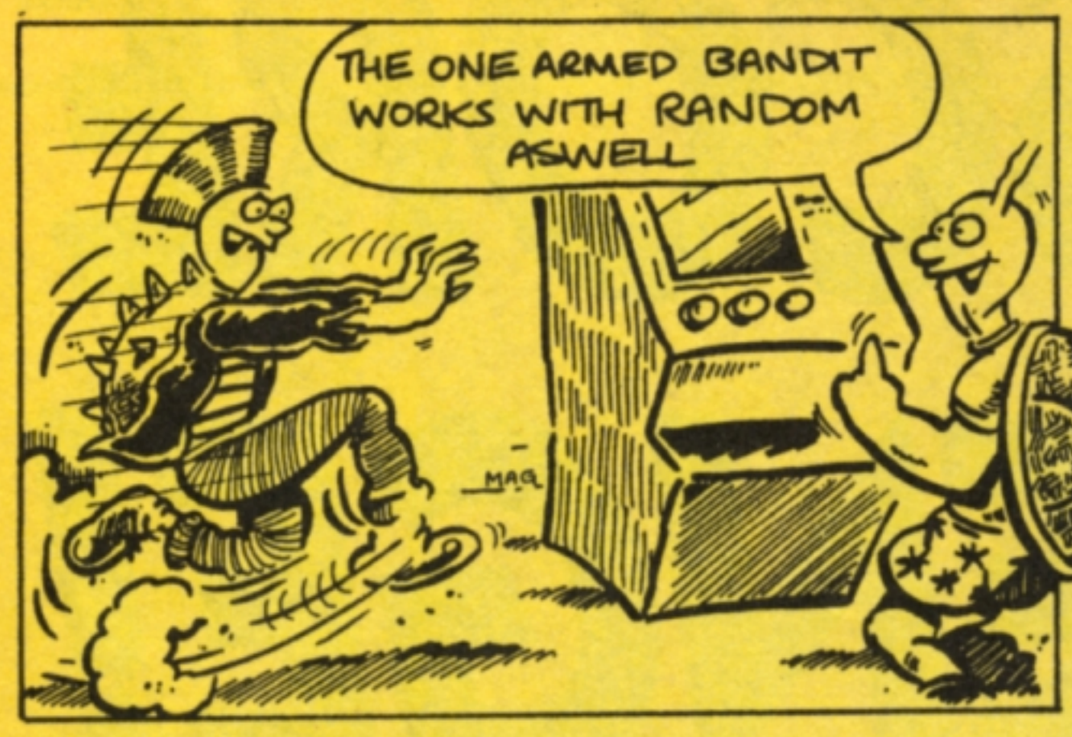
```
TO RANDOMPOGO
MAKE "DIST RANDOM 300
JUMP :DIST
RANDOMPOGO
END
HOME CLEAN PU
RANDOMPOGO
```

