Loads of Hints & Tips

100% ACORN

Covering ALL Acorn machines

# Acorn COMPUTING

## EASY READERS

We scan two top OCR packages

**Font Special**
Helpful hints and tips for desktop publishers

**Graphics**
Esher's reptiles made easy – plus two great competitions

europress ENTERPRISE

MARCH 1994 Vol.12 No.1 £2.95 Hfl 14.50

ARCHIMEDES • A300 SERIES • A400 SERIES • A3000 • A3010 • A3020 • A4000 • A5000

Font Directory is the only font management application which contains a dedicated font filing system. All other programs work by simply swapping whole directories or moving font files from one folder into another.

Although writing and desiging a font filing system has taken more time and effort, it offers some additional benefits...

• **More flexibility** – Individual fonts (not just families or directories) can be installed and removed. You can also organise your fonts into categories, families and weights.

• **Saves space** – By using directories which only take up 2K, the space used by your font collection can be reduced.

• **Kind to discs** – Unlike some systems, font availability is controlled in memory and not by moving font files on the disc. This saves a lot of unnecessary disc access and speeds up the availability of your fonts.

• **No limits** – Well, not exactly... you can store over 5900 font families! And you can make many of these fonts available at any one time – typically over 700 font families.

• **Network friendly** – A special version of the software is available for network users. This allows each station to have a personal view of a central collection of fonts stored on a file server.

• **Star commands** – If required, star commands are provided to allow you to specify which fonts should be made available.

• **RISC OS compliant** – It works with both RISC OS 2 & 3 and is desktop compliant. As registered developers, the calls and messages provided are officially recognised by Acorn.

• **Well documented** – It comes with a 32-page printed manual which includes both a primer and a detailed description of the facilities provided.

• **Reviewed** – Here's what the reviewers say:

**RISC User, Jan/Feb '94:** *"This program provides the kind of facilities which should have been built into the operating system in the first place. It is very easy to use, and I find it utterly invaluable. Anyone who has more than a handful of fonts should buy it without delay. It is superbly presented, operates flawlessly, and has become a permanent addition to my iconbar."*

**Archive, Sept '93:** *"The real pièce de résistance is the facility to scan documents and files and install the fonts required automatically. This is a dream to use. I have always found it frustrating that Impression would simply replace all uninstalled fonts with Trinity without even giving the option to abort loading the document. Draw would replace unrecognised fonts with the system font. Now that is all a thing of the past.*

*I was very happy with Font Directory. I found it very easy to install and use with minimal reference to the manual... this is a highly intuitive application – a great deal of care and thought must have gone into its design and realisation. It integrates seamlessly with RISC OS and if you use a lot of fonts, you have to have Font Directory."*

LOOK systems

# Font Directory

## A font filing system

Hundreds of outline fonts are now available for the Archimedes and new fonts are being produced all the time. This is all very well, but it does mean that using and managing fonts is becoming increasingly difficult.

### What is Font Directory?

Font Directory is a radical approach to storing and using outline fonts within the RISC OS desktop. At its heart is a dedicated font filing system which provides the user with an unparalleled level of control.

### Easy-to-use

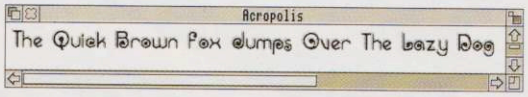
Using techniques pioneered by LOOKsystems, Font Directory allows you to install fonts at the click of a button without the having to restart your application.

Just select the fonts in the FontList window and click on the 'tick' icon.

(If you wish, you can specify which fonts will be available on start-up and save favourite lists of fonts for later use.)

### Font viewer

A preview window is available to help you decide which fonts you wish to install or just to remind you what a particular font looks like. If required, the text, size and colours used to display a font can be defined and even saved for later use.




### Document scanning

The most powerful feature, however, has to be the ability to scan other applications' documents. When a document is dropped onto Font Directory, the fonts used will be made instantly available.

At last, no more 'font not found' errors!

### FREE trial offer

Font Directory does a lot more than we can explain on a single page and so we are offering you the opportunity to try the software for free.

Just contact us at the address below and we will send you a complete pack. This can be returned within 10 days and you won't be charged a penny.

Otherwise, you can keep the software and we will invoice you for £35 inc VAT and UK P&P.

This offer only applies to UK residents.

**LOOKsystems, 47 Goodhale Road, Bowthorpe, Norwich, NR5 9AY.**
**Telephone: (0603) 748253. Facsimile: (0603) 764011.**

A hard disc is recommended and you will need enough space to store all of your fonts. Most major applications and file formats are supported.

April issue – on sale 5 April 1994

# OCR

FROM the printed word to computer text the route is long and arduous, but now two commercial packages will try to take it all the way. See how they do in our feature starting on Page 22.

## REGULARS


**Comment** 13
When is a product not a product? When it's soft, of course. In his examination of software copyright Steve Turnbull explains.

**News** 15
All the latest news of products and events taking place in the fast-changing world of the Acorn computer.

**TechForum** 55
Are you an expert programmer? Our hints and tips series is just for you, with ideas and algorithms to help you work.

**Public Domain** 65
Teri Paul is back again with her pick of public domain and shareware programs to enhance your computer.

**Mad Hatter** 72
Our adventure game wizard guides you through the intricacies of Fish! Plus lots more on Elite for 8-bit and 32-bit owners.

**Problem Solved** 75
Our technical editor opens his mail and shares the secrets behind some of those tricky hardware problems.

**Body Building** 77
All 8-bit BBC Micros had a user port but the 32-bit ones don't. Can the new bi-directional printer port take its place?

**Letters** 88
This is your opportunity to voice your news, ideas and views on everything in the Acorn world, from viruses to joysticks.


## FEATURES


**MegaDisk** 4
Check out what's in store for you this month on the best cover disk available for the Acorn 32-bit RISC OS range.

**32-bit Subscribers** 7
Our special extra subscriber's disk is jam-packed full of goodies, so find out what's on it this month.

**BBC Disk** 11
Full details on what's on the subscription disk for the 8-bit BBC Micro this month, and how to use it.

**About Fonts & DTP** 29
We look into typography and explain its terms, where you can get the fonts and how to use them to their best effect.

COMPETITIONS

**Win Loads of Fonts** 33
Yet another great competition – this time you can win a collection of a hundred Monotype fonts, plus the superb Font Manager program.

**Win 8Mb** 42
Your chance to have your computer upgraded to 8Mb if you win our easy to enter competition.

**Graphics** 52
Mike Goldberg turns his attentions to the vagaries of the British weather, in the first of a two part series.

**The Draw Guide** 59
Now you can discover how easy it is to use the built-in Draw module to produce interesting on-screen effects.

**Reptiler** 62
Reproduce the amazing, interlocking Escher reptiles, using the Draw module and this fascinating article.


## REVIEWS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Discover just how good the optical character recognition software for the Acorn machines actually is in this head-to-head comparison.

**Learning Curve** 35
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- Teddy Bear's Rainy Day
- Penfriend
- Noddy's Playtime
- Naughty Stories Volume 2

**Art20** 44
We check out this new art package and find out whether advanced facilities measure up to the existing opposition.

**SyQuest Hard Disks** 47
Removable hard disk technology is now available to Acorn owners for a really low price, check out how easy it is to install and use.

**Keyboard Trainer** 49
Learning to play the music keyboard can be a long and laborious task, find out if this software makes it any easier.

**Pro-Artisan 2** 51
We update our early look at the Pro-Artisan software with this examination of the production version, with complete documentation and added features.

**Programming Reviews** 57
We check a selection of programs and utilities especially for the programmer:
- Easy C
- Wimp Programmer's Toolkit
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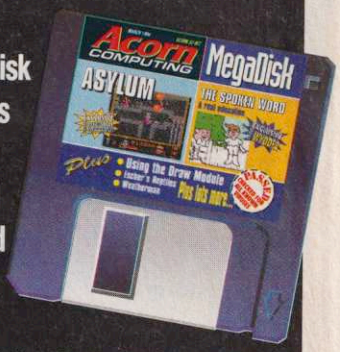
All systems go as we look at the latest for 32-bit Acorn machines:
- Lemmings 2 "The Tribes"
- The Nemesis
- Birds of War
- Dinosaw


## THE MEGADISK

Britain's best Acorn cover disk contains hours of fun and a host of useful utilities linked to our editorial features, to make the magazine come alive on your desktop!




Full details about the packed Megadisk – see Page 4.

- **Asylum**
  Very strange arcade action with Sigmund
- **The Spoken Word**
  Excellent new early learning package
- **Weatherman**
  Put your weather on the map
- **Draw Module**
  Discover how to use it
- **Escher's Reptiles**
  Create your own using the Draw module


## Subscribe now! – See page 46

SUBSCRIBE to *Acorn Computing* and you'll get an amazing value-for-money deal that beats all our rivals: Not only do you get a whole year's-worth of issues for LESS than any other Acorn magazine, 32-bit owners get TWO disks every month.

See Page 46 for details of this unbeatable offer.

If you have a BBC Micro, *Acorn Computing* is the only newsstand magazine that still supports you. Every month we have complete programs written specially for you and your computer.

To subscribe turn to Page 46.

**GET YOUR NEWSAGENT TO RESERVE YOUR COPY NOW – SEE PAGE 64**
**AVAILABLE AT W.H. SMITHS AND ALL GOOD NEWSAGENTS**

# The MegaDisk

## What's on this month

- Asylum
- The Spoken Word
- Programs from the magazine

## Asylum: With adventure in mind

Young Sigmund has a few problems. To help him resolve his mental instability you must enter the surreal world of his inner mind and shut down the malfunctioning brain cells which are causing him these problems.

This special version of Asylum contains a small sample of the Psyche – the medium difficulty level – but the complete game has a total playing area over 35 times the size. The full version costs £21 from Digital Psychosis, 14 Madingley Road, Cambridge CB3 0EE.

You can use Acorn-standard joysticks – if you have another model which doesn't work with the game you should contact the supplier to see if they can help. With a joystick, you can choose one of the mouse buttons as the jump key using the Define Controls – Keyboard option.

There are lots of options to select when the game starts up. Most are self explanatory. Here are a few which aren't:

- Speed tweaks – there are a lot of different Acorn machines available, which vary in their computing power. The game will look at the machine when you first play it and select the ideal combination. You may change these if you wish. Ticked options require more computing power.
- Normal/high quality sound – high quality sound takes more computing power.

RISC OS 2 owners will need the Shared C Library 3.5 or greater. If you have been updating your !System with the SysMerge utility on every MegaDisk you will have Shared C Library 3.75. If not, you can find this module on a previous MegaDisk.

Watch out for rats and bombs and may the *id* be with you.

● *Got your gun, found a friendly teacup, so let's go fruit picking*

● *Just think – this is your mind you're blowing up*

● *Some days nothing goes right*

## FAULTY DISK?

If your cover disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

**PC Wise Ltd**
**Dowlais Top**
**Business Park**
**Dowlais**
**Merthyr Tydfil**
**Mid Glamorgan**
**CF48 2YY**

If there seems to be a fault with one of the programs please contact us by post describing your machine set- up and exactly what happens when you run the program.

## Getting started with the MegaDisk

THE programs on this disk are stored in a highly compressed format which sometimes enables as much as 1.6Mb of programs and data to be stored on a 800k floppy disk

The procedure for running the programs is very straightforward and does not require learning any special methods or techniques.

Switch on your Acorn micro, put the disk in the drive and click the drive icon. Now double-click !ACmenu – there's a short pause while it scans the archive then it displays a window of the contents. You can treat this new window like any other one for viewing disk contents, and run programs and open directories by double-clicking them.

Large programs must be unpacked by dragging on to a separate disk before being run. Some may have an !Install program that will do it for you.

We recommend that you always read the !ReadMe files or access the help information via the Help button.

## The Spoken Word: Reading with Acorn

The Spoken Word is a colouring program that encourages children to read. To use it, double click on the program's icon or on the Pig stencil file. In the full version of the program there are numerous scenes already created plus the ability to build your own pictures and add sounds.

The iconbar menu lets you customise the program to some extent, letting you fix the window to keep young fingers from the rest of the computer. You can also decide if you want the child to click on the word *flowers* or on the item itself.

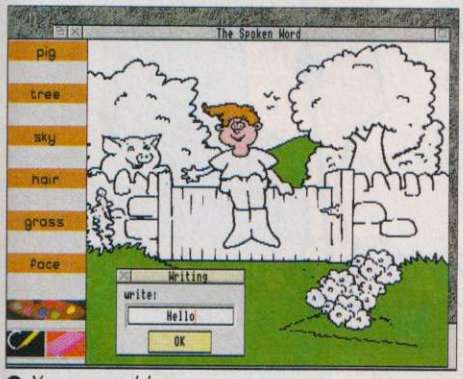
The child can then choose a colour from the painter's palette – the colours are all in word format – and click on *pig* or on the word *pig*. Each time you choose the computer will write and speak the word: *pink, pig, pink pig*. Space restrictions on our MegaDisk means that you can't colour all of the picture.

You can also add your own words to the picture which can be saved and printed as you will. The full version of the Spoken Word comes from Wyddfa (0286 870101) and costs £22. However, just for readers of *Acorn Computing*, there is a special offer – £11 for the full version of the program.

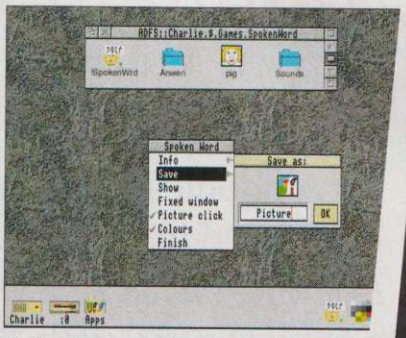
This program needs 2Mb ram to run and works best unarchived. You'll also need to add the Anwen font to your !Fonts directory. To do this find !Fonts and hold down Shift as you double click. Now drag Anwen inside and reboot the machine.

To run the program double click on Spoken Word and drag the Pig file on to the icon on the iconbar. A number of options are available allowing the program to speak the names of objects as you click the picture or just the words. Experiment to find which suits the child's needs.

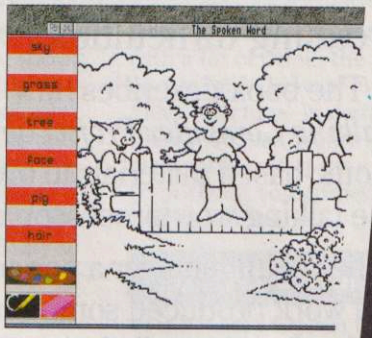
The finished picture can be loaded into Paint for further colouring or into a DTP package to allow you to write a story about the boy and his pig.



