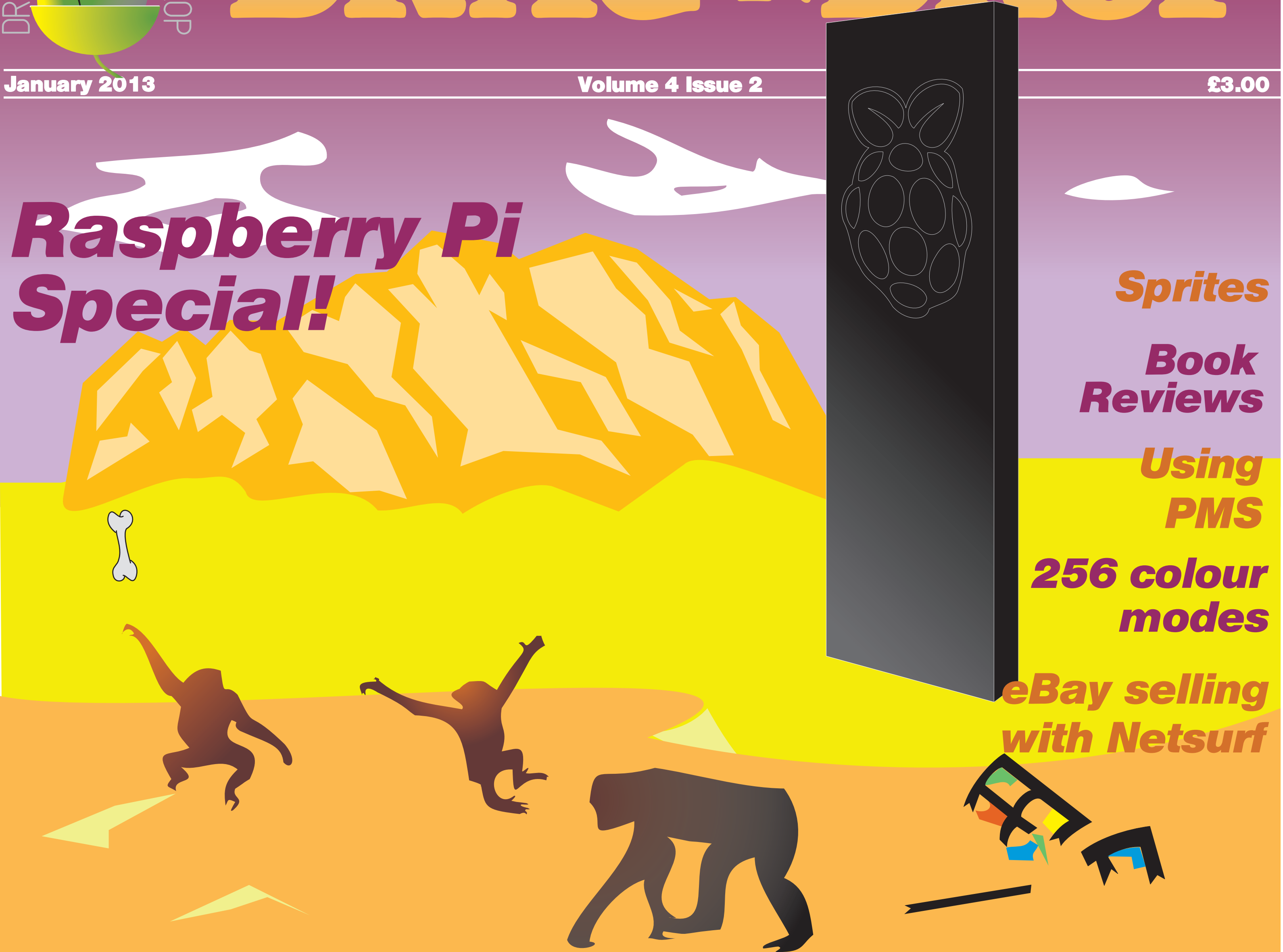
DRAG'NDROP

January 2013 Volume 4 Issue 2 £3.00



Raspberry Pi Special!

Sprites

Book Reviews

Using PMS

256 colour modes

eBay selling with Netsurf

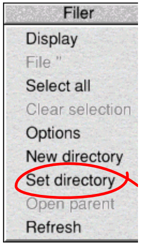
At a Glance...

Beginner’s Programming Tips

Programs listed in *Drag 'N Drop* are assumed to work on all machines with RISC OS 5 (Raspberry Pi, Beagleboard, Armini) unless otherwise stated.