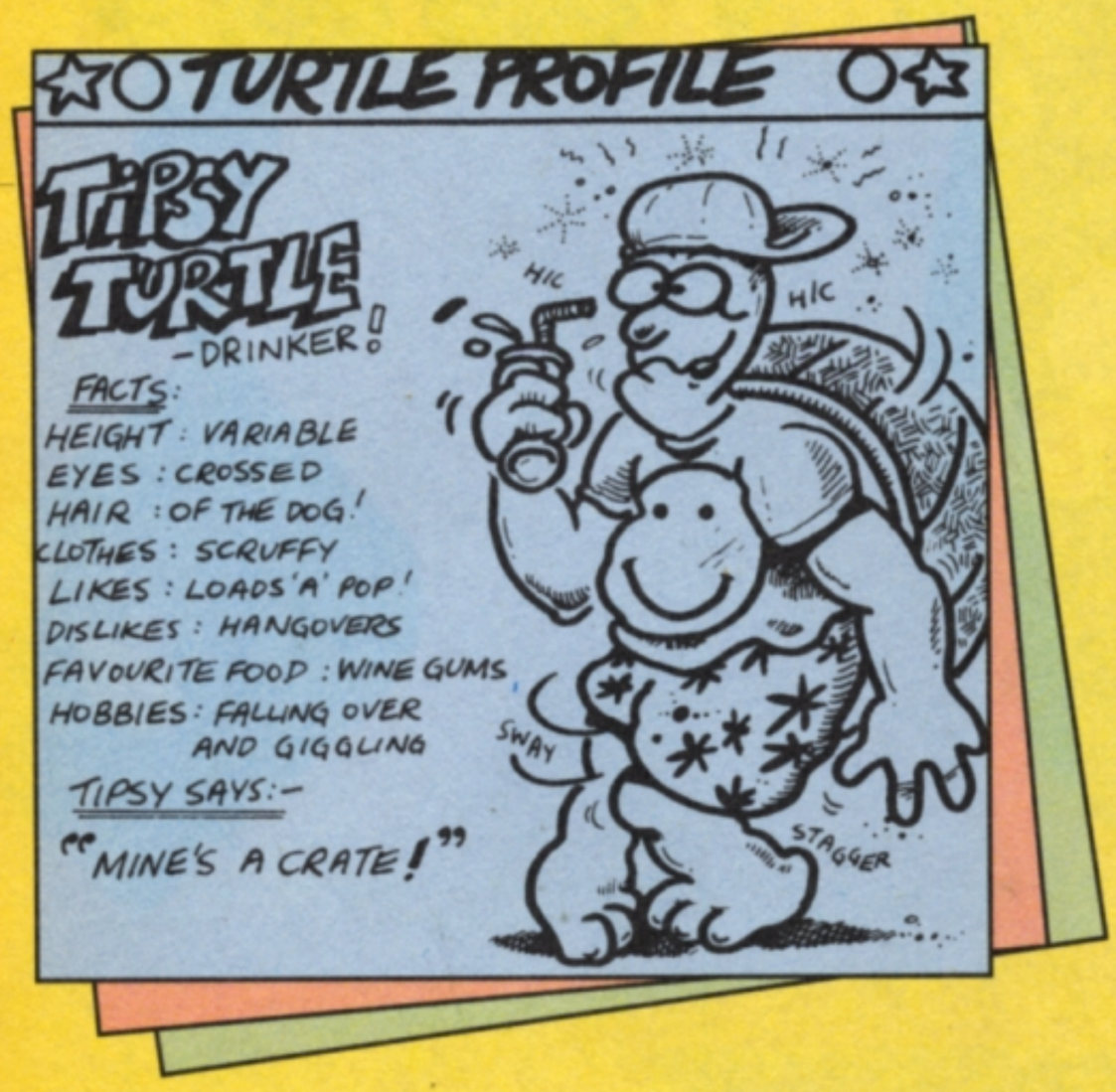
AAAA

POGO POGO POGO

WOH! I'M LOSING MY MONEY!

MONEY!! LET'S TRY THE BANDIT!






```
TO START
PU LT 90
FD 500
RT 90 PD
END
TO NEXT
PU RT 90 FD 350
LT 90 PD
END
TO VIEW
START
REPEAT 3 [SHAPE NEXT]
END
TO BANDIT
PU HOME CLEAN PD
VIEW
REPEAT 200 [PU PD]
BANDIT
END
TO SHAPE
MAKE "SIDE 3 + RANDOM 4
MAKE "LEN ( 300 - 25 * :SIDE )
MAKE "TURN ( 360 / :SIDE )
REPEAT :SIDE [FD :LEN RT :TURN]
END
BANDIT
```

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LET'S COMPUTE!