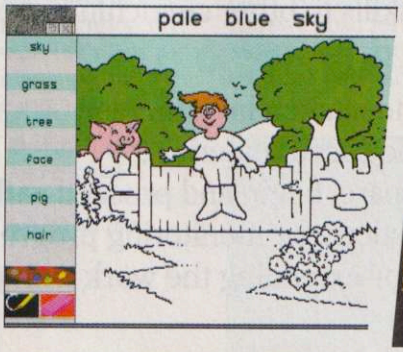

● *You can add your own words to the picture*




● *Save your work as a spritefile for further work*



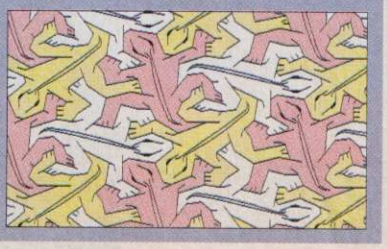

● *Explore by clicking with the mouse*




● *You choices are read out aloud*

## Programs from the magazine

- **Draw:** Illustrations from Draw article on page 59 showing how to use this application in your own programs
- **Graphics:** The first part of Mike Goldberg's weather program allowing you to chart your own weather. For details see page 52.
- **Reptiles:** Escher's reptiles program using the Draw module to explore this fascinating conundrum. Save and print the results to astound your friends. Page 62.



## Next month

Though we planned to feature Simon the Sorcerer on this month's MegaDisk programming problems have meant that this new adventure has been postponed until the April issue of *Acorn Computing*.

Here are some snapshots of work in progress to whet your appetite:

## ArcFS – Latest version 2.23

If you have the read/write version of Mark Smith's ArcFS you may have been experiencing some problems loading the MegaDisk. Mark has changed the filetype of the latest versions – which is what we are using for the MegaDisk. If you don't plan to update your read/write version, then when you click on the floppy drive to load the MegaDisk hold down the Ctrl key. Then double-click on the ArcFS on the MegaDisk, then the menu icon. The programs will then load without error.

*Following* TALKING PENDOWN
*the software that speaks for itself . . .*

# The Somerset Talking Computer Project Learning Materials . . .

Up to 37 months increase in reading age in just 6 hours work

. . . A phonic-based pack of materials to be used in conjunction with *Talking Pendown* - a wordprocessor complemented with "Speech" software - to help children with reading difficulties.

The book describes how *The Somerset Talking Computer Project* developed and used phonic-based materials to investigate the potential of the talking wordprocessor.

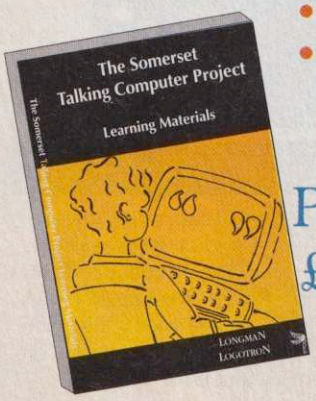
In little more than six hours tuition over a period of four weeks, a structured programme of work produced some remarkable results in pupils from a variety of schools across all phases of education.

Initial piloting results indicate:

- an average increase in reading age of 8.3 months;
- best result achieved an increase of 37 months;
- an average short-term memory improvement of 16 months;
- recognised improvement in spelling;
- observed increases in concentration span and time spent on-task;
- enhanced self-esteem;
- subsequent transfer of skills to other curriculum areas.

The book includes:

- a résumé of the work undertaken in Somerset;
- the photocopiable phonic-based materials;
- advice about how to prepare, begin and proceed with the work;
- suggestions for monitoring progress;
- ideas for extending the work with pupils.




Price:
£29.00
(+ p&p £3.53)

*"Struggling readers in Somerset have recorded a year-and-a-half's progress in only four weeks as part of a new research project into the benefits of 'talking' computers"*

Times Educational Supplement 19.2.93

Longman Logotron
124 Cambridge Science Park
Milton Road
Cambridge, CB4 4ZS

Tel: (0223) 425558
Fax: (0223) 425349

## Flight simulation – Take to the skies

There are two flight simulators on the subscription disk this month and both take you around the lowlands of Scotland and were designed using the Flight Simulator Toolkit from Simis. You will need a 2Mb machine to make these journeys though.

There is a *world* 100km by 100km to explore which represents central Scotland. As much as possible, objects within this world map some real features of the lowlands landscape – Loch Lomond and its dominant mountain, Ben Lomond, the Campsie hills to the north of Glasgow, as well as many other large scale features like Carron Reservoir, the Forth Rail Bridge and the Erskine Bridge.

Many, though by no means all, roads are included. Motorways like the M74, M8, M80 and M9, along with more minor roads can be followed as aids to navigation.

Some tower blocks and house-type buildings are in, as well as the occasional gasometer and football ground. A couple of major roads have trucks driving along them and a convoy of boats can be found sailing up the Clyde.

The detail is not consistent in any way, but has evolved based on my own interest in flying and what I wanted to see from the cockpit. There is, however, a hefty amount of detail to fly around. Since I live in Glasgow and fly from Cumbernauld, much detail is focussed around these areas.

Within the area there are six facilities for landing a fixed wing aircraft – that I know of – Cumbernauld, Edinburgh, Fife (Glenrothes), Glasgow, Prestwick and Strathallan Airfields.

The Cumbernauld runway, both runways at Glasgow and the two major strips at Edinburgh are shown accurately in size and position, other runways are in position only.

● *Pre-flight checks done, the StarDust is ready*

Each airfield has a beacon to aid navigation to it, but the aircraft you are flying is not equipped appropriately. Cumbernauld runway 26 is the starting runway so take off will roughly be due west.

**The Beacons**

0 Cumbernauld Airport
1 Glasgow Airport
2 Edinburgh Airport
3 Strathallan Airfield
4 Prestwick Airport
5 Fife Airport (Glenrothes)
6 Denotes the position of a DME beacon in the Borders

Since the purpose of the simulator is to mimic civilian airspace, there are no enemy aircraft to fight. Despite this, most of the building-type structures – though not roads or rivers, but hangers and tower blocks – are easily destroyed with cannon fire.

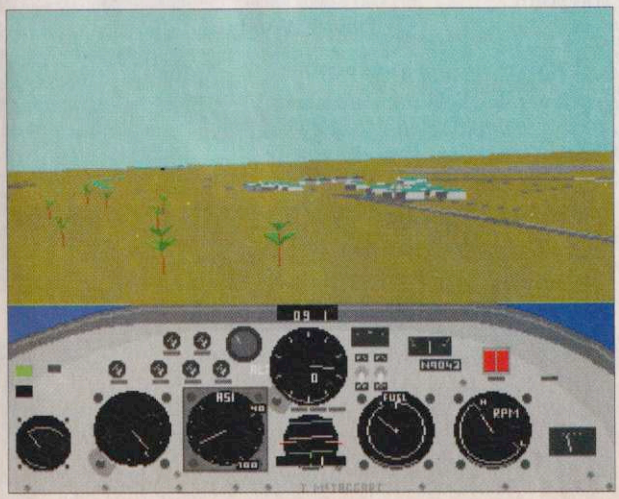
You may land on all the roads if you wish, though many are quite narrow and require some skill to get on to. When flying around areas with a lot of detail, the screen update rates decrease even on an ARM3 machine. In certain cases, the sheer workload on the machine makes the 3x 'fast time simulation' go unstable, sometimes with spectacular results.

### Flying the StarDust

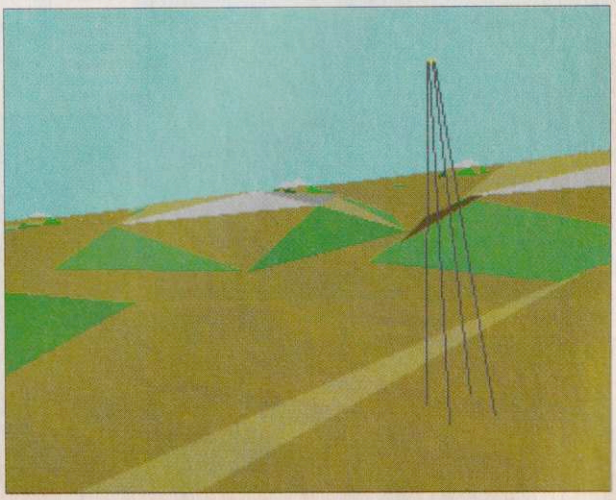
At the start, when on the runway, use Z to zero the mouse control before you begin to move. The engine runs when you begin but to start and stop you must use the following controls:

| | |
|---|---|
| W | takes the wheel brakes off |
| Z | zeros the mouse |
| E | Engine on/off |
| = | revs up |
| Shift+= | full power |
| - | revs down |
| Shift+- | idle power |

Once you are rolling down the runway push forward on the mouse slightly to bring the tail up, then pull back when the ➤



● *Water, trees and a small town – I wonder where we are*



● *Whoops, watch out for the transmitter*

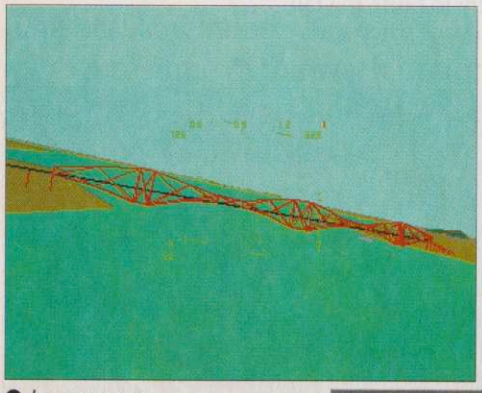
### What's on this month

- Two flight simulators – StarDust and WarJet
- 8-bit programs – run on your BBC or Master via a serial link or under the !65Host
- Body Building – the software for Mike Cook's Telescope project
- Public Domain software – Teri Paul's choice this month
- Reviews Index – who said what about which product and when

speed reaches about 70 Knots. The nose of the plane should rise and you may hear the wheels skate over the tarmac as the plane lifts. You should now be flying successfully.

| | |
|---|---|
| Control+E | emergency eject, in case you get into trouble |
| < | rudder/steer left |
| > | rudder/steer right |
| Adjust | fire 30mm cannon (500 rounds) |
| A | auto-stabilisers – useful for long flights |
| N | engine noise on/off |
| Q | all noise on/off |
| Pad 8 | view forward with instrument panel |
| Pad 5 | view forward without instrument panel |
| Pad 1,2,3,4,6,7,9 | other views |
| V | Vantage point from outside the aircraft looking at it. The view direction can be altered from the numeric keypad. |
| O | View the plane from the control tower and up to 10km away. Allows you to 'radio control' from the tower |
| P | pause |
| X | fast time simulation on/off |

This flight simulator is based on a Stolp *Starduster Too*, a modern biplane designed with the best characteristics of the classic age of the biplane in mind, owned and operated by Jim McTaggart. It is very capable of advanced aerobatics and is often seen at many air displays in Scotland.



● *Journeys are faster in the jet. Here's the Forth Bridge already*

● *A safe place to land, but I'm not at my destination*

## Flying the WarJet

If you decide to opt for the WarJet simulation the initial controls are the same. However, you'll also have a head-up display (HUD) giving you the following indicators:

| | |
|---|---|
| Top left | Airspeed – knots |
| Top right | Altitude – feet |
| Bottom right upper | G-force |
| Bottom right lower | angle of attack |

Small central cross nose direction – where plane is pointing
Large central cross velocity vector – where plane is going
Across top heading display
Through-display pitch bars – always stay parallel to horizon
Bar on right vertical speed indicator

This time when taxiing down the runway, pull back on the mouse when the speed reaches about 140 knots. Remember, this plane also has landing gear. Use L to toggle it up and down. The landing gear can be used to slow the plane, as can the airbrakes which are turned on and off by B.

**Weapons**

Weapon stocks are shown on the left of the instrument panel.

| | |
|---|---|
| Adjust | Fire 30mm cannon (500 rounds) |
| Menu | Fire rocket systems |
| Backspace | Select current rocket weapon system |

The available rocket weapon systems are:

Unguided rockets (25 pairs)
Air to Air heat seeking missile (50)
Air to Ground radar guided missile (50)
Return designates the target

● *Dogfight over Rangers, or is it the Celtic ground*

The last two must have targets designated, and a *track box* in the HUD indicates successful designation. The range to target is on the radar display and this should roughly be where the plane is pointing for best chance of a hit. If missiles are being fired at you, flares and chaff can be used as decoys.

| | |
|---|---|
| F | Drop flares |
| C | Drop chaff |
| / | Change radar range |

When it comes to navigation you'll need the VOR which is at the lower centre left of the instrument panel. A green/red line running through it shows the direction to the selected waypoint. There are four waypoints programmed into the nav computer:

| | |
|---|---|
| ; | Select waypoint |

A waypoint is flown towards by turning the aircraft until the green portion of the compass indicator points upwards. A red bar on the heading strip at the top of the HUD shows the current bearing to the waypoint.

**David Woods**

*NB: On ARM 2 and ARM 250 machines the flight simulators take 30-40 secs to initialise after loading has finished – but they do work.*

## FAULTY DISK?

If your 32-bit subscription disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

**PC Wise Ltd**
**Dowlais Top**
**Business Park**
**Dowlais**
**Merthyr Tydfil**
**Mid Glamorgan**
**CF48 2YY**

If there seems to be a fault with one of the programs please contact us by post describing your machine set- up and exactly what happens when you run the program.

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TopicArt9 - Dinosaurs

Subjects available
1 - General
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9 - Dinosaurs
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TopicArt12 - AnimalsGB

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| | |
|---|---|
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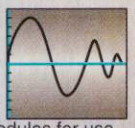

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Come and visit our showroom, most Acorn systems and software on demonstration.
Open Mon-Sat 10.00 to 18.00 hours.