To get the BBC Basic > prompt press F12 and type***BASIC** and press Return. To return to the desktop type ***QUIT** and press Return. You can also program in a task window by pressing Ctrl+ F12 but you can't use the cursor editing facility or change MODE.

You can also program and run Basic programs from the desktop. Double-clicking on the filer icon runs it, holding down Shift and double clicking loads it into your text editor (click "OK" if you get the message "This program contains a line reference...").



To set the current directory, click the filer menu and select "Set directory". Anything you save from the BBC Basic goes into this directory so you know where to find it later on. This is useful if you are going to press F12 and program outside the desktop.

Do you have a question? Don't be afraid to ask! Write to editor@dragdrop.co.uk

NEWS

ROOL price increases

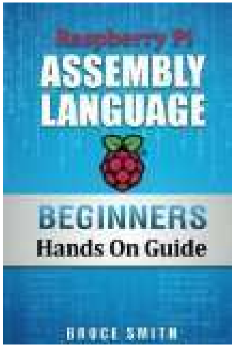
RISC OS Open Ltd (ROOL) have increased the price of the RISC OS Pi from £10 to £12. The cost of the NutPi add-on software pack has also increased, from £35 to £42. Both inclusive of postage and packing.

The twenty applications in NutPi retailed at over £600 previously so it still represents outstanding value. We suggest that £12 for the OS card is also still good value for money if you are not confident at "blowing" your own or don't have access to a non-RISC OS computer to partition the card.

New CDVDBurn

A new version of !CDVDBurn by Hubersn Software is expected to be officially released soon. Steffen has given test copies to existing owners of CDVDBurn (who ask nicely—Ed) and we found it work perfectly on the Pi with Samsung DVD writer.

Machine Coder's HOG



Bruce Smith (he of Acorn User and A&B Computing fame) has made a welcome re-entry into the RISC OS world with his new book, *Raspberry Pi Assembly Language.* Available from Amazon priced £12.99 this provides up-to-date information for budding machine coders. See our book reviews section for an in-depth look.

Drag'nDrop CD-Roms

Two CD-Roms are to be released at the RISC OS South West Show. 'Drag'nDrop Back Issues' contains all the magazines in PDF as well as Ovation/Easiwriter format. You can build up a valuable reference library of computng knowledge, as well as having access to all the specially designed RISC OS clip-art used in the magazine.

'55 BBC Micro Books' is a very unique, high-quality digitally remastered archive of over 50 BBC Micro books in PDF, HTML and Easiwriter/Impression format.

Much of the material, particularly on BBC Basic, is still relevant and many programs will run on your Raspberry Pi!

Price of the CD-Roms is £12 each, including postage anywhere in the world. But if you come to the South West show you can get them for the special price of just £10 each!

Wakefield 2013 Show Announced

The Wakefield RISC OS Computer Club are pleased to announce that the Wakefield Acorn & RISC OS Computer Show will be returning once again in 2013.

As provisionally revealed at the London Show in October, the north's premier RISC OS event will be taking place at its familiar home of the Cedar Court Hotel near Wakefield on 20th April.

Details of the show are still being finalised, but we can confirm that the format will be similar to that of previous years and will once again include the popular Show Theatre with a range of talks covering the RISC OS market.

We also expect the Raspberry Pi to feature heavily on the day.

21st CENTURY COMPUTING

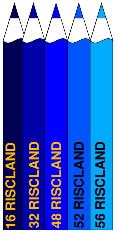
What computer system can be had for under £70 and is the best computer since the Archimedes? It's the Raspberry Pi, that's what. Here we take a look at the little machine that is taking the RISC OS world by storm.

The computer comes in the form of a bare circuit board but complete with essential components like USB sockets and a network port.

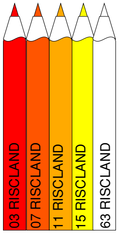
Stockists of the £35 board include RS Components, Farnell and Amazon. We recommend Amazon as their website is accessible with Netsurf. There was an early version of the Pi (the Model A) but the standard version of the Raspberry Pi is now the Model B with 512 megabytes of RAM.

Cases for the Pi are plentifully available - from cheap and cheerful acrylic cases on eBay for £3 or a robust £18 job from CJE Micros which lets you bolt your Pi to an old ATX case. ATX and ITX refer to the metal cases your old desktop machine sits in.