Game	Computer	Score	Name	Age
Afterburner	Amiga	20,127,290	Richard Irons	13
Arcade Soccer	BBC	22-0	Sattar Shakoor	12
Arcardians	Electron	63,120	James Jagger	12
Arkanoid	BBC	230,420	David John Mound	11
Batman	C64	337,250	Nathan Philips	-
Canyon	BBC	2,429	Heetan Patel	11
Chuckie Egg	BBC	689,724	Winston Chambers	12
Commando	Electron	105,900	Alan Tucker	13
Creepy Cave	Electron	504,030	James Lawford	10
Danger UXB	Electron	1,010,570	Royston Palin	10
Deathstar	Electron	118,800	James Brand	15
Double Dragon	Spectrum	86,300	Paul Maggs	13
Drop Ship	Archimedes	198,830	Michael Murphy	13
Fruit Machine	CPC	930	Samatha Methuen	12
Galaforce 2	BBC	111,970	Hiten Mistry	14
Guardian Angel	ST	251,210	James Laidlow	13
Joust	BBC	153,000	Chris Irwin	13
Keyman	BBC	98,100	Simon Marwood	12
Lander	Archimedes	1,020	David Greere	12
MagMax	CPC	91,194	James Norton	10
Matchday 2	CPC	9-0	Stephen Esdale	12
Missile Control	BBC	2,045	Paul Tarling	8
Mr EE	BBC	70,600	James Greenstreet	12
Op. Thunderbold	Amiga	333,600	James Butler	13

Game	Computer	Score	Name	Age
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Pipemania	BBC	56,400	Matthew Thompson	16
Planatoid	Electron	47,875	Neil Giggins	13
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Rainbow Islands	Spectrum	2,320,150	Alan Whysall	14
Return of the Jedi	BBC	43,213	Ryan Simpson	10
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Soloman's Key	ST	100,000	James Hayward	7
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Superior Soccer	Electron	12-0	Ricard Ash	15
Swoop	BBC	950	Matthew Chatterley	11
Swoop	Electron	3,120	James Hollis	14
Thundermonk	Archimedes	42,134	J ohn Edwards	13
Zalaga	BBC	24,0000	Lawrence Hene	12
Ziggy	BBC	96%	A Jenkins	12

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..... Game ..... Score .....

.....Age ..... Game ..... Score .....

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LETSC01

SWEAT

What we call a program is nothing more than a list of instructions to your computer.

These instructions must be in a language that your computer can understand. Nearly all the listings in *Let's Compute!* are in the computer language Basic. This is understood by most home computers.

As a rule, if each line of a program starts with a number it's in Basic. And you must have Basic running in your computer before you start typing in a Basic program.

The BBC Micro, Electron, Spectrum, Amstrad CPC and Commodore 64/128 have Basic running from the moment they're switched on.

If you don't get the message BASIC when you switch on a BBC or Electron, type:

```
* BASIC
```

Then press the Return key and you should be in Basic. On the Archimedes and BBC A3000 you usually see the *Desktop* when you switch on. If you press the F12 key a new line starting with a star will appear at the bottom.

Like on the BBC and Electron, type *BASIC and you're ready to go.

WARNING: The Amiga, Atari ST and PC do not have Basic built in. You have to load it from disc.

You can get several different types of Basic for these computers. The programs in *Let's Compute!*

Keying in a program listing is easy. Or is it? Be warned! There are lots of pitfalls. One simple mistake could stop the whole program from working. But you can make sure YOUR typing is error free by following this simple advice.

are designed to run if you use Stos on the Atari ST or Amos on the Amiga.

Many people already have Stos and Amos. They come from Database Software (0625 859333). If you've got an Amiga, you'll also find that the BBC versions of the programs will work if you use Commodore's BBC emulator.

If you use a PC you will also have to load Basic from disc. Again there are several choices. The PC listings we give are for GW-Basic.

Most of the programs will also run on one of the versions of BBC Basic that you can get for the PC. If you use BBC Basic, choose the BBC listings, not the PC ones.