## Hardware, Software & Books (All prices exclude VAT)

### Pocket Book/Psion

| | |
|---|---|
| Acorn Pocket Book | £169 |
| Psion 3 256k | £175 |
| A-Link for either of the above | £51 |

### A3010 Series

| | |
|---|---|
| Action Pack | £336 |
| TV output, 1Mb RAM, FD, Zool, WP | |
| Learning Curve System | £620 |
| 2Mb RAM, Monitor, Advance, PCE | |

### A3020 Series

| | |
|---|---|
| Floppy Disc System | £660 |
| As above less Lng Crv & joystick prts | |
| 60Mb Hard disc System | £800 |
| As above with 60Mb Hard disc | |

**Add £43 for AKF52 MultiScan Mon.**
**Add £107 for AKF50 0.28dp Monitor**

### A4000 Series

| | |
|---|---|
| A4000 2MHD80 Syst | £830 |
| 2Mb RAM, Floppy Drive, 80Mb hard disc, std mon, EasiWriter2, database. | |

**Add £43 for AKF52 MultiScan Mon.**
**Add £107 for AKF50 0.28dp Monitor**
**For 1Mb 386 PC card add £250**
**For 4Mb 486 PC Card add £450**

### A5000 Series

| | |
|---|---|
| A5000 2MHD80 Sys | £1250 |
| A5000 4MHD160 Sys | £1420 |

**Add £200 for Microvitec CubScan**
**Add £64 for AKF50 0.28dp Monitor**

### Learning Curve

**Learning Curve Software Pack £42**
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### Home Office

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### Acorn A4 Series

**Free Sh. Bag, Sp. Batt,PCE**

| | |
|---|---|
| A4 4MHD Portable | £1649 |

### Monitors

| | |
|---|---|
| **Acorn Standard AKF17** | **£170** |
| Acorn Standard/MultiScan | £210/£259 |
| **Microvitec Cub Scan 1440** | **£389** |
| **0.28dp, 40 presets & 3yr Warranty** | |

### Hardware Upgrades

| | |
|---|---|
| ARM3 (25MHz, Inc FPA socket) | £159 |
| **Joystick Interface (all m/c's)** | **£28** |
| Midi Expansion Card | £65 |
| **Powerpad (dual) (Gamesware)** | **£34** |
| Scanlight Video 256 | £215 |
| ScanLight Professional | £549 |
| Vision Digitiser Col. Int £99/Ext | £112 |
| Hi-Vision Digitiser A5000(1 only) | £129 |
| Vision u/g's Mono-Col £70 Col-Hi | £60 |
| Mono-Hi | £120 |

### RAM Upgrades

| | |
|---|---|
| A3000 Up to 2Mb | £55/4Mb £129 |
| A3010 Up to 2Mb | £45/4Mb £149 |
| A3020/A4000 Up to 4Mb | £89 |
| A5000 Up to 4Mb | £89 / 8Mb £349 |
| A400 RAM | £35 per Mb |

### Hard Discs/MagOpt

The following are complete systems.

| | |
|---|---|
| **IDE Archimedes** | **Internal / Ext** |
| 250Mb 13ms Cache | £295 / £375 |
| **IDE A5000 2nd Internal Drive** | |
| 250Mb 13ms Cache | £219 |
| 330Mb 13ms Cache | £329 |
| **A3000 HCCS HardCards** | |
| 20Mb + User Port | £179 |
| 80Mb + User Port | £309 |
| **A3010 HCCS HD Multi-Podule** | |
| 20Mb + User Port | £222 |
| 80Mb + User Port | £339 |
| **SCSI Archimedes Internal** | |
| 120Mb 18ms Cache | £319 |
| 200Mb 18ms Cache | £409 |
| **SCSI 128Mb Magneto Optical Drive** | |
| 128Mb Internal Mag-Opt Drive | £549 |
| External case for above | £69 |
| 128Mb Mag-Opt Blank Discs | £35 |
| **SCSI CD-ROM Drives (Excl Card)** | |
| Ext Toshiba caddy loading | £399 |
| CD-ROM 330kb/s with 200ms access | |
| Ext Toshiba tray loader 350ms | £319 |

### Printer Consumables

| | |
|---|---|
| BJ-10/BJ-200 Ink Cartridge | £18/£19 |
| BJ-300 Ink Cartridge | £14 |
| BJ-600 Black/Colour Cartr. | £7/£8 |
| BJ-800 Black/Colour Cartr. | £18/£21 |
| DeskJet500 Mono/Col Cartr. | £23/£24 |
| Swift24 Mono/Col Ribbon ea. | £7/£15 |

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| | |
|---|---|
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| Canon BJ-10 Sheet Feeder | £50 |
| **Canon BJ-200 / Turbo** | **£250 / £285** |
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| Canon BJC-800 Turbo | £1299 |
| HP LaserJet 4L (300dpi) | £529 |
| HP LaserJet 4 (600dpi) | £Call |
| Laser Direct HiRes4 (free Imp II) | £799 |

### Books (No VAT)

| | |
|---|---|
| A540/A5000 Tech Guide (ea) | £65.00 |
| Acorn BBC Basic Guide | £19.95 |
| **Acorn RISCOS3 PRM's** | **£99.00** |
| **Add £7+VAT carriage for PRM's** | |
| Acorn 1st Word+ Manual | £10.00 |
| Acorn AASM Manual | £25.00 |
| Acorn ANSI C v4 Manual | £25.00 |
| **Archi Game Maker's Manual** | **£14.95** |
| **Begin's Guide to WIMP Prog** | **£12.95** |
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| **DTP on the Archimedes** | **£12.95** |
| **Add £1+VAT Carr. to above books** | |
| **First Impressions (inc discs)** | **£35.00** |
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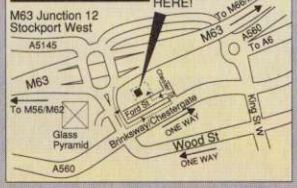


### Application Software

| | |
|---|---|
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| **Almanac3 (Stallion)** | **£67** |
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| **Investigator 3 (Vertical Twist)** | **£47** |
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| MasterFile III (RISC) | £47 |
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| **S-Base Personal (Longman)** | **£120** |
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| **Sleuth (RISC Dev)** | **£47** |
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| **Squirrel 2 Database (Dig Ser)** | **£130** |
| Superior Speech! | £15 |
| Titler (Clares) | £119 |
| **TurboDrivers BJ or HP (CC) ea.** | **£42** |
| TypeStudio (Beebug) | £43 |
| Vector (4Mation) | £75 |
| Worra CAD (Oak) | £83 |
| **WordWorks (CC)** | **£39** |
| Wordz (Colton) | £77 |

### Games Software

| | |
|---|---|
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| Axis (TBA Software) | £19 |
| BattleChess (Krisalis) | £22 |
| **Birds of War (4D) 2Mb** | **£25** |
| Black Angel (4D) | £25 |
| Break 147 & Superpool (4D) | £25 |

### Games Software (Contd)

| | |
|---|---|
| **Carnage Inc (4D)** | **£18** |
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| Pandora's Box (4D) | £18 |
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| Populous (Krisalis) | £22 |
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# Cybernetic scroller

## Cybot: Classic game in a new guise

A PEACEFUL, though rather automated society dwells happily in the land of Sil. But the inhabitants are not your normal carbon-based types – they're advanced robots. All was well until a terrible shadow fell across their land.

This particular shadow took the form of a monstrous toilet, it travelled the land flushing every robot down the drain – well, nearly all of them. One remained, Fred, and you must travel about, rescue the remains of your people and restore them to operability.

Cybot uses the full facilities of the BBC Micro, running at 50 frames per second with super smooth sideways scrolling, high resolution graphics and addictive gameplay. It's got four channel music, four baddies, four worlds and so on. It uses a special format letterbox screen – which unfortunately means we can't show any screenshots here.

The controls are very simple – Z for left, X for right and Return to jump. Avoid the baddies, collect the spheres and don't fall off the screen. If you collect every sphere on the level you can exit through the door at the end. Have a nice time.

**Julian Brown**

### FAULTY DISK?

If your subscription disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

**Datapulse Disk**
**Unit 5**
**Station Road**
**Hungerford**
**Berkshire RG17 0L7**

If there seems to be a fault with one of the programs please contact us at the magazine by post describing your machine set-up and exactly what happens when you run the problem program.

## Spell: Create your own personal dictionary

THERE are spell checkers for the BBC Micro, but like spell checkers on any computer they are not specific to your needs, they list words that you would never even dream of using.

This useful little utility, if used correctly, can create your very own personal dictionary, one which applies only to the vocabulary you use when writing with word processors.

It works by reading through specified text files and comparing individual words with the ones it has already accumulated. If it cannot find the word you may choose to add it to the dictionary, or ignore it. If it is spelt incorrectly, take a note of the word, re-enter your word processor and correct the spelling.

You'll need a blank formatted disk, and must select the Create dictionary option from the main menu. It takes about three and a half minutes to create all 26 blank files on DFS. I strongly advise the use of DFS because ADFS is incredibly slow.

The program assumes the disk is formatted to 80 tracks. If the disk is 40-track format, load *Spell* after typing PAGE=&1900 and change the &FFC in line 510 to &CFC, and save by typing:

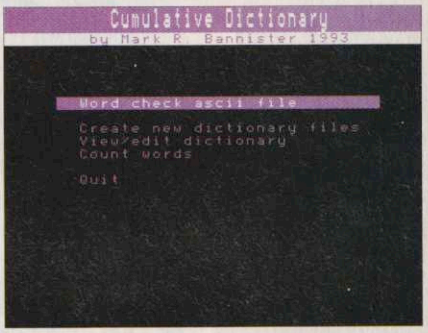
```
*SAVE SPELL 1900+1C3B FFFF1907 FFFF1900
```

The utility has had machine code entered after the REM statement in line10, so CALL&1907 as well as *SPELL (or */SPELL) will run the program. The dictionary files are named from _A to _Z. If they already exist, the creation routine will not destroy them.

The first option on the main menu after typing *SPELL will prompt for the filename of the textfile to spell check. It is important that the file you wish to spell check is accessible and that the filename includes the drive number and directory, if these are different to the current. You are then asked if you want unknown words to be automatically added to the dictionary.

If you say no, do you want the accumulation mode? This will simply store all the unknown words in the memory and display them after the whole file is checked, instead of as each unknown word is discovered – this allows you to go and make a cup of tea while the file is being spell checked.

The third option (View/Edit dictionary) will allow you to see the contents of the dictionary and edit it if necessary. The operational keys for this mode are displayed below.



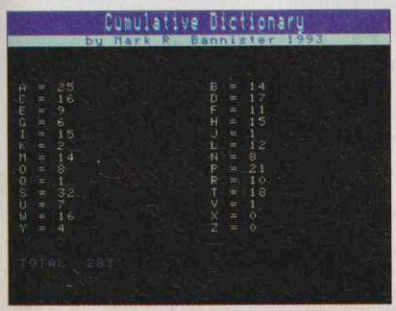

● *All the options you need*

The fourth option (Count words) will display the number of words in each of the 26 dictionary files, followed by the grand total of words in the whole dictionary.

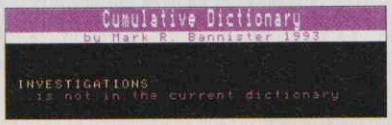
That should be all you need to know. It shouldn't take too long before your most common words are all in the dictionary. If you ever have the error *Can't extend*, it means that one of the dictionary files is full and the DFS cannot extend it because another file is in the way.

Copy the alphabet file to another disk, delete it, compact the disk and copy the file back again. Run the spell checker and it should now work.

**Mark R. Bannister**




● *After scanning just 2000 words the dictionary is building up*




● *Adding a new word during a text scan*

| Key | Use |
|---|---|
| 1-9 | Select the displayed word for alteration or deletion |
| A-Z | Move viewer to the beginning of a specific letter file |
| @ | Move viewer to next screen |
| + | Add a word to the dictionary |

### Next Month

Next month's amazing BBC Subscription disk will contain a game called Colony ... but it looks very much like something involving Lemmings! Don't miss it! Subscribe on Page 43.

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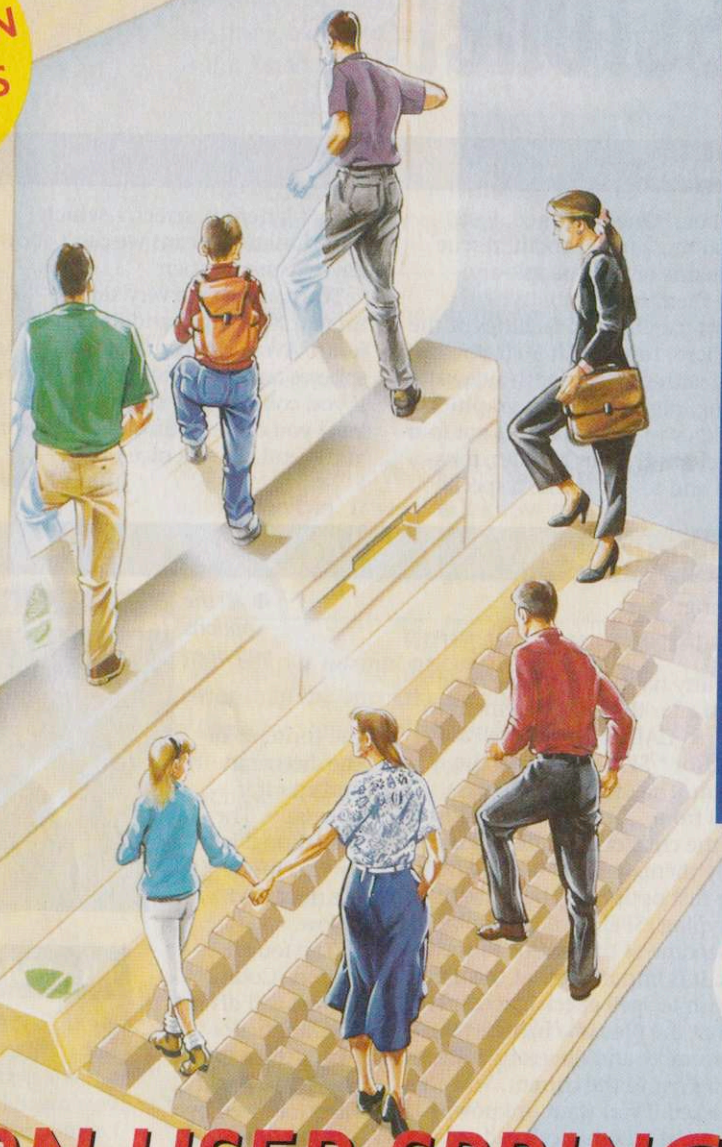

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# The right to use

**PROGRAMMERS are artists and just as there are a multitude of types of musician, there are different sorts of programmer. There's the commercial programmer who writes to order whatever his bosses demand, then there's the pure programmer who just creates the way he feels.**

Every programmer has his own style too. Given a piece of code to look at, it's possible to recognise stylistic differences in the way certain ideas are programmed.

The comparison between composing music and composing software is very close indeed. A composer can create a tune and write it down, but someone else can come along, listen to it, create something that uses the same chords and melodies and sell that. In programming someone can pull a program to pieces to see how a clever piece of coding was done then duplicate it himself.

Of course, unlike music, there are specific programming algorithms – good ways of performing certain programming tasks – these are published in books and papers and anyone can use them – usually.

One on-going controversy is the problem with LZW compression. This is a very clever, very fast system of compressing information and the algorithm for it was published in a paper a few years ago. What the authors of the paper failed to do was mention that they had applied for a *patent* on their idea.

Patents take years to go through and within months everyone was using LZW techniques to compress their data. This could prove interesting.

But the more serious problem is, of course, piracy, where someone copies the software and sells it on, keeping the profits for himself without the knowledge of the author. This is a problem with what we might call *soft products* – whether software, music, video and, to a lesser extent, the written word.

Copyright is the thing that protects the owner of a soft product (not necessarily the author) but it can be difficult to find the pirate. However piracy is not just full-scale illegal duplication, it's giving a copy to a friend too.

The justification for this often runs along the lines of *I bought it so it's mine and I can do what I want with it*. This type of thing works fine for *hard products*: If you buy a dishwasher you can sell it to someone else and you haven't got it anymore. But with a soft product you can buy it, give it away but still have it.