At the heart of the Pi is the ARM11 chip. Ever since the first Archimedes machine in 1987 (which cost over £1000) ARM chips have powered just about every RISC OS machine ever made. Such was the demand for the Pi that the first few



256 COLOUR MODE THEORY



In this article and the next one we'll be examining the 256 colour screen modes - demystifying COLOUR, TINT, palette registers, and why we can (and can't) redefine the colours in Modes like Mode 13.

Since the first Archimedes machine, we have had Modes 10, 13 and 15 all offering 256 colours with increasing horizontal resolution. In terms of the old BBC Micro modes, MODE 10 is the same resolution as MODE 2, MODE 13 like MODE 1 and MODE 15 like MODE 0. This holds true on the Raspberry Pi and Beagleboard today.

The black sheep is the Iyonix. Because of the hardware restrictions all Modes are 256 colour modes and so understanding 256 colour theory is important on this machine. Whether you select MODE 2 or MODE 10 the resolution might be correct but you are forced to have 256 colours. Now, a choice of 256 colours might be a blessing, but equally they provoke oft-heard cry of "why are all my colours shades of dark red?!"

In the dim and distant days of the BBC Micro, it was decreed unto all Acorn users that there shalt be 16 palette registers. There were 16 colours in MODE 2 on the BBC and these corresponded directly to the 16 palette registers. The VDU 19 command was used to change the logical colour to an actual colour in the form

```
VDU 19,logical%,actual%,0,0,0.
```

For example, to change red (logical%=1) to blue (actual%=4) you used VDU 19,1,4,0,0,0.

On the Beagleboard and Pi (ignore the Iyonix for the moment) there are also 16 colours in MODE 2 and in other 16 colour modes like mode 12, so the above VDU 19 still works today. The three zeroes that were used as "padding" on the BBC are now used to specify the amounts of red, green and blue in an extended VDU 19 statement:

```
VDU 19,logical%,16,red%,green%,
blue%
```

where logical% is as before and red%, green%, and blue% are the proprotions of red, green and blue.

For example to make logical colour 1 (usually red) the darkest shade of blue possible you would use VDU 19,1,16,0,0,1, and to make logical colour 2 (usually green) a mid yellow VDU 19,1,16,128,128,0. Although any number zero to 255 is permitted, only eight distinct levels are recognised as we shall see.

Basic's extended COLOUR command works in exactly the same way. For instance COLOUR 1,0,0,1 and COLOUR 2,128,128,0 would achieve the same as the VDU 19 statements just mentioned.

This is all fine and dandy but what about the 256 colour modes? In MODE 10, COLOUR 1 is a dark red. Issuing VDU 19,1,16,128,128,0 seems to have no effect so what's going on here? Well, to start with there are still only 16 palette registers but 256 colours so some compromise has to be found.

Let us first of all examine the default VDU 19 settings for the 16 palette entries in MODE 13. This is done via Osword 11 whose parameter block requires the logical colour number to be in byte zero, and returns the red green and blue settings in bytes two, three and four.

Program 1 loops through the 16 logical colour numbers and displays the entries. A sample output is shown in Figure 1.

Selling on eBay with Netsurf

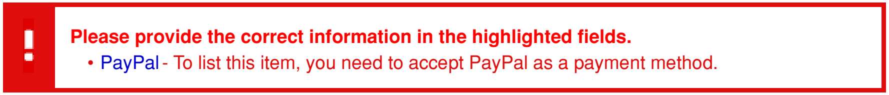
If you have been trying without success to list items on eBay using Netsurf then this article is for you.

You have probably got as far as typing in the description etc., pressing the Continue button, only to receive an error message:

Please correct the information in the highlighted fields.

• Paypal - to list this item you need to accept PayPal as a payment method.

This problem appeared a couple of years ago. Although eBay have been informed several times they seem reluctant to correct the bug.



Please provide the correct information in the highlighted fields.

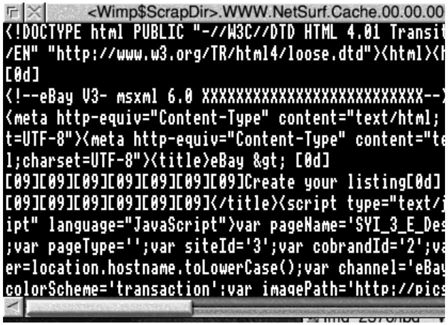
- PayPal - To list this item, you need to accept PayPal as a payment method.

Never fear because thanks to your favourite magazine we have a fix!

What needs to be done is to 'poke' the web page code so that when you press the Continue button the correct information is sent to the eBay server.

Start by listing your item as usual, then when you get to the problem page press F8 or click Menu > Page > View source...