SIMPLE STEPS TO SUCCESS

- Before you start entering a new program type NEW to empty the computer's memory
- A Basic *program line* begins with a line number. Don't press Return until you've typed the whole line. *(That doesn't mean the line as you see it in print.)* Pressing Return is the LAST thing you do before you get to the next line number.
- When you press Return after typing in a line nothing appears to happen. What you've done is store the line in the micro's memory. It will not be activated until you are ready to tell the program to RUN.
- Use the exact figures and letters that you see in the listing. Don't change ANYTHING.
- Capital letters MEAN capital letters (and lower case letters mean lower case letters).
- Take care with keys that can be mistaken for others. Examples are Ø (zero) instead of 0 or 1 instead of I.
- If you make a mistake while you're typing a line you can correct it so long as you haven't pressed Return. Use Delete to move back down the line and rub out the error. Then re-type the part you erased.
- If you notice a mistake AFTER you've pressed Return just retype the whole line – including the line number. It will replace the one you got wrong.
- If you want to clear the screen type CLS and press return. This only wipes the display. Your program remains in the micro's memory. On the C64 use the CLR key instead.
- SAVE your program at frequent intervals while you type it in – don't wait until you've finished.
- To see the program stored in memory, type LIST.
- To make the program in memory work type RUN.

Take care typing!

If you type in a program from *Let's Compute!* just as it is printed it will always work. But if you don't copy it exactly one of two things will happen:

- You may get an error message because your computer doesn't understand something you typed in.
- Something unusual may happen, but not what you expect.

In the case of the first of these you'll get an error message. It usually gives a line number as well.

Check that line first. But your computer isn't always right! Some errors will report the wrong line number. So check other lines too.

An example of the second type of mistake would be if you type 3+1 instead of 3-1. Your program would work but give you the wrong answers.

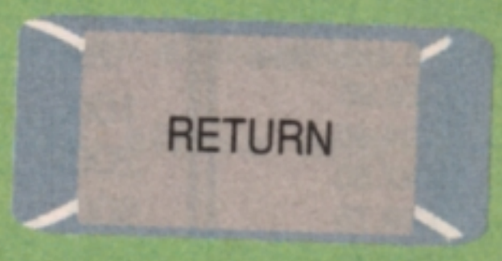
The motto is simple. If your program doesn't do what you expect – CHECK EVERY LINE!

NOT!

A key difference

Some computers have a key marked RETURN. Others have one labelled ENTER. Some have both.

In *Let's Compute!* when we say Return, you can use either Return or Enter.



SAVING AND LOADING

Make sure you SAVE your program at frequent intervals. Then if you have a power cut or the cat pulls out the plug you won't lose all your work.

First, decide on a short name for your program – say GAME – and then enter:

```
SAVE "GAME"
```

Notice that the program's name has quotes before and after it.

What happens next depends on whether you're using tape or disc. But the messages that appear on your screen are clear and you should have no problems if you follow them.

To put the program back into your micro's memory at the start of a new session, all you have to do is make sure the tape or disc is ready and then enter:

```
LOAD "GAME"
```

When it's loaded you can LIST it, RUN it or, if you haven't completed typing it all in, continue adding more lines.

POINTS TO WATCH

The points listed in the main part of this article apply to ALL computers. Here are some more to watch out for on different machines:

Spectrum

On 48k Spectrums you give instructions like PRINT and FOR by pressing one key. If you type all the letters of the word, instead of the single key that's on your keyboard, it will not work even if it looks right.

Amstrad CPC

Spaces are very important on the CPC. Make sure you leave one between the Basic word and the rest of the line.

Joysticks – especially auto-fire ones – can upset how your keyboard works. If the wrong characters appear, unplug your joystick.

PC (GW-Basic), Atari ST (Stos) and Amiga (Amos)

Take care that the line on the screen where you're typing is blank when you start. If there are any characters on it you could be in trouble. When you press Return after typing your new line you might see the message *syntax error* on your screen.

Commodore 64/128

As with the PC, don't type on a line that already has something on it.