This is where *registration* and *licensing* comes into the picture. With unprotected software what you usually buy nowadays is a *licence to use* – you are not buying the software itself.

By opening the packet or running the registration part of the software you are agreeing to the licensing conditions which say something like, *the software can only be used on one machine at a time*. Of course a *site licence* allows the software to be used on more than one machine at a time, but only at one specified site.

Supposing you want to sell your software? Well you can't, it doesn't belong to you, you only have the right to use it. What you should be able to do is sell that right, the licence.

But there's a problem – if you don't fill in the registration form the company has no knowledge that you bought the software, and without that proof you cannot pass the software on.

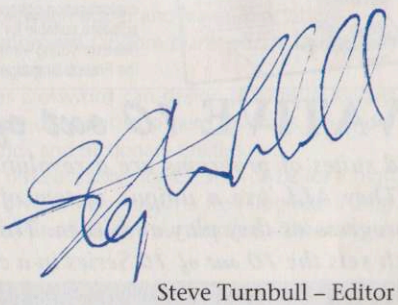
Some companies do allow registered software to be re-registered to someone else but, understandably, they require proof that the transfer has genuinely taken place.

So if you think you might want to sell the software (or rather, your right to use) in future, you must send off your registration form *and* keep the original disks and packaging.

On a slightly different note, but still in the area of copyright, is the subject of Public Domain. It's common practice in the Acorn market for so-called PD programmers to put limitations into their text files, like *you mustn't do this or that with my software*.

Well, I'm sorry to say that the moment anyone puts any restriction on it – *it ain't PD no more*. It may be free but *PD* means that it's been given away and the author has no further hold on it whatsoever. So call it Freeware if you want but not PD.

**Steve Turnbull examines the idea of software as a product**



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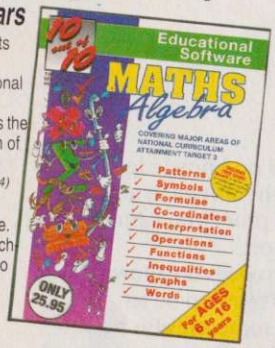
# The *10 out of 10* Series

*Rapidly becoming Britain's favourite choice in educational software*

Try it FREE!

## Maths (Algebra)

*For children 6 to 16 years*




THE BEST EDUCATIONAL GAME of 1993

"*10 out of 10* Maths (Algebra) meets all the criteria for an outstanding educational program and fully deserves first place as the Edutainment Program of the year. Ten out of Ten for it!"
– *Amiga User International (January '94)*

"This pack is very good. It is well suited to both home and school use. It encourages good skills, like searching for patterns and estimating. Also it's available on approval, so what are you waiting for?"
– *Acorn Computing (December '93)*

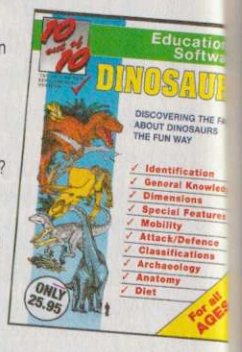
## Junior Essentials

*For children 5 to 11 years*

A truly flexible package covering many topics essential for building a good educational foundation. The areas covered have been carefully chosen by a team of experts and come from several subjects and levels of the National Curriculum.
The child's progress in these areas is constantly monitored and recorded and parents or teachers can easily discover where a child needs help. As with all the *10 out of 10* series, further motivation to play the games and learn more is added in the form of High Score Tables.

## Dinosaurs

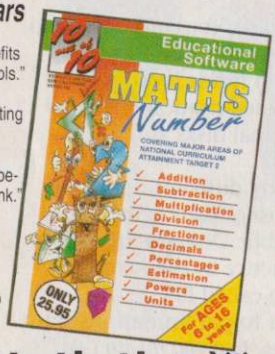
*For all ages*




This package is the fun way to learn the facts about dinosaurs. The six games all have superb digitised graphics to make a whole area of history – dinosaurs – come alive. If you came face to face with a tyrannosaurus would you run away? Or are you safe because it's a vegetarian and wouldn't eat you? This, together with 100s of other interesting facts, can be discovered from this enthralling package. The six games – all with single and multi-player options – are educational fun for everyone.

## Maths (Number)

*For children 6 to 16 years*




"Well thought out to offer real benefits to children studying in British schools."
– *PC Plus (July '93)*

"Educationally worthwhile and exciting to play – a rare combination."
– *Archimedes World (December '92).*

"Unique in home-based programs because of the National Curriculum link."
– *The Micro User (September '92)*

"Excellent for reinforcing specific mathematics knowledge."
– *Junior Education (July '93)*

"The *10 out of 10* Series lives up to its name." – *PC Home (August '93)*

## Early Essentials

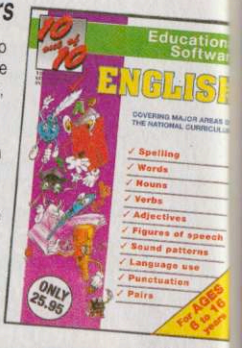
*For children under 7 years*

"Outstanding. All of the activities are not only very enjoyable but they're well thought through. It's one of the best multi-purpose infant packages I've seen in a long while. If you have young kids get it for the home. If you're a teacher, hammer on the headteacher's door and beg for money to buy a copy."
– *Archimedes World (July '93)*

"At just £25.95 you'll be hard pressed to find anything which even comes close to Early Essentials."
– *Micro Computer Mart (Sept. '93)*

## English

*For children 6 to 16 years*




"Everything being done is relevant to the player's education. An invaluable curriculum experience, plenty of fun, lots of variety."
– *PC Home (November '93)*

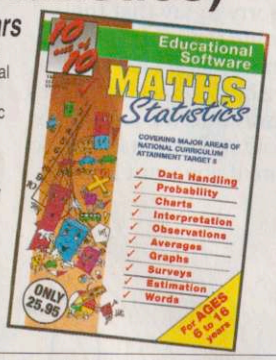
"Guaranteed to sustain the attention of even reluctant learners."
– *RISC User (January/February '93)*

"Most importantly, as the games are fun, children can't help but learn."
– *Acorn Computing (March '93)*

"Allows progression from Junior school age right up to GCSE level ."
– *Amiga User International (Sept. '93)*

## Maths (Statistics)¤

*For children 6 to 16 years*




Attainment Target 5 of the National Curriculum is Data Handling – a vital area of Mathematics. *10 out of 10* Maths (Statistics) covers 36 specific topics from that subject.
In this package, recording animal sightings in an animated pond or rolling dice are just two of the many challenges that children will relish as they learn about statistics. And can graph drawing be a game? It becomes arcade action as bricks and bombs are dropped onto the charts. This is a really enjoyable way to learn about statistics.

## French¤

*For children 6 to 16 years*

This suite of six educational games will give fun and motivation to all children learning French. The package is designed with the Modern Languages National Curriculum firmly in mind and contains many challenges to reinforce facts stated in Attainment Targets 3 and 4.
*10 out of 10* French is essential for children on Key stages 3 and 4, but the numerous parent and teacher customisation options make the software suitable for all children – however young – who are learning the French language.

## Driving Test¤

*For all drivers and learners*

Whether you're a novice learner or an advanced expert, there's plenty you can learn from this package. There are thousands of built-in questions and you can choose whether you want to answer them directly or add to the fun by trying them within games.
The six games have been designed to be fun for all adults and include strategy, mental agility, coordination and more. And, if you think you are up to it, you can "*take the test*" – a challenge covering many areas of the Driving Test.

## The INNOVATIVE *10 out of 10* Series

***These highly acclaimed suites of programs are a revolutionary step forward in educational software. They ALL use a unique system of automatically recording children's progress as they play and learn. This is just one of the many features which sets the 10 out of 10 Series in a class of its own.***

Already used in over 6000 schools

Each package contains **SIX** expertly designed educational games **covering TEN essential areas** of a child's education. All packages cover a **wide age range** and subjects are available for all children from three to sixteen years of age.
As children learn from the games their progress is **automatically recorded in 36 specific challenges** – the National Curriculum Attainment Targets of these areas are optionally displayed on screen in subject-based packages. All the programs are **designed in Britain** to be **fun for single players or groups** and the assessment system can monitor the progress of up to 4000 children with **no input from parent or teache**r needed. Watch them, join in the fun or leave them and return later to check their progress. **You're in control!**

## Phone 0742 780370 for a FREE TRIAL!

**We are so confident you'll like *10 out of 10* software that we'll let you try it FREE. Ask for a free trial* and we will not bank any payment until you've had chance to test the programs yourself.**
**DEMONSTRATION VERSIONS are also available – each subject is on a separate disk. They cost £1 each. This will be refunded when you order the full version.**

## A CHANCE TO EARN MONEY

**You can EARN MONEY by recommending *10 out of 1*** – over £5 for every order you generate. Ring 0742 78037 and ask about the *10 out of 10* Agency scheme now!

## HOW TO ORDER ...

***The 10 out of 10 Series is available for Acorn 32-bit computer (Archimedes), Commodore Amiga and IBM/PC and compatibles. At the time of going to press, titles marked ¤ were not availabl on all formats. Please ring for availability. Each package is ONL £25.95 and you can order by CREDIT CARD, CHEQUE o EDUCATION AUTHORITY ORDER.***

***If you ask for a free trial* we will send you the software withou processing the payment. If you do not wish to keep the package return it to us within 14 days and we will return your ORIGINA cheque or order or not process your credit card for payment.***

**Order by Post or Phone from:**

***10 out of 10 Educational Systems***

**1 Percy Street, Sheffield, S3 8AU**

VISA ☎ **0742 780370 / 769950** Access

*Site and Network Licences are available – please ring for details.*

* The free trial may not be used in conjunction with any other offer.

The *10 out of 10* Series is available from all good computer software suppliers

# Wild colour

THE Gold 'n Eagle is a new packaging combination from Wild Vision (091-519 1455) consisting of its Eagle M2 Multi-media card and the ColourCard Gold graphics accelerator. This allows you to display true colour, full motion video of TV-like quality on the Acorn desktop for less than £500.

The company is also offering existing Acorn Replay DIY card owners an upgrade path with a rebate of £99 against the price of an Eagle M2 when they trade in an old DIY card. This offer ends 30 April.

# Degrees of success

FOLLOWING fears in the games market over the few years that innovative game development teams were not emerging, there is to be a university course in games design. This move has been supported by Sega, Ocean and Domark and sees the validation of a Bachelor's and Master's Degree in *The Design and Production of Interactive Games.*

The first course will start at Middlesex University this September with other universities expected to follow.

# Selective maths

SELECTIVE Software (0458 43079) have developed a maths pack for Key Stages 2 and 3 called Don the Professor, offering a variety of programs covering number, algebra, data handling, shape and space.

Each program has a choice of difficulty levels and presents problem-solving situations that allow children to use their skills realistically and practically. A common storyline is used throughout but each program can be used as a stand-alone activity for pupils in groups or on their own.

Links are made with the National Curriculum and with booklets within the popular SMP 11-16 scheme as well as the new Oxford Mathematics books. To cater for handling information a large database is also provided in formats suitable for most database programs.

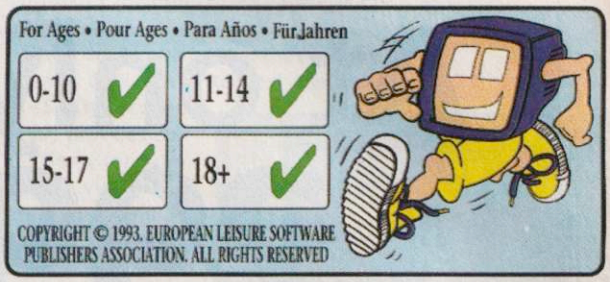
# Games for all ages

ELSPA – the European Leisure Software Producers Association – are believed to have forestalled calls for government intervention in the classification of games software by introducing their own voluntary guidelines.

Starting in May, all disk, cartridge and CD games produced by members of the association will bear a sticker indicating the age group for which they are appropriate. The scheme has been devised by the Video Standards Council and has picked out four distinct age ranges: 0-10, 11-14, 15-17 and 18+.

Publishers have received information to help them decide between awarding a tick or cross, and any game that contains any element from the 15-17 prohibited list will automatically get an 18 tick – unless it goes so far that it loses its right to exemption from the 1984 Video Recordings Act. In this instance games are submitted to the BBFC for legally enforceable classification.

Every game will show all four categories with a tick or cross indicating their suitability. Publishers decide on the grading themselves and retailers cannot refuse to sell games based on the age guidelines. After all, these are guidelines not laws, and as such each box will have a message explaining they are exempt from classification under UK legislation.




It is up to the shops and ELSPA to make people aware of the scheme, and it is here that this move will succeed or fail.

Although ELSPA have unanimously voted for the scheme, there are some dissenting voices. It is likely that the majority of games will have ticks in all the boxes and it is felt by some that the film and video classification system – U, 12, 15,18 – would have been simpler.

# Never a cross word

PANDA Disks have updated their multi-tasking crossword authoring and solving application, XWord. Following discussions with users – including two professional newspaper puzzle authors – they compiled a *wish list* of features including the option to check the spellings of words and to toggle between upper and lower case letters.

XWord now has better puzzle grids, an improved random blank puzzle facility and the ability to re-scale grids to screen and window size.

In addition, owners of Brain Games' !Tiles crossword can design puzzles in XWord 1.2 and export them into !Tiles. Development does not stop here, as plans are under way to produce puzzle disks, blank puzzle grids and dictionary utilities.

XWord costs £39.95 with demonstration disks available for £1.50 – or £2 for a high density version with bonus items. Existing owners can obtain a free upgrade if they send their master disk and return postage to Panda Disks, Four Seasons, Tinkers Lane, Brewood, ST19 9DE.

# Competition winners

WE'VE had the biggest response ever for the last couple of competitions we ran. The Revolution Competition offered you the chance to win a Morley CD-Rom drive for your 32-bit machine. The first correct entry pulled from the sack was that from Peter Padevit from London. The next five winners – Sean Lynch, Swansea; John Francis, Shetland; S.J. Taylor, Ash; M.A. Aldridge, Draycott and Mark Empson from Harpenden – will all be receiving a 12-issue subscription to *Acorn Computing.*

Acorn were offering an A3010 with Learning Curve pack and monitor, also in the Special Issue. The lucky winner was Philip Hopkins from Swansea.

Back in the December issue Sherston Software invited 10 readers to test their skills in the Crystal Dome in Blackpool. Winners of this challenge are: Rebecca Halls, Egham; Ricky Dawson, Chatteris; Nicola Gyselman, Thornton Cleveleys; J.A. Sutcliffe, Leeds; David Habbershaw, Heage; D. Sprint, Pudsey; Jenny Porter, Gwynedd; J. Davies, Batley; A,L, Harris, York; and S.C. Wing from Sydenham. We'll be reporting on how they get on in a later issue.