A window will open showing the web page coding as shown in Figure 1. It is shown in SrcEdit but yours could be Edit or StrongEd depending on what text editor you normally use.



```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transit
/EN" "http://www.w3.org/TR/html4/loose.dtd"><html><h
[0d]
<!--eBay V3- msxml 6.0 XXXXXXXXXXXXXXXXXXXXXXXXXX-->
<meta http-equiv="Content-Type" content="text/html;
t=UTF-8"><meta http-equiv="Content-Type" content="te
l;charset=UTF-8"><title>eBay &gt; [0d]
[09][09][09][09][09][09][09]Create your listing[0d]
[09][09][09][09][09][09]</title><script type="text/j
ipt" language="JavaScript">var pageName='SYI_3_E_Des
;var pageType='';var siteId='3';var cobrandId='2';va
er=location.hostname.toLowerCase();var channel='eBay
colorScheme='transaction';var imagePath='http://pics
```

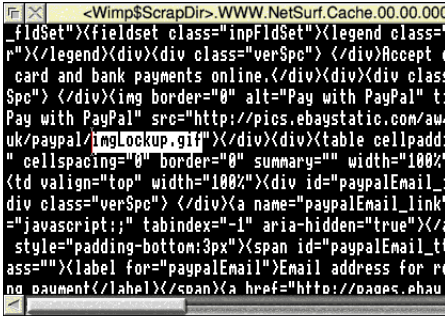
Figure 1.

Don't worry about the name of the file in the titlebar. It will be something like "<Wimp$ScrapDir.WWW.Netsurf. Cache.00.00.0001". This is just RISC OS making a temporary copy in its Scrap directory.

Now use the search or find option in your text editor to locate the text

```
imgLockup.gif
```

The caret will jump to the relevant position in the web page and highlight the text we are looking for (figure 3).



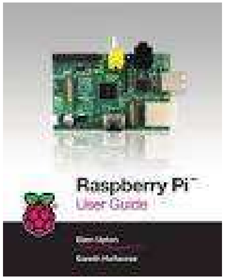
```
_fldSet"><fieldset class="inpFldSet"><legend class="
r"></legend><div><div class="verSpc"> </div>Accept c
 card and bank payments online.</div><div><div class
Spc"> </div><img border="0" alt="Pay with PayPal" ti
Pay with PayPal" src="http://pics.ebaystatic.com/aw/
uk/paypal/imgLockup.gif"></div><div><table cellpaddi
" cellspacing="0" border="0" summary="" width="100%"
<td valign="top" width="100%"><div id="paypalEmail_i
div class="verSpc"> </div><a name="paypalEmail_link"
="javascript:;" tabindex="-1" aria-hidden="true"></a
 style="padding-bottom:3px"><span id="paypalEmail_tt
ass=""><label for="paypalEmail">Email address for re
ng payment</label></span><a href="http://pages.ebay
```

Figure 2.

In case you're wondering "imgLockup.gif" is the eBay filename for the block of credit card logos with Paypal at the top.

Book Reviews

Title: Raspberry Pi User Guide
Pages: 248, Half-letter size
Authors: Eben Upton, Gareth Halfacree
Publisher: John Wiley & Sons
Publication date: September 2012
Price: £8.75 - £12.99
Stockists: Amazon, eBay, Maplin



This book is the nuts-and-bolts guide to the machine. Chapter 1 gives some historical background information on the ARM architecture, comparing and contrasting Windows and Linux. There is no mention of RISC OS but this is because the book was published before the official release of RISC OS for the Raspberry Pi. Other operating systems (but not Windows) can be installed on the Raspberry Pi. It's whatever you put on the SD card that goes in the front of the machine.

The Pi User Guide assumes you are using Linux - specifically the "Debian" version of it. The book is roughly three sections. First is concerning setting up and configuring the machine uner Linux, using basic Linux filing system commands, networking, and partition management. The SD card at the front of the Pi holds the operating system in one partition, and second and subsequent partitions act as your "hard disk" for storing programs and documents.

The middle of the book is concerned with using the Raspberry Pi as a media streaming box, getting hold of open-source word processing/ spreadsheet packages etc. which run under Linux.

The third section is a more in depth guide to programming and hardware. There is a chapter on Scratch, a children's programming language. The Raspberry Pi founders always intended the Pi to get children thinking about what their computer does instead of just using it like a domestic appliance. As far as we know, however, Scratch is only available in Linux. The chapter on Python, on the other hand, is relevant to RISC OS users as there is a RISC OS version available for free from www.python.org.