After typing a quote mark (") you may get strange characters. If you do, press Return and start again.

Take care when you type + or -. Remember you don't have to press Shift to get these.

If you do use Shift to get + you get something that looks right. But you'll get an error message when you run the program.

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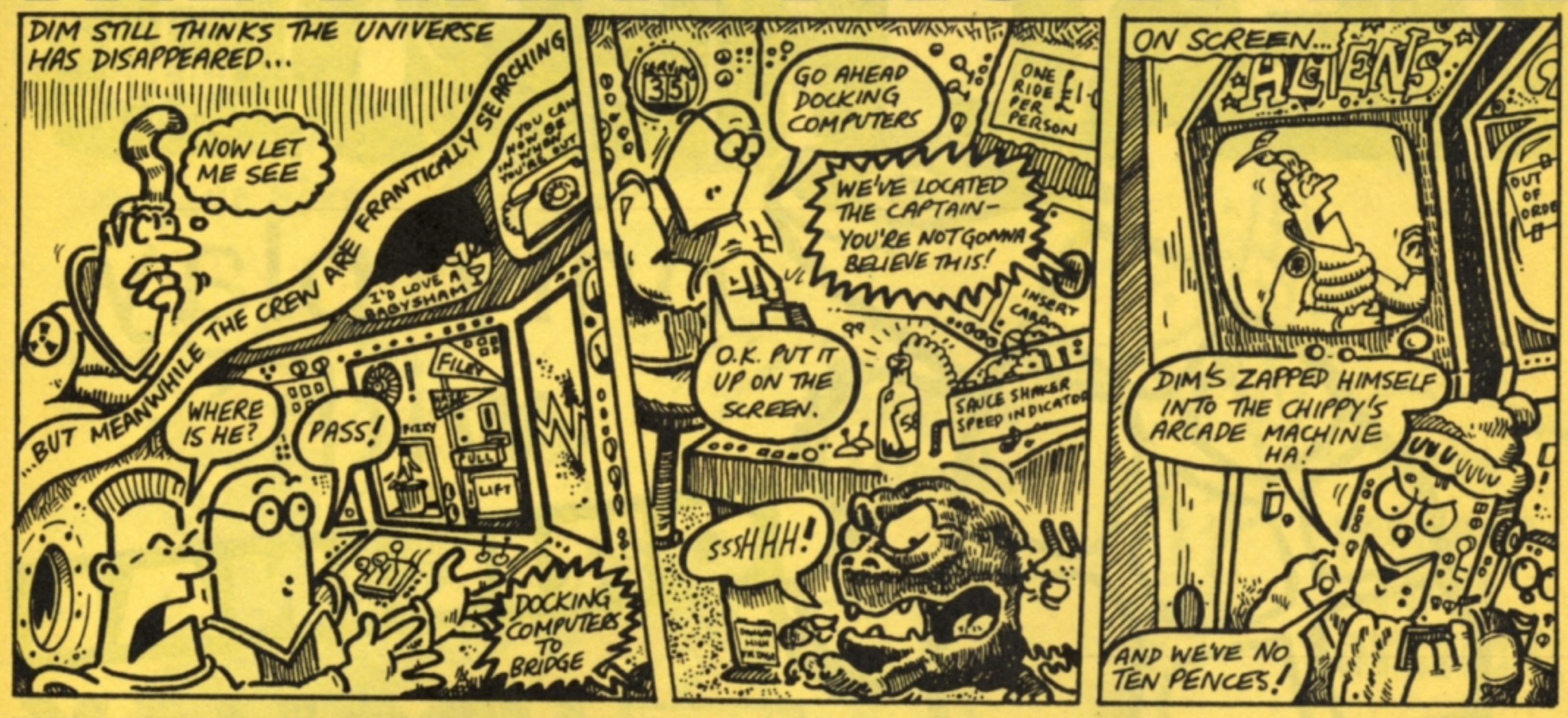