And the winners of the August and January Survey competition prizes of £200 were David Turnbull of Peterborough and Thomas McGowan of Sheffield respectively.

# Revolution.
# The new CD-ROM.
# At only £299 + VAT
# its pedigree may surprise you!

The Morley **Revolution** is the ultimate plug-in-and-go CD-ROM drive solution for Acorn 32bit computers.

This Revolutionary new system is the result of a unique Morley Electronics development, based around the latest CD-ROM drive from Sony. Developed specifically for the Acorn market, it is suitable for all Acorn 32bit desktop computers from the A3000 right up to the A540. There are no complicated setups or *commands. Merely plug in the interface and drive, switch on and you are ready to go. Simple and quick, the Morley **Revolution** offers an exciting solution for requirements in education, the home, industry and office environments. Current applications include encyclopaedias, dictionaries, newspapers, digitised video and sound, clip art and a host of other programs offering exciting learning possibilities that would not be feasible without CD-ROM.

The **Revolution** matches the capabilities of far more expensive drives. It is Replay, multisession and Kodak Photo CD compatible, operates via Acorn's CDFS and is compatible with existing hardware running RISC OS 3. It can also use all available RISC OS based CD-ROMs, as well as access DOS based discs and run them through emulation. It even plays audio CDs!

Contact us for more details about the Morley **Revolution** CD-ROM or place your order and join the **Revolution** now.

Sony is the registered trademark of the Sony Corporation of Japan.

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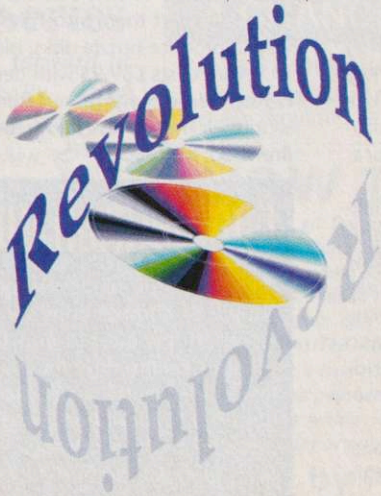
**Expanding Your Horizons**




DEPT. AC/3, MORLEY HOUSE, WEST CHIRTON, NORTH SHIELDS, TYNE & WEAR NE29 7TY TEL: 091 257 6355 FAX: 091 257 6373

# Bowled over

MAGNETIC Image, who publish the four joystick interface and the soon to be released Bowladroids, have moved. You can now contact them at: Magnetic Image, 8 Bouchier Close, Bampton, Tiverton, Devon EX16 9AG. Tel: 0398 331649.

# Guildsman

CUSTOMER confidence is not secured by instability and business failure in the computer industry as a whole. There have been several attempts to form trade associations to reassure potential customers. In the past these have been similar to the ABTA bond scheme for the travel industry,but success has been limited.

Independent Brighton-based Senlac Computing (0273 208074) have taken a more novel approach and have been admitted as a corporate member to the prestigious Guild of Master Craftsmen. The Guild is known primarily for maintaining high standards in traditional crafts. However it does represent a complete spectrum of businesses concerned with quality and high standards of customer service.

THE GUILD OF MASTER CRAFTSMEN

# Cacheing in

EESOX (0223 264242) have released an intelligent cacheing utility called CDFast. This is designed to improve the performance of CD-Roms. It can be used with any CD-Rom drive and any version of CDFS. The cost is £25.

Eesox claim that CDFast will enhance the performance of virtually all CD-Rom titles by between 30 to 45 per cent with databases and applications with a large number of files benefiting most.

CDFast can be configured to Minimal or Enhanced Memory modes. The former needs only 8k of memory for both the code and the cache, so can be used with even the most memory intensive programs. The Enhanced modes needs 36k and provides more intelligent cacheing algorithms and so improves performance.

# Advice and support

ROB Cowell, formerly head of Dudley Education Computer Centre and sales and marketing manager for SJ Research, has formed a new company, Design IT (0902 894775), to offer independent advice and support to schools. He is also involved in the development of specialist educational software and hardware.

The company are making their debut with TeleView – the first teletext expansion card designed specifically for the Archimedes – and !TeleC_Fax software which lets you select channels, hold pages or reveal hidden text.

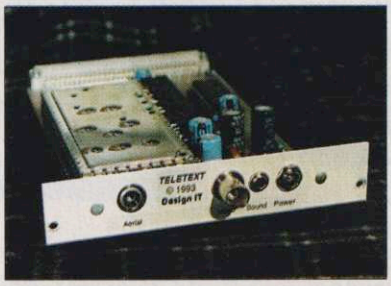
Pages can be saved as sprites, BBC Mode 7 screens or as text with graphics taken out. It is also possible to create script files to download pages automatically, and one of the options available is to set the time via teletext. !TeleC_Fax will also display pages received in foreign languages including German, French and Swedish.

There are two variants of the card. The first will only receive teletext and costs £145. The second, £159, provides connections for composite video and sound suitable for Walkman-like headphones. This allows you to listen to the TV, use a digitiser to grab live images or use the computer to record TV programmes to a video recorder that will not normally receive TV.

● *TeleView comes with its own software TeleC_Fax*

TeleView hardware is a single width card suitable for use in the A3000, A310, A400 series and A5000 with A3010, A3020, A4000 and network versions under development. The system is fully compatible with RISC OS 2 and 3. A version of the software for use with Morley Electronics adapters is also available for £25.

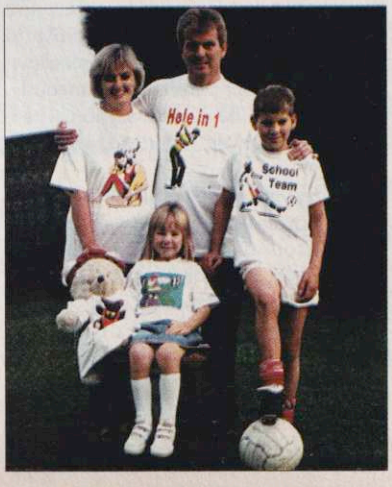
Don't forget that you need a TV licence to receive broadcast TV.




# Wear it with pride

QUILL Marketing (0603 748002) have a complete range of textile transfer papers to suit a variety of printers. Now anyone with a computer and printer – and handheld iron – can make their own T-shirts.

You can put your designs on to a variety of textiles in washproof colour making it ideal for home, school and fund raising. The papers are available in packs of 4, 30 or 100 and are available for inkjet, thermal and laser printers. Prices start at about £6.95 for a pack of four.




# Cost effective

TWO new products have been launched by David Pilling to take advantage of the cheaper hardware available for PCs. Twain is an image acquisition standard to allow easy communication between any image capturing devices – such as scanners, video digitisers and even fax machines – and software. It has been developed by a coalition of companies including Kodak, Hewlett Packard, Caere and Logitech.

It is available for PC, Apple Mac and now RISC OS platforms and in simple terms does for scanners what RISC OS printer drivers do for printers. Easy to use, applications supporting Twain can access any device with the necessary driver.

Twain can be distributed freely and anyone can write new drivers. It is currently available for the HP ScanJet, Canon IX3010 (ScanLight Pro) and Epson GT (SCSI) for £20 each.

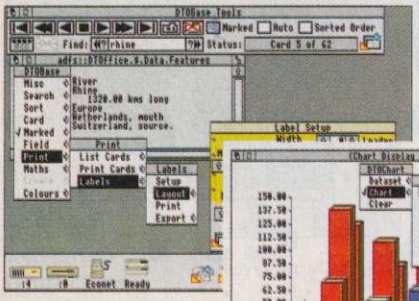
In addition there is Image Master a new £30 image processing program allowing format conversion and image acquisition from scanners via Twain. It reads and writes TIFF, JPEG, PCX, PBM, Clear, Sprite, BMP, GIF and MTV files and handles images bigger than ram using *virtual memory*.

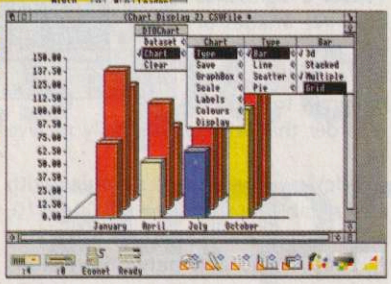
You can work with 1, 2, 4, 8, 16, 24 and 32 bits per pixel images and resample, filter, colour balance, contrast as well as use the usual editing, rotation, cropping, shearing and flipping facilities.

It supports RGB, HSV and CMYK and has Floyd Steinberg and ordered dithering. With it comes three utilities, Trace, D2Font and Snapper. As an introductory offer you can buy one Twain driver with Image Master for £35 (inc VAT). A Twain compliant version of ArcFax is available too. David Pilling, PO Box 22, Thornton Cleveleys, Blackpool FY5 1LR.

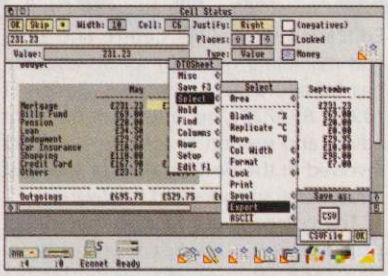
# More value for less money

SINCE the launch of the A3010 the Acorn home market has grown and with it sales of software. However, as this market has been historically small, prices have been high. Breaking this trend is Minerva (0392 437756) who have decided to pass on the benefits of a larger market to their customers.





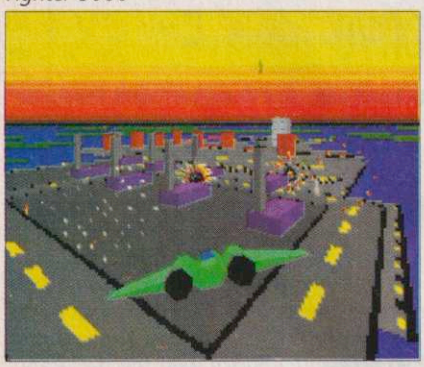
Therefore, as of now, all the best-selling Minerva home products have had their prices repositioned to reflect the growth in sales. For instance, Home Accounts is now £34.95 (inc VAT) from its previous price point of £46.94, while Ancestry, which was £82.19, becomes £59.95 and Desktop Office £69.95 from £93.94.



Furthermore, until 18 April 1994 Minerva have a sale of selected items at very special prices – with Home Accounts down further to £24.95, Desktop Office to £49.95 and Flexifile from £93.95 to £19.95 and Atelier from £99.98 to £24.95.

# A flight on the wild side

SOFTWARE developers Andrew Hutchings and Tim Parry have created their own software company, Fednet (0332 842666), and are working on a highly detailed and responsive flight simulator called Star Fighter 3000 which they plan to release at the end of the year. Their previous projects were Chocks Away and Stunt Racer 2000.



● *StuntRacer takes to the sky with Star Fighter 3000*

The scenario goes like this: The year is 3037 and the World Federation Entertainments Network is about to start its New Generation Gameshow, Star Fighter 3000.

Contestants get to travel around the galaxy in the luxury Fednet Mother Ship, stopping off at planets with no interstellar contact and taking on the planet's defences and completing certain missions. The show is then broadcast live to over 75 billion people across the universe.

The gameplay will have fast arcade shoot-'em-up action over a vast selection of missions, taking you around a number of different and varied planets. There will be the usual two-player split screen and serial link options, with the ability to run split screen over the serial link allowing for up to four players simultaneously. There will also be a Killer section where players can battle it out against each other.

During your travels you will be able to collect power-ups and destroy space stations, ground targets and countless fighters. On later missions the tasks set will be more demanding and you will even have the opportunity to destroy entire planets.

The game will run on all machines with a minimum of 2Mb, however enhanced graphics will be available for those with 4Mb or ARM3.

# Power up

FIRST there were joysticks, then Power Pads and, if Gamesware (0703 456523) have their way, there is the Power Switch, an addition to the Power Pad with which you can connect a printer and a Power Pad at the same time and simply switch between the two.

The Power Switch comes with a cable that allows you to operate it from the front of the machine. It also works with dongles and is suitable for both single and dual Power Pads. Price of the Power Switch is £17.99 (inc VAT).

# Bridging networks

DIGITAL SERVICES (0705 210600) have expanded their range of Ethernet cards with a new A5000 card, a faster version of their popular A3000 card and another designed to act as a fast bridge between networks. All cards are now available with either *Cheapernet* (10 Base 2) or *Twisted Pair* (10 Base T) connectors.

Digital claim that they are the fastest cards available for Acorn products. The A5000 card is capable of delivering in excess of 1Mbyte/sec. Prices are £139 for the A3000 and A5000 cards, and £169 for the Bridge card.

The Bridge cards can be used in place of software bridges between networks to provide significantly better levels of performance and reliability. They also enable four Ethernet cards to be used in one computer for the first time.

# User power

A NEW user group for 8-bit Acorn users has been started by Mark Brocklehurst. The first newsletter from BSG (The Beeb Supporters Group) will be sent to its Electron, BBC and Master members in March.

The bi-monthly newsletter will feature articles, reviews and letters and if you are interested in becoming a member of the group, or writing for them contact Mark at, 1 Park Avenue, Markfield, Leicester LE67 9WA.

# Finding the vrai mot

EDUCATIONAL software house 10/10 Software (0742 780370) have moved into Europe with the release of 10/10 French. This has been written by language tutors and is aligned to the National Curriculum so that teachers, parents and children can gauge progress.

The package contains six enjoyable but educational games and costs £25.95. Project Development Manager, Peter Davidson commented: "Foreign Language Tutors are by far the hardest products because historically they have always been very *text-bookian*. We believe that this pack is going to improve everybody's French because we make learning fun."

# Art Works

## Version 1.5

The latest version now includes full support for 24-bit sprites, making it the first Acorn graphics package to support full colour sprites. It is also compatible with the new graphics filter system used by Impression and includes a filter for TIFF files (the industry standard format). ArtWorks now includes the ability to print and separate these full colour images. Finally 1.5 is also a new 'fast load' version of ArtWorks - this is an advantage to all users but particularly useful for relatively slow filing systems such as CD or networks.

*"ArtWorks is quite simply the best vector drawing software on the Arch"*
*Computer Shopper*

*"It's the best ever art program to hit the Archimedes".*
*Archimedes World.*

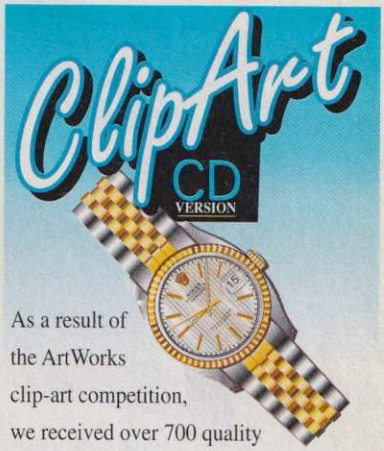
Upgrade to 1.5 from earlier versions
£10.00 + VAT (£11.75 incl.)