The final few chapters concern electronics and interfacing the Pi. Useful if you like gadgets and intend to do hardware projects.

Overall the book would be a good purchase if you are experienced in Linux as well as RISC OS.

Title: Getting Started with RISC OS on the Raspberry Pi
Pages: 16, A4 size.
Author: Christopher Hall
Publisher: C.K.Hall
Publication date: October 2012
Price: £4.00 - 5.00
Stockist: Lulu.com

This slim volume is the perfect bedside companion to RISC OS on the Raspberry Pi. The A4 format is a little cumbersome but it is written in a

Music writing with PMS

Part 1

Philips Music Scribe (PMS) is a music typesetting application. Any text editor (e.g. Edit) can be used and music is represented by Ascii characters.

The letter "a" for instance represents a crotchet A. Dots, tails, octave changes and other note ornaments are represented by additional punctuation marks. " c' "- is a quaver C an octave higher.

Almost every Ascii symbol is used, and all regular music - even some obscure modern music - can be typeset using PMS. In this article we'll typeset a simple line of music (one system).

PMS can be downloaded from finnybank.com/qercus/mags/2007/q281.htm. It was put into the public domain by Qercus magazine (which ran from 2004 to 2009). Follow these instructions to get PMS working in your Beagleboard and Raspberry Pi:

- Set the file type of d281-a/zip to "Archive" if it's showing as text. Click Menu over the file then File d281-a/zip Set type → and delete "Text" and type "Archive" and press Return.
- Double click to open d821-a/zip.
- Copy the !PMS application out of the archive to your chosen location on hard disc.
- Copy !Fonts into your fonts folder by using the Install fonts... option in Boot → Configure (drag the !Fonts directory onto the "Font Merge" window).

Additionally, Beagleboard owners must set Alignment Exceptions to off. CAUTION: if you have other applications running, quit them first.

Have a quick look at some of the scores provided in the d281-a/zip then close down the archive. Open a new window in your text editor.

The first thing is to tell PMS we want one stave:

```
[stave 1]
```

and press Return. That's stave number one (not a lower case L). Anything in square brackets are called *stave directives*. We also have to tell PMS what octave number we want to start in. This is done with the [treble n] or [bass n] stave directive, where *n* is the octave number.

Octave number one starts at Middle C, number two the C above middle C and so on. The octave below middle C is zero and any octaves below that are a negative number (-1 is two octaves below middle C).

We'll start in octave one. So we need the heading directives:

```
[stave 1] [treble 1]
```

or simply

```
[stave 1  treble 1]
```

Any number of heading directives can surrounded by one set of square brackets. I've left two spaces between between the "1" and the

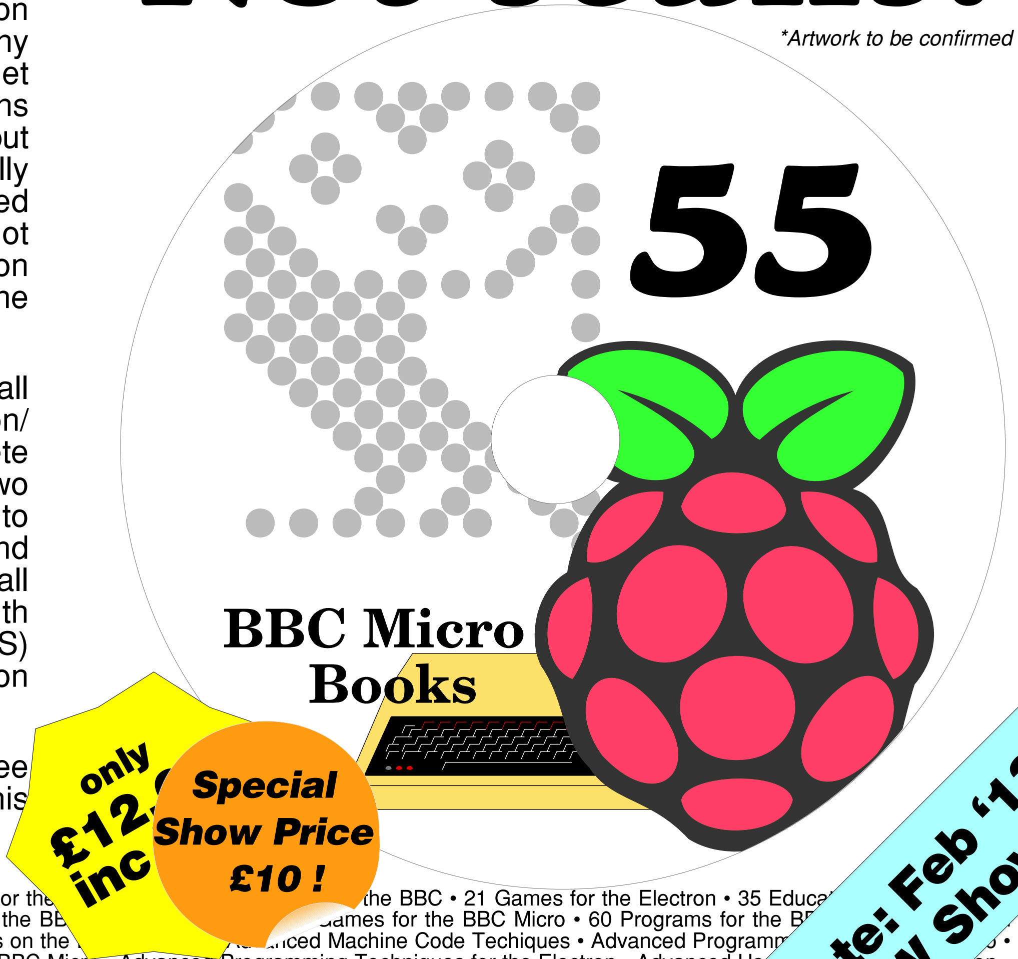
Not scans.