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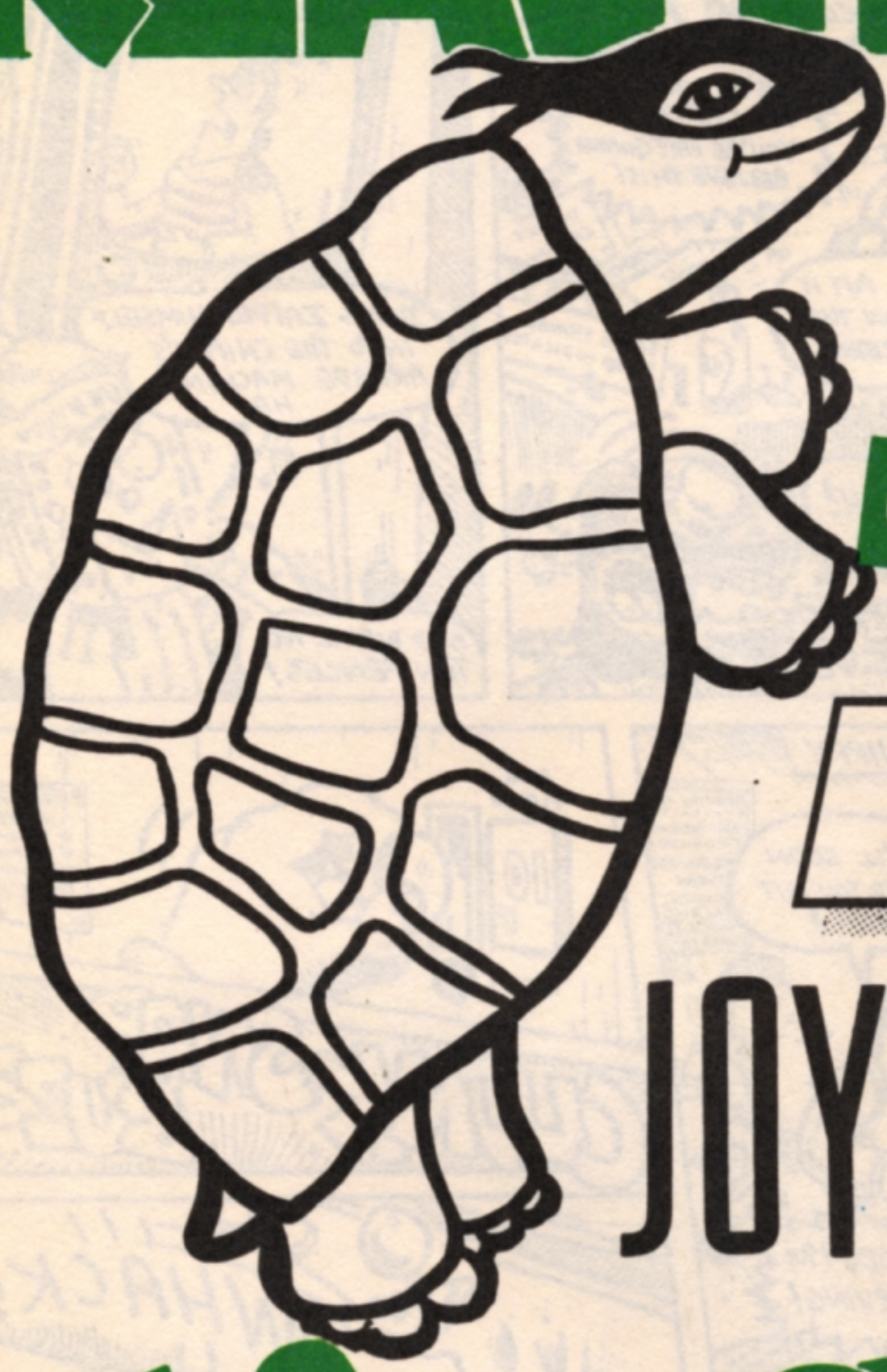

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