RRP for normal 1.5 full package
£169.00 + VAT (£198.57 incl.)
RRP for the CD version of 1.5 (includes everything on the clip-art disc)
£169.00 + VAT (£198.57 incl.)
Upgrade from the floppy disc version to CD version £29.00 + VAT (£34.07 incl.)

**To mark the release of ArtWorks version 1.5 we thought we would take the opportunity to remind you of some of ArtWorks most outstanding features:**

• Full anti-aliasing of drawings to give superb on screen quality • infinite undo, so no mistake is final • ultra fast screen re-draw • an easy to use toolbox • fast and easy to use graduated colour fills • a blend tool for tweening or morphing • an envelope tool for all sorts of distortions • a perspective tool to rotate in 3 dimensions • a text tool to enter text in any font, any angle any size - and the text remains editable on the page even after graduated fills • text around a curve • a freehand line drawing tool • the ability to break complex drawings into a number of layers • read and write file compatibility with CorelDraw, Illustrator, Freehand and various Acorn formats • ArtWorks files can be dropped straight into Impression and other major Acorn WP/DTP packages • print tiling allows poster sized prints • compatibility with all RISC OS printer drivers (including Computer Concepts 24bit colour drivers) and PostScript printers • zoom in and out • multiple window views of any drawing • interactive object dragging, scaling, rotating • a large collection of sample clip art included free • 220 high quality outline fonts included free.

*"In short, it is amazing"*
*Archive*



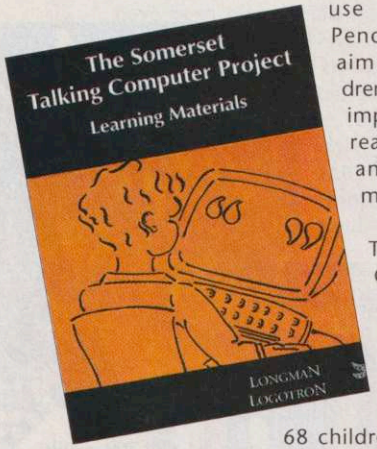

As a result of the ArtWorks clip-art competition, we received over 700 quality entries - this CD contains the best of them and many more ArtWorks examples (and the ArtWorks Viewer so that non-ArtWorks owners can view them). The illustrations can be used by anyone for incorporation into a growing range of Acorn applications that can take ArtWorks files. The disc also contains dozens of 24-bit high quality photographs (ideal for use with the 24bpp version of Impression and ArtWorks 1.5) and a demonstration version of AudioWorks with example audio files.
RRP £19.00 + VAT (£22.32 incl.)

A full 8 page specification on ArtWorks is available on request.

Computer Concepts Ltd
**Gaddesden Place**
**Hemel Hempstead, Herts HP2 6EX**
**Tel.: 0442 63933 Fax: 0442 231632**
**EMAIL: Info@CConcepts.co.uk**

# Speaking for themselves

THE Somerset Talking Computer Project Learning Materials are now available from Longman Logotron (0223 425558) for use with Talking Pendown. These aim to help children make lasting improvements in reading, writing and short-term memory.




The Somerset Talking Computer Project used traditional and talking computer methods with 68 children between 7 and 14 years with serious reading and memory difficulties. The course consisted of a little over six hours tuition of 20 minutes a day over four weeks.

The results were impressive with an average increase in reading age of 8.3 months – with the maximum progress being an increase of 37 months, that is the correct number, 37 – while the average short-term memory improvement was 16 months. There was an observed increase in concentration span self-esteem, with improvement in spelling and the transfer of skills to other curriculum areas.

Longman have released a resume of the work undertaken in Somerset, photocopiable phonic-based materials, advice on preparation and procedure as well as suggestions for monitoring progress and extending work. This pack retails for £29.00.

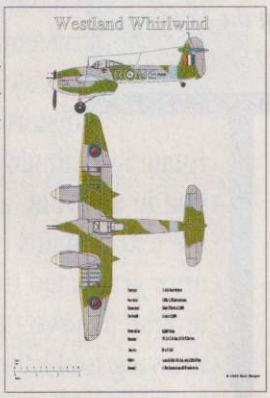
# More revolutions

MORLEY Electronics (091-257 6355) have released an upgrade to their Revolution CD-Rom drive. This new version is a double-spin, multi-session Photo-CD unit which retains its compatibility with Acorn Replay files and will also operate under the PC Emulator.

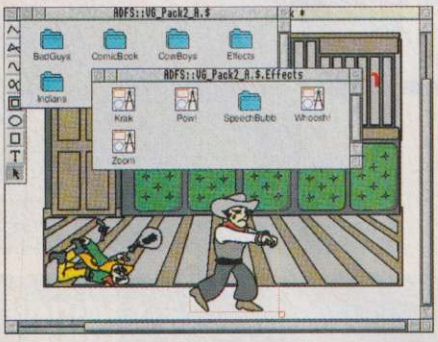
Each drive comes with the latest version of !ChangeFSI which is needed to read Kodak Photo-CDs. The new system costs £299 which includes an interface for all Acorn desktop models. A hybrid version is also available which you can connect to an Acorn or PC for £379.

# Artful collections

THE quantity and quality of DTP resources continues to increase with more fonts and clip-art appearing to enhance design. Dec_Data (0392 221702) have released four new clip art collections: Famous Buildings, Hand Tools, Military Aircraft and the Party, Wedding and Anniversary Collection. The first three retail for £7.95 with the third costing £14.



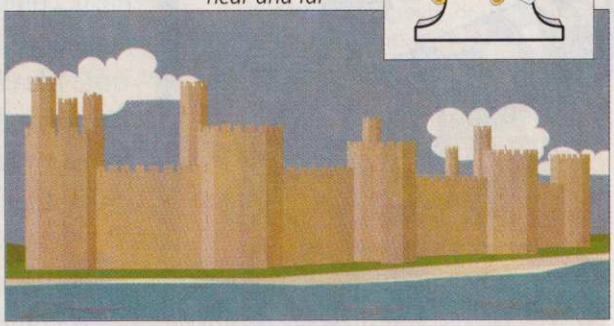

● *Details and views accompany the military aircraft*




● *Recreate the Old West courtesy of Matt Black's Vanguard clip-art*

The Famous Buildings reflect different materials and cultures with Chichen Itza from Mexico and the CN Tower in Toronto. All are in colour as are the hand tools which cover building, carpentry, decoration, mechanics and electrics as well as a range of wood joints. The aircraft in the third pack covers all types of planes from 1914 to the jet age.

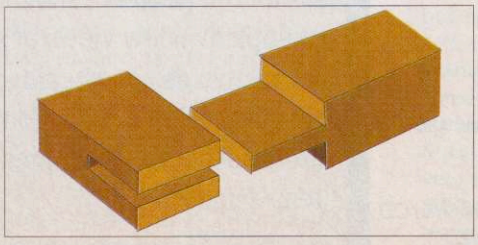
● *Create your own birthday cards and decorations*



● *Famous buildings from near and far*

The party collection comes on two disks and provides ready-made designs for cards, invitations, wedding stationary and name tags. It gives you files for Halloween, Guy Fawkes, Valentine's Day and wedding anniversaries all as compressed drawfiles – a total of 2.3Mb of hand-drawn images.

Taking a different approach are Matt Black (0733 315439) with the latest edition to the Vanguard Graphics series, Cowboys and Indians. This comic book creation kit consists of original colour drawfiles on two disks, as well as a free outline font Comic Book for adding hand drawn style lettering. There is also a 12-page booklet providing a visual image index as well as help and advice. The cost is £15.



● *Clip-art has many uses – here it shows a bridle joint*

## Diary Dates

**Spring All Micro Show, Radio Rally and Electronics Fair**
Date: Saturday, 16 April 1994
Venue: Bingley Hall, Stafford
Contact: Sharward Services (0473 272002)

**Acorn User Show**
Date: 22-24 April 1994
Venue: Harrogate
Contact: Safesel (0737 814713)

**MEMS '94 – Midi, Electronic Music and Recording Show**
Date: 22-24 April 1994
Venue: Wembley Conference Centre, London
Contact: Westminster Exhibitions (0222 512128)

**37th Longleat Amateur Radio Rally**
Date: Sunday, 26 June 1994
Venue: Longleat Park, Warminster, Wiltshire
Contact: Radio Society of Great Britain (0272 860422)

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# Two easy rea

## Bruce Goatly saves wear and tear on the keyboard

**IF you've ever bemoaned how long it takes to re-type a long piece of text that someone else has already typed, you may have longed for the day when a computer could do the job for you.**

Well, what you've been yearning for is optical character recognition – OCR. It's been around for several years on machines such as PCs but has taken a couple of years longer than originally expected to bring its force to Archimedes users.

The problem is not with computing power – the Acorn machines have more than enough – but in the sheer complexity of the exercise. Converting a human-readable image of a page into a machine-readable textual form that can be edited with a word processor takes large amounts of processing, and even intelligence, which implies a lot of programming time and skill.

Anyway, within a few months of each other two OCR applications have appeared for the Archimedes, each doing the same basic job, but going about it in different ways. How do they measure up?

### PRODUCT SPOTLIGHT

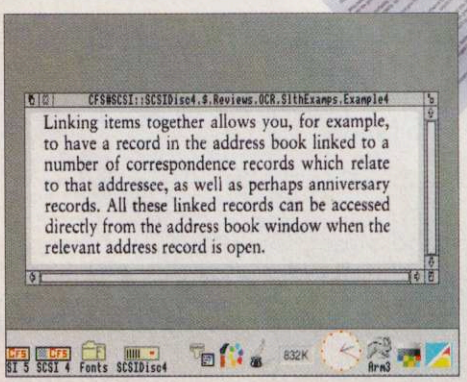
*Product: Sleuth*
*Price: £49.00*
*Supplier: RISC Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS.*
*Tel: 0727 84303*
*Requirements: Scanner (200 dpi min) and 2Mb ram*

## Sleuth

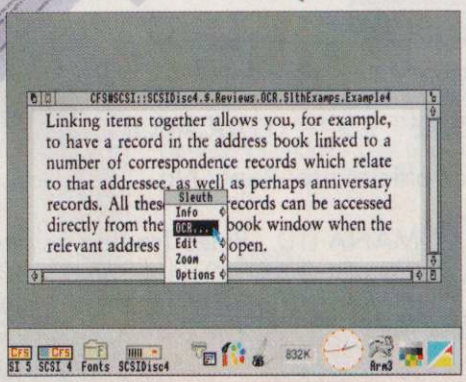
The Sleuth package contains one disk, which includes some example scans, and a short but clear manual. Because the software is pretty easy to use you might not think to look at the manual, apart from the inevitable installation instructions, but it does include four pages of useful tips and pointers which are well worth studying.

Dragging a sprite on to the iconbar icon opens a window, showing the sprite at full size. Assuming it's ready for processing, you simply choose the menu option *OCR* and another window opens in which the text appears, line by line, as it is processed.

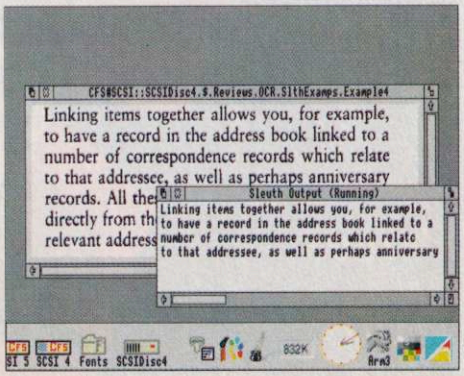
The application is multi-tasking and the text is editable in its window, so you can make manual corrections to the text on one line – either against the original or against the sprite on




● *To use Sleuth, just drop a sprite on the icon...*

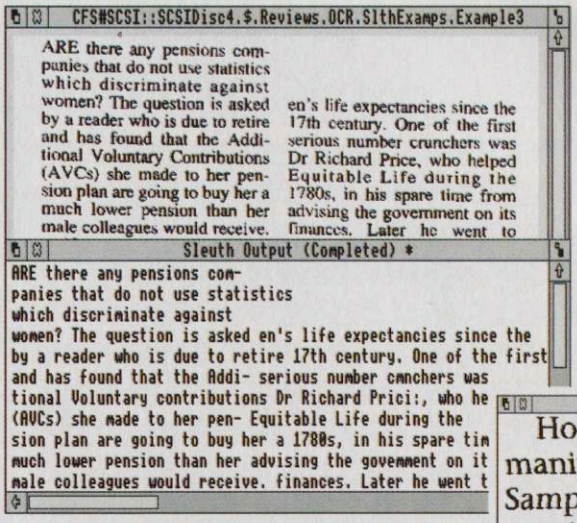



● *...select OCR...*




● *...and watch the text appear in the editable window*

# ders

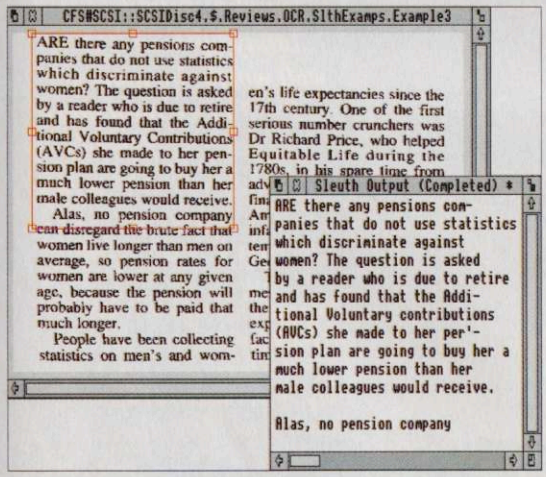



● *Sleuth coped unexpectedly well with double-column text, even without zones*

screen – while later ones are still being converted. Once the processing and editing are finished you can save the text to disk, or direct to Edit or a word processor.

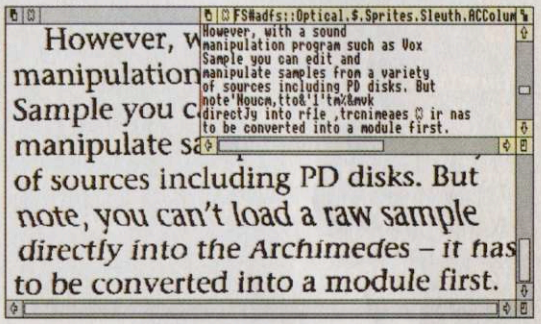
The sprite may need cleaning up before processing, perhaps because there is more than one column of text or because it also contains graphics. In that case you can create a zone, which looks just like a frame in a DTP package, to select one area at a time for processing separately.

You can also rotate the sprite by multiples of 90 degrees before conversion. This is handy if you had to scan the text sideways because the text was wider than your hand-held scanner. The sprite's colours can be inverted, too, presumably in case the original letters were in white on a black background.




● *Using Sleuth's zone facility to select a column for processing*

● *How Sleuth coped with a sample of wavy text*




A few options are provided in the way that text will appear when converted. You can define how characters that Sleuth completely fails to recognise will be represented in the finished text, and also what characters should be used for ending lines and paragraphs, though you can't specify that a paragraph should start with a tab character.