Over the past few years we've been busy putting together this astonishing collection of 55 BBC Micro and Electron programming books. Unlike any other collections on the 'net these aren't just scans packaged up in PDF format but very high quality digitally remastered and debugged editions – and you can run a lot of the Basic programs on modern machines like the Raspberry Pi!

The CD ROM contains all books in RISC OS Impression/ Easiwriter format (complete with fonts, Drawfiles etc.), two types PDF (fonts 'mapped' to the standard Postscript set and 'Type 1') plus HTML (all platforms) together with program directory (RISC OS) and disc images for use on emulators (all platforms).

For the full list of books see below...don't miss out on this amazing compilation!

*Artwork to be confirmed



Release Date: Feb '13
(RISC OS SW Show)

100 Programs for the BBC • 100 Programs for the
the BBC • 21 Games for the Electron • 35 Educa
the BBC Micro • 36 Challenging Games for the BB
Games for the BBC Micro • 60 Programs for the B
Basic Rom User Guide • Advanced Graphics on the
anced Machine Code Techiques • Advanced Programm
o •
Advanced Programming Techniques for the BBC Micro • Advanced Programming Techniques for the Electron • Advanced Us
ron •
The Basic ROM User Guide • Best of PCW Software • Brainteasers for the BBC and Electron • Creating Adventure Pr
Micro •
Creative Animation and Graphics on the BBC Micro • Creative Assembler How To Write Arcade Games for the BBC an
Graphics
on the BBC Micro B • Essential Maths on the BBC and Electron • BBC Micro Expert Guide • Games and Other Progran
Games BBC
Computers Play • The Electron Gamesmaster • Giant Book of Arcade Games • Graphic Art on the BBC and Electron
s and Sound •
Graphics on the BBC Microcomputer • Graphics Programming on the BBC • Graphito • Graphs and Charts
• Handbook of
Procedures & Functions • How to Write Adventure Games on the BBC and Electron • Instant Arcade Games • I
the Electron • The
BBC Micro Machine Code Portfolio • Making Music on the BBC Micro • Mastering Assembly Code • Microgu
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your BBC • BBC Micro Music Masterclass • PCW Games Collection for the BBC • Practical Programs for th
ro Programs in Basic •
Quality Programs for the BBC • The Second Book of Listings • The Super-User's BBC Micro Book • The
e BBC Micro Revealed •
Acorn Electron User Guide • Virgin Games for your BBC • Writing Educational Programs on the BBC an

HOW TO CONTROL YOUR RASPBERRIES – WITH THE MOUSE!

SPRITES

PART 4

LAST time in our sprites writing series we put several different multicoloured shapes on the screen. This time we'll look at moving sprites around the screen under keyboard (and mouse) control.

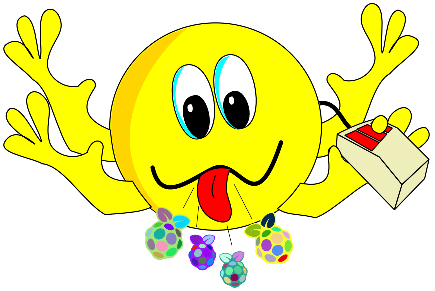
There's just one shape this time but it's quite big - 24 by 30 pixels. It's a raspberry for no reason other than it's quite topical piece of fruit at the moment! The data lines for it are shown in Listing 1. They are the same for all machines. The setup and plotting routines aren't and these are shown in listing 2a and 2b.