The software has been trained on a good basic set of fonts – Avant Garde, Bookman, Courier, Garamond, Helvetica, New ➤

## OCR – why and how

Who needs OCR? Well, we all lose disk files occasionally and if it was a big one you may well be relieved to be able to scan the printed copy and OCR it.

More importantly, text files on disk take up much less physical space than scans of the paper originals and can also be manipulated more easily, so the advantages to businesses of converting one to the other are significant.

How is it done? Once you think about how humans go about reading you realise it's really very complicated – we just take it for granted.

For computers to do it the software has to do several scans of the input sprite. The first is to identify horizontal darkish areas separated by white lines, which it tackles one at a time as individual lines of text.

Each line then has to be disassembled into its component parts – letters – and the shapes of each letter are then compared with a master set that has been previously learnt. How this disassembly and comparison is done varies from program to program, but the end result is a series of best guesses at what the letters are.

The sorts of errors that are made depend on how the attempt at identification is made, but the commonest are close matches where *the* changes to *tbe*, for instance and a split *e* may be misread as *i:*. Some mistakes are easier to spot than others.

Accuracy measurements in OCR should always be over 97 per cent to be of much benefit – you don't want to spend time correcting more than a few characters in every hundred, let alone worrying about those you've missed.

OCR's main limitations are that it needs a good, clear, original image, ideally scanned at 400dpi, sloping or wavy scans usually cause problems, and it won't handle complex material such as subscripts or superscripts or maths.

Accurate scanning is the key, so a hand-held scanner is probably only useful for small quantities. A flat-bed scanner is more or less essential for complete pages – and an A4 sprite at 400dpi occupies a huge amount of memory. Setting up the scanner correctly is vital – too dark and the letters fill in, too light and they break up.

# Widen your horizons

## Near laser quality A3 printing for 1/10th of the price of an A3 laser printer

### The BJ-230 and RISC OS 3 Turbo DRIVERS

**The BJ-230 is a black and white inkjet printer from Canon that handles a variety of paper sizes up to A3. It comes with a built-in 80 page sheet feeder and power supply. With a print density of 360dpi the print quality is hard to distinguish from a laser printer and better than any other competing black and white inkjet printer.**
**A sample A4 print out is available on request so you can make the comparison. And like all inkjet printers the BJ-230 is whisper quiet and both easy and cheap to maintain.**

**Price:**
**The A3 BJ-230:**
**£319 + £10 p&p + VAT (£386.57 incl.)**
**The A4 BJ-200:**
**£275 + £10 p&p + VAT (£334.87 incl.)**

**The BJ-230 is only suitable for use with RISC OS 3.1. Suitable for all models of Archimedes, but a minimum of 2 Mbytes of RAM is required.**

The BJ-230 is supplied with Computer Concepts' super-fast TurboDriver printer drivers - printing and returning control on average between three and ten times faster than the standard Acorn drivers or the Ace PROdrivers. The RISC OS 3 TurboDriver works with !Printers, which means for example that it can handle rotated text and sprite printing. If also offers full Postscript style control over screen density, screen angle and screen type to achieve the best possible print quality.

We are so confident about our combination of Canon BJ printers with TurboDrivers that we offer a no quibble, money back guarantee.

> *"This is probably the best inkjet printer yet. .. whether used on its own or with the excellent TurboDriver, the BJ-200 is a fast printer and the print quality is simply superb. A winner."*
>
> **Acorn User**

> *"The TurboDriver excels at its task of providing quick, high quality output.. ..in my opinion it is well worth the money and will more than pay for itself in terms of better productivity."*
>
> **Acorn Computing**

***The package includes the BJ-230 printer with TurboDrivers software, a cable, sample A4 sheets of high quality inkjet paper.***

Computer Concepts Ltd

*E&OE Prices & descriptions are subject to change.*

GADDESDEN PLACE HEMEL HEMPSTEAD HERTS HP2 6EX TEL.: 0442 63933 FAX. 0442 231632 EMAIL: Info@CConcepts.co.uk

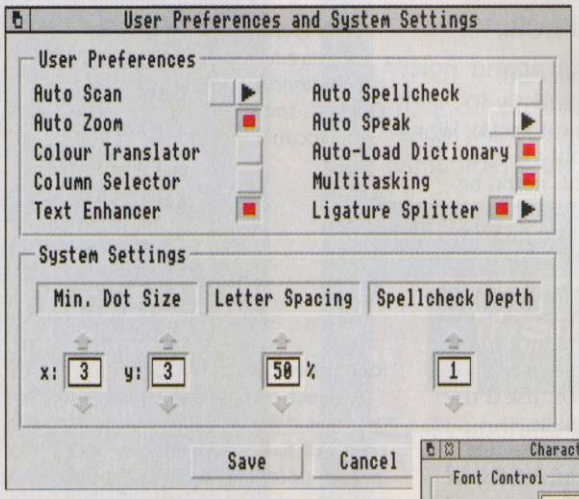
Century Schoolbook, Palatino and Times – and seemed happy enough with similar ones not in the list, as well as their Acorn-based equivalents.

However, it couldn't cope at all with italic or bold variants, nor would it convert accented characters. These are planned to follow in due course.

## Optical

Optical's software comes on two disks, one containing the application itself and the other some ready-learnt fonts and a few example sprites. The manual is a longer affair, which reflects the more ambitious nature of the software.

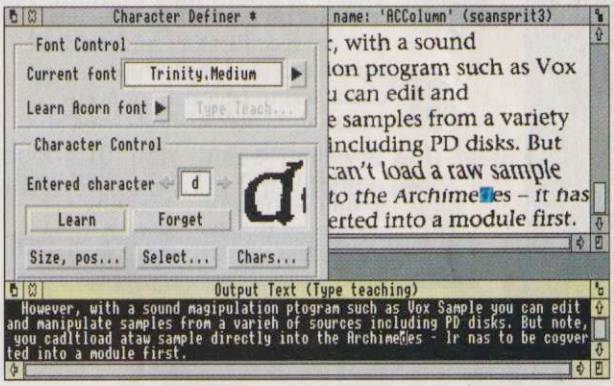
It aims to be a fully-featured OCR package with a wide range of customisable functions. Thus, dropping a sprite on to the iconbar may initiate scanning or it may bring up two views of the sprite – one the original and one for reading – depending on the option settings.




● *Customising Optical's user options*

A colour translator lets you mask off areas you don't want scanned, or alter text and background colours. You can also paste two or more scans together, which means you can use a hand-held scanner on an A4 sheet.

The reading process is optionally multi-tasking, progress being indicated by a percentage box, and the text is only displayed once the conversion is complete. Text enhancement options apply some intelligent rules to various aspects of the text during reading.



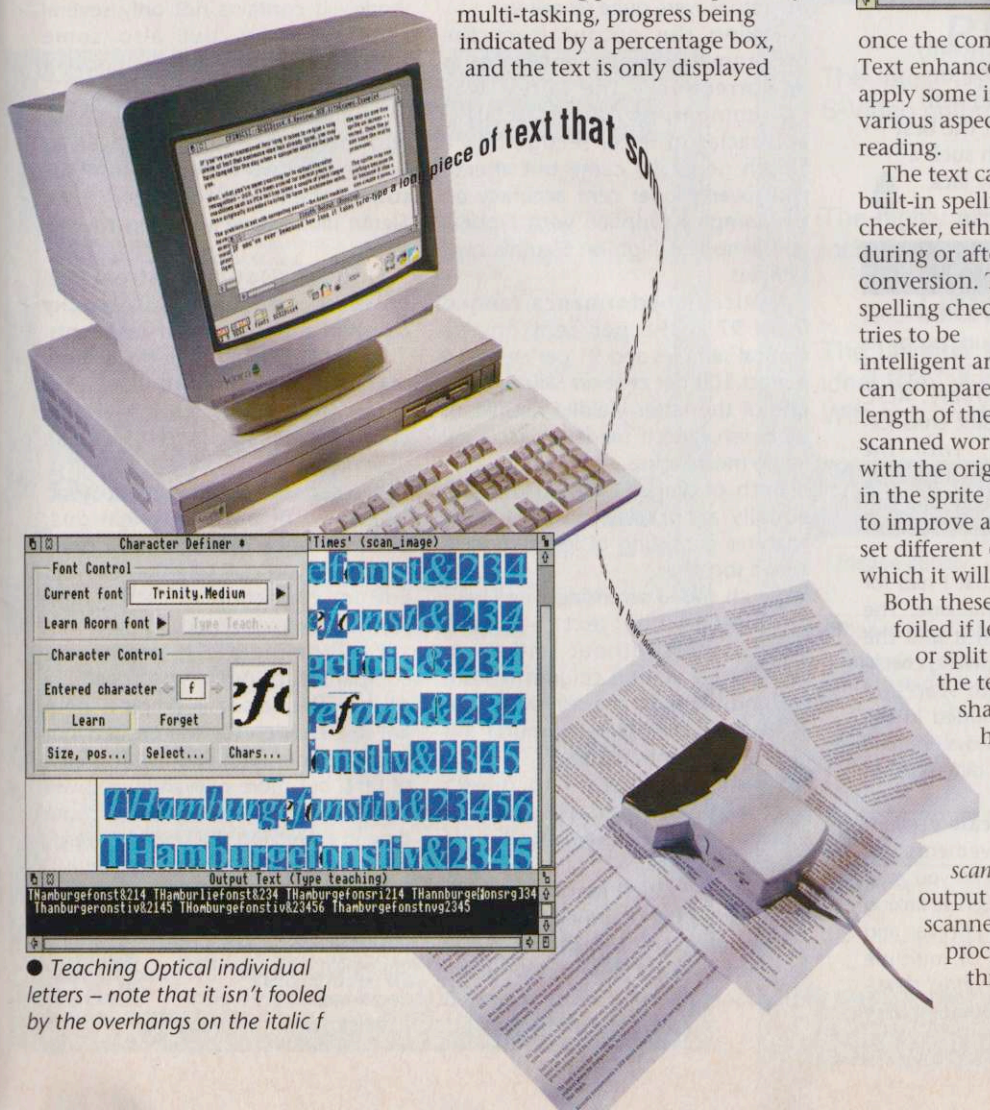

● *What Optical made of a piece of wavy text*

The reading process is optionally multi-tasking, progress being indicated by a percentage box, and the text is only displayed once the conversion is complete. Text enhancement options apply some intelligent rules to various aspects of the text during reading.

The text can be run through a built-in spelling checker, either during or after the conversion. The spelling checker tries to be intelligent and can compare the length of the scanned word with the original in the sprite to try to improve accuracy. You can also set different depths of errors to which it will make guesses.

Both these spelling strategies are foiled if letters have been joined or split during conversion, as is the teaching of outline shapes – if the software has misread an outline completely you can't assign it sensibly to a letter.

There is an *Auto scan* option to pass the output direct from your scanner to the conversion process, but I couldn't check this as the software doesn't ➤




● *Teaching Optical individual letters – note that it isn't fooled by the overhangs on the italic f*

### PRODUCT SPOTLIGHT

*Product: Optical*
*Price: £59 (Standard) £119 (Professional)*
*Supplier: Neurotron Software, Birch Tree House, The Street, Petham, Kent CT4 5QU.*
*Tel: 0227 700516*
*Requirements: Scanner (200 dpi min) and 2Mb ram*

yet recognise my scanner card.

Another option, apparently included at the request of Acorn, is to have the text read out via a speech synthesiser – this could be useful for Special Needs purposes, though whether OCR will take off in this area is debatable.

The most attractive feature of the application is its ability to learn new fonts from Acorn-format outline fonts, which widens its scope considerably. It's of most use if the program continually makes mistakes on particular characters that are specific to a font, and allows accented and other characters to be learnt, or even whole alphabets such as Greek and Cyrillic.

For accuracy you'll probably need to follow this with a teaching session on the shapes of specific scanned characters, going through a text letter by letter and correcting where necessary. The guesses improve as you go along, but complete training can take an hour or two.

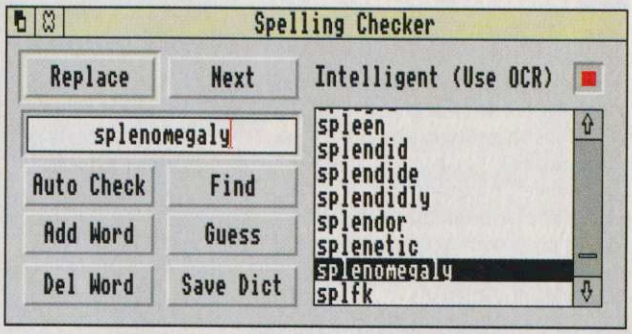
I found the manual generally hard to use – it's a bit short on explanation and could do with expansion on how to get the best out of the software. With such a wide range of options the lack of an index is unfortunate.

## Summing up

Sleuth is described as a low-cost entry point into OCR and judging by its ease of use and its effectiveness it achieves that aim admirably. RISC Developments plan significant enhancements later this year, with the intention of incorporating a spelling checker and eventually adding on a flatbed scanner to provide an all-in-one OCR package.

The version of Optical that I had for review was the Professional one. The main differences between it and the standard one are that the spelling checker, colour translator, auto scan and speech options aren't included in the basic model but you can always upgrade to the full version for the difference in price.

It was also an early release version, which meant that improvements will have been made by the time you read this, and extra features – such as linking to the Impression spelling checker and the automatic detection of multiple columns and graphics – are under development. There is a free upgrade policy for registered users of Optical.




● *From the obscure to the outlandish – Optical's spelling vocabulary*

A direct comparison of the two programs is difficult – Sleuth does an efficient but basic job, whereas Optical has greater potential but needs training to make the most of it.

If you want more than just a basic OCR package that offers scope for flexibility, try Optical. If you want something straightforward off the shelf, go for Sleuth. As both are under development by their respective teams, this isn't the end of the story by any means.

Note that decent OCR programs on other machines cost around £500, so it just isn't reasonable to expect – yet – an equivalent performance from more modestly priced applications, even on the Archimedes. But these two point the way.

## Sleuth and Optical: Head to head

To compare the two OCR applications I set them to work on the same scanned text samples, and the results were quite revealing.

Taking the output from the programs without any editing or correction – the fairest way of comparing their relative accuracies of letter recognition – Sleuth generally came out ahead, with over 99 per cent accuracy on the samples supplied with Optical and almost as high on Sleuth's own samples.

Optical's performance ranged from 97 to 98 per cent on the Optical samples and 91 per cent to a perfect 100 per cent on Sleuth's, but one of the latter yielded chunks of gibberish, which made an accuracy figure meaningless.

Both packages seemed to cope equally accurately with splitting ligatures consisting of letters *f* and *i* joined together.

Sleuth coped surprisingly well with double-column text – even (inadvisably) without setting up zones – but as the column feature was missing from the review version of Optical, I had to work round this with the colour translator.