Remember, listing numbers suffixed "a" are for the Arc machines (Iyonix, Beagleboard and Raspberry Pi) and listing "b" for the BBC/ Electron.

If you have the programs from Part 3, dig them out to save youself some typing time because many of the lines are the same. The differences are that the start of screen Ram is automatically found via SYS &31 on the Arc, the sprite data area is dimensioned slightly larger, and the palette is redefined on the BBC/Electron version.

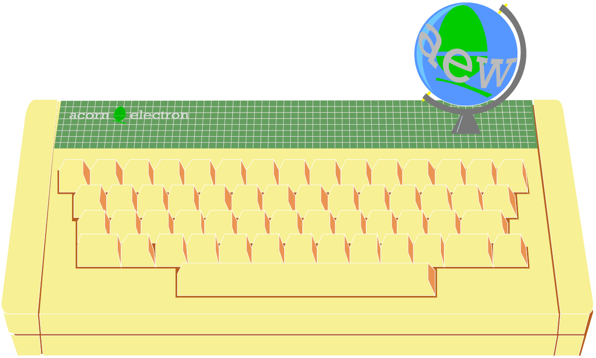
Listing 1

```
9000DATA 000003333000000033330000
9010DATA 000332223330003332223300
9020DATA 003222222233033222222230
9030DATA 003223222223032222232230
9040DATA 003222232222322223222230
9050DATA 003222222322322322222230
9060DATA 000322222233333222222300
9070DATA 000032222233333222223000
9080DATA 000003322333333322330000
9090DATA 000033333333333333111300
9130DATA 000313311113331111331300
9140DATA 003333111111311111133300
9150DATA 033133111111311111131130
9160DATA 031131111111311111131113
9170DATA 031131111113331111133113
9180DATA 031133111113331111133113
9190DATA 031133311331113313333113
9200DATA 003333333311111333311330
9210DATA 003311333111111133111330
9220DATA 003111133111111131111300
9230DATA 000311113111111131111300
9240DATA 000311113311111311111300
9250DATA 000031113333333311113000
9260DATA 000003333331113333330000
9270DATA 000000333111111133000000
9280DATA 000000003311111330000000
9290DATA 000000000333133000000000
9300DATA ""
9310DATA 0,0,0,0,END
```



Listing 2a

```
   10 REM Sprites 4 Program 2 for
Arc (Iyo, BB, Pi)
   20 MODE 13
   30 DIM col% 3, sprites% 750, co
de% 100,table% 31
   40 !table%=149
   50 table%!4=-1
   60 SYS &31,table%,table%+8
   70 addr%=table%!8:REM screen ra
m start address
   80 TINT2,0
   90 PROCsetupsprites
  100 PROCassemble
  110 FOR i=1 TO 30
  120 PROCsprite(0,RND(30)*10,RND(
15)*20)
  130 NEXT
  140 END
  200 DEF PROCsetupsprites
  210 store%=sprites%
  220 index%=0
  230 REPEAT
  240 FOR x%=0 TO 3
```



Acorn Electron world

Acorn Electron World is home to practically everything ever produced for the Acorn Electron - and those who doubt this should take a quick trip over to it.

2011 was a vintage year for the site, with the launch of AcornElectronTV, a YouTube channel featuring its flagship show Five Games Five Minutes, bringing a whole new generation of gamers back to the Acorn machines. 2012 has been a lot quieter though - with everything collected up, its webmaster's attention has turned to other projects.

But there have still been a few games written and recovered to make its webmaster, Dave E, wax lyrical. In this wide-ranging article, he talks about what's been recovered recently to what's being developed as you read . . .

Heyley Adventures

The Acorn Electron disk library was always very small. Only a small number of disk units were sold and there simply wasn't the market for software publishers to concentrate on distributing games on disk rather than tape.

Superior/Acornsoft did a few arcade releases (Codename: Droid, Bonecruncher, The Life of Repton and a few others), and the 4th Dimension did a range of text adventures (Acheton, Avon, Return to Doom and a few more) and, despite being very difficult to track down, they were duly found and archived over at Acorn Electron World many many years ago. HeadFirst PD's range of Public Domain games also came to light in 2009.