Sleuth didn't seem to detect paragraph ends as accurately as Optical, which made intelligent guesses at them.

Sleuth also didn't remove hyphens from ends of lines, whereas Optical did this sensibly – a debatable point, but on balance I preferred Optical's approach because most line-end hyphens aren't part of the word.

Optical's spelling checker, though correctable by the user, needs some work – it contains not only several spelling errors but also some amazingly bizarre words – aobjn, foh, sysgt, szelenyi, tdza.

You also can't put words like *don't* into the dictionary, and if a word is broken into two there's no easy way to join them. On the other hand, Sleuth didn't have a spelling checker at all.

One of Optical's strengths, however, was that it successfully detected and interpreted italic fonts. This implies that it's using a more sophisticated method of identifying letters than merely making vertical cuts, because italic letters overhang their neighbours.

You can use multi-tasking to good effect with both applications, because once one scan has been processed you can save the text into Edit for correction while the next scan is being converted.

I've deliberately made no comparison of processing speeds in all this. The reason is simple – both are fast enough for the process not to get tedious for a reasonable chunk of text, but more relevantly, you will almost always have to spend more time in correcting the text afterwards than the software took to convert it.

This is the inevitable price you pay for getting a machine to do a job that calls for intelligence – humans are always best at making real decisions.

illustration from
*Explore with Flossy the Frog*

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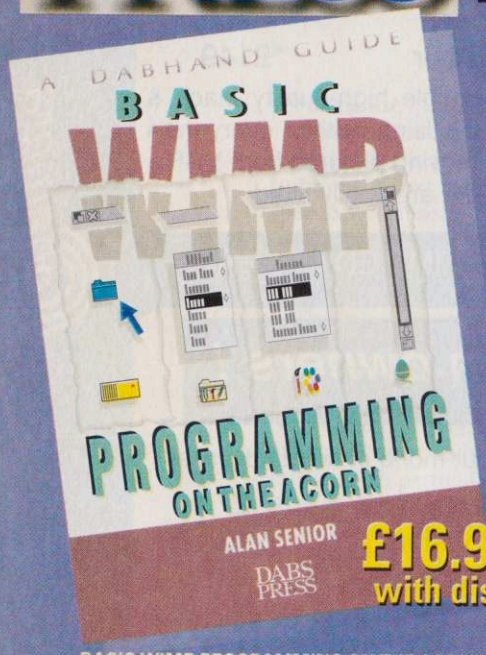


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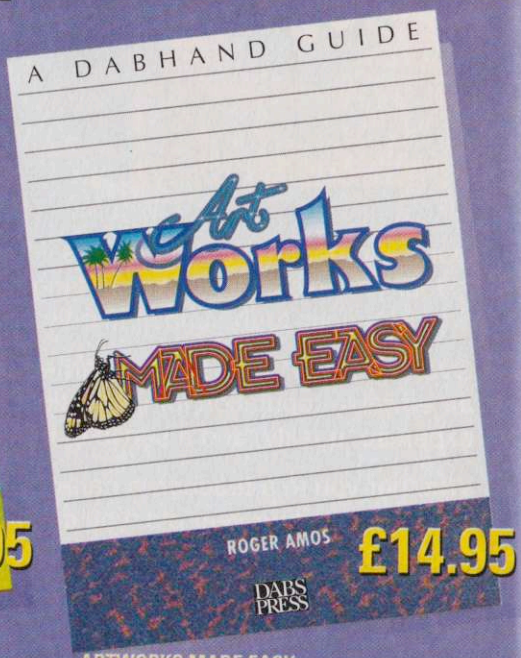
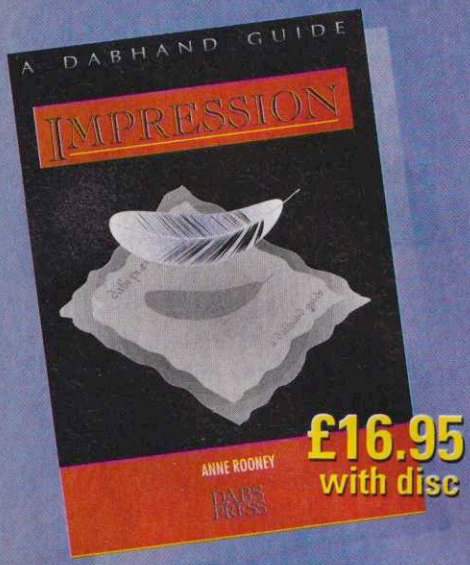



**ARTWORKS MADE EASY**

Within a few months of its launch Artworks has won widespread acceptance amongst users of Acorn 32-bit computers. The two popular DTP packages Impression and Ovation have both been modified to accept Artworks graphics. This book is intended for the newcomer to Artworks. It takes the reader step by step through the features of Artworks and draws attention to the principal differences from the Draw application supplied with RISC OS.

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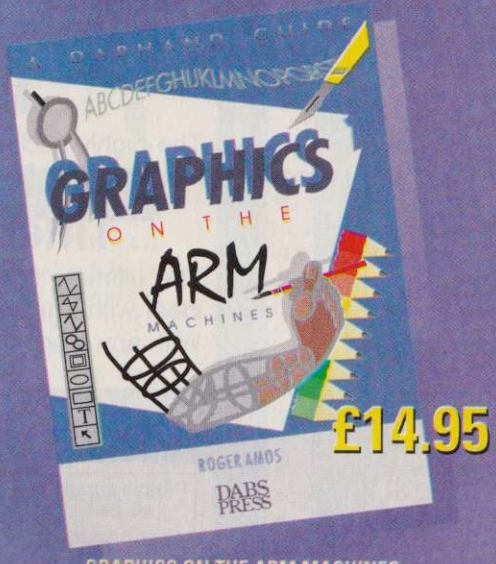


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**Other Acorn Books**

**Archimedes Assembly Language**. The only tutorial and reference on ARM assembler on the market, with many RISC OS examples. £14.95. Disc available at £7.00 inc. VAT.

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# That little bit extra

## Pam Turnbull examines some aids to improve your DTP technique

**THE main problem with desktop publishing is that everyone wants to run before they can walk. This can lead to some awful initial layouts which all the books on DTP warn us about, or you get so bogged down in the technicalities of frames, sprites and fonts that you give up in despair.**

There are some excellent books around which will take you through the basic principles regardless of your chosen DTP method:

| | |
|---|---|
| ***Acorn DTP: Advanced User Guide*** | |
| Emerald | £14.95 |
| ***Budget DTP*** | |
| Dabs Press | £12.95 |
| ***Desktop Publishing on the Archimedes*** | |
| Sigma Press | £12.95 |
| ***DTP Seeds*** | |
| 4Mation | £8.45 |
| ***First Impression*** | |
| Word Processing | £29.95 |
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| ***Good Manners in DTP*** | |
| Allenhome Press | £5.95 |
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Having got yourself grounded in the basics of what you're trying to achieve, sooner or later you'll want to add to the fonts which come as standard with your computer – regardless of whether you are producing a newsletter, a children's collection of stories or a technical manual. But adding new fonts isn't as easy as it ought to be.

If you methodically check new disks with !SysMerge to update your System modules you may wonder why updating your Fonts directory can't be as straightforward. Well if so, you're not alone. Font Directory, Easy Font and FontWay provide front-end management systems for different levels of user each making use of the fact that RISC OS 3.10 can support simultaneous use of several font directories.

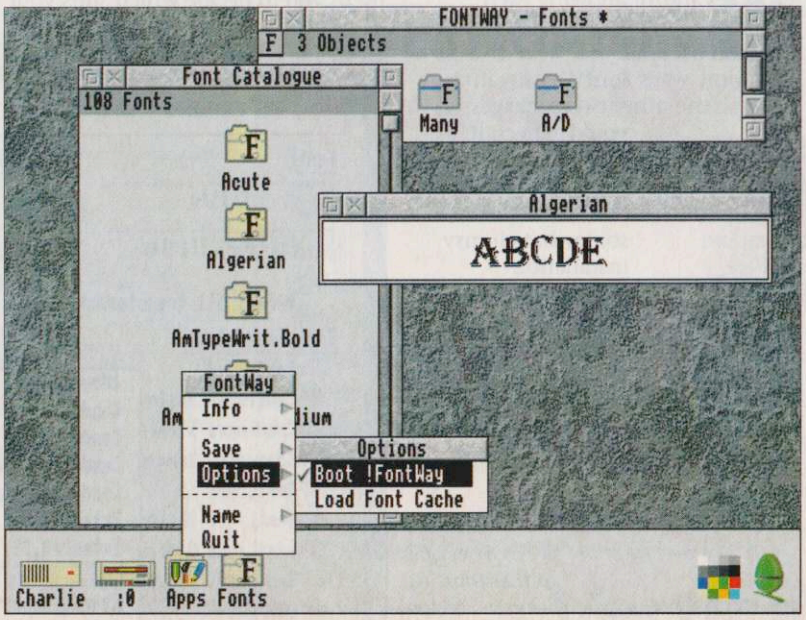
**EasyFont** sets out to tackle the storage and management problem by replacing the Fonts directory with one of its own which lives in the root directory and works best if loaded automatically via your !Boot file.

Loading and setting up is very straightforward – you just drag the font families you want on to the iconbar icon. A window appears listing the ones available with a button by each. You can choose which you want accessible by clicking the button. Click Menu over the iconbar and you'll be told how many fonts you have installed and how many are at your disposal.

This information can be saved as a text file. Clicking on the Installed fonts button saves a list of those fonts which are installed. You can then have fonts automatically installed from certain files – Impression, Artworks, Pipedream, Advance, Eureka, Ovation and Edit – dragged on to the EasyFont icon.

EasyFont also provides more information for anyone unused to fonts and what they look like – very useful indeed. The Viewer windows let you examine each font dragging them from the main or Installed window.

You can then experiment with different looks changing style, weight and size or customise these using the Transformation options all of which are then available to your ➤




● *FontWay gives control over the font cache and Boot files as well as fonts*

### PRODUCT SPOTLIGHT

*Product: Easy Font*
*Price: £25*
*Supplier: Fabis Computing, 95 Fabis Close, Swadlincote, Derbyshire DE11 9SL.*
*Tel: 0283 552761*
*Requirements: RISC OS 3.1 (hard disk drive recommended)*

*Product: Font Manager*
*Price: £35*
*Supplier: LOOKsystems, 47 Goodhale Road, Bowthorpe, Norwich NR5 9AY.*
*Tel: 0603 748253*
*Requirements: RISC OS 3.1 (hard disk drive recommended)*

*Product: FontWay*
*Price: £16 (site/network £64)*
*Supplier: XOB, Balkeerie, Eassie by Forfar, Angus DD8 1SR.*
*Tel: 0307 840364*
*Requirements: RISC OS 3.1*

other applications.

This is a very straightforward utility and one I'd recommend to anyone new to DTP or someone who doesn't plan to create documents which use wildly different styles of font. If you want, or need, to separate fonts into different directories then take a look at Font Directory.

**Font Directory** was reviewed in the December 1993 issue of *Acorn Computing*, but to recap this takes a different approach to EasyFont and one I would recommend to the more experienced user. It comes as two programs, !FontMgr – a file manager used to create and maintain partitions – and !FontDir controlling which fonts are available.

By using a partition, perhaps like the one you have for PC applications, FontMgr gives you access to a directory viewer. You install your fonts by dragging them there or more simply via the font installation menu option.

FontDir comes into its own when you want to choose which font you want access too. As with Easy Font, this information can be saved as a text file, which means that you can just have one huge font partition with different directories inside.

Last, but not least, comes **FontWay** which is the least expensive of the directory-type software. Again its aim is to give you easy access to your font resources and/or allowing each person on a network to have their selection of fonts.

In some ways FontWay fits in between the other two packages. As you'd expect, it lives in the root directory. When first loaded a somewhat clumsy installation program appears on the iconbar. Basically this lets you drag the program on to your hard disk then the iconbar icon changes to show the FontWay user application icon which you drag to a different place on your hard disk.

You can then use up to 4,000 fonts. The manual gives some ideas on how to organise your fonts into the different folders but these font directories are really sub-directories of !Fonts and don't replace it. Individual directories may contain sub-directories defining styles and it assumes that !Fonts will be seen as usual with FontWay as an addition.

As with all these programs, it is best used if incorporated in your Boot sequence. You can do this in the normal way or there is an option on the iconbar menu which will do this for you.

The FontWay icon will appear to the left of your icon bar and double-clicking will open a window. Clicking on the *F* button shows all the fonts available and active. You can change these easily from *active* to *dormant* and double-clicking will display a sample piece of text in that font.

Fonts can be moved or deleted and then only the FontWay representation of that font is deleted, not the real thing which makes a useful safeguard.

FontWay configurations can be exported if desired via the iconbar icon. A nice addition is the information of your font cache and how much is being used. You can also load a previously saved font cache.

There's also a PD utility which I find fits my needs too, Teri Paul looks at this on page 69. These programs all do their job well, it's up to you to decide which suits your needs the best.

Also worthy of a mention are two utilities from Design Concepts (031-668 2000). Font List is a £3 utility which lets you create a list of the all fonts that are available on your system. This information can then be saved to any program which accepts drawfiles.

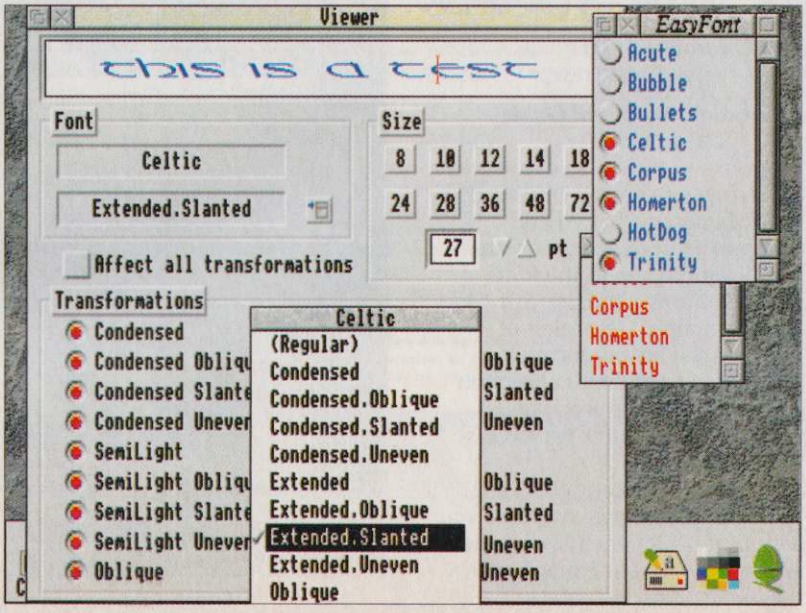
KeyCaps at £4 allows you to a preview of any font, on screen, before using it in a DTP package. A sample text string is shown helping you decide on its suitability.

## Typefaces, weights and fonts