But one set of disks eluded even the most fervent of searches, and these were the Heyley adventures. Heyley was a two-man team which wrote a number of text adventures for the BBC in the early Eighties.

ACP/Pres then bought the rights to produce disk-based Electron versions of them, which they sold via mail order via the magazines of the era.

Unfortunately, the advertisements themselves were terrible, reading simply "Heyley Adventure Games on Disk, £9.95 each".

The odds against tracking down these disks, advertised without their names, available for just a few months, supplied without boxes and only catering to a market of a few hundred people, seemed miniscule.

The authors themselves had been contacted by both AEW and Stairway to Hell in an attempt to see if they had any of their own personal copies but they had confirmed that no, all the original disks were long gone.

Until this very year when who should step forward but one of the engineers from ACP/Pres who began an immediately intriguing thread on Stairway to Hell.

He had archived *all* ACP/Pres disks and projects when ACP/Pres finally closed its doors in 1991. And a few days later, at a stroke, the entire catalogue of Heyley adventure disks were found and uploaded, completing the Acorn Electron World disk archive in its entirety.

You heard it here first - Not a single disk for the Acorn Electron exists which is not available for download on the Internet.

Repton The Lost Realms

After perhaps the longest production schedule in the history of Acorn Electron gaming, Dave M's Retro Software label finally announced the

Varieties of Numerical Experience

Mathematicians and programmers are used to the fact that there are as many different sorts of number system as imagination and logic permit, though ordinary language hides this.

The finiteness of memory in a computer presents an immediate problem: only a finite number of numbers can be represented.

There are two obvious strategies for coping with this.

The first is to count in a circle - that is, use modular arithmetic. BBC Basic uses modular arithmetic with modulus 4294967296, which is 2 to the power 32, for integers.

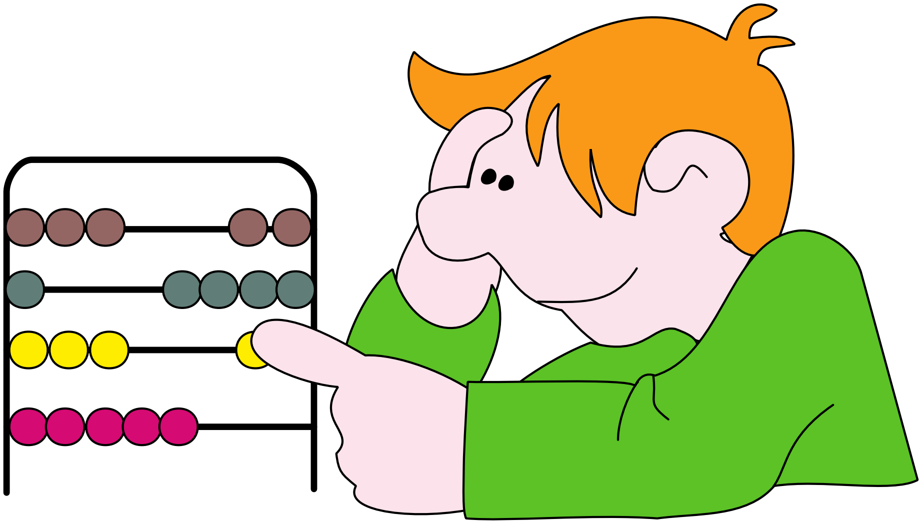
You will not get Basic to print this number out because it prefers to call it 0.

In fact it treats all the numbers in the range from 2147483648 upto 4294967295 as negative, as being the same range as -2147483648 upto -1.

The disadvantage of modular arithmetic is that there is no sensible (i.e. transitive) way of ordering numbers. The laws of arithmetic work fine for addition, subtraction and multiplication.

The second strategy is to count in a straight line but have an error condition for overflow. The disadvantages of this are:

- when overflow occurs may depend on the hardware and how much memory it has rather than on the language being used
- the laws of arithmetic will not hold for all values of the variables.



With RiscLua 5.50 (http://www.wra1th.plus.com/lua/) you have the choice of either approach.

You can have modular arithmetic, just like Basic, with modulus 2 to the power 32. To see this open a taskwindow by pressing Ctrl+F12, and type at the * prompt:

```
*lua
Lua 5.2.1  Copyright (C) 1994-2012
Lua.org, PUC-Rio
RiscLua 5.50
>
```

At the > prompt enter

```
> print ( 2^32, type (2))
0 number
```

But now try:

```
> two = bc.number '2'
> print ( two^32, type (two))
4294967296 userdata
```

Here we have defined two to be a `bc`-number. The type function declares this to be `userdata`, and

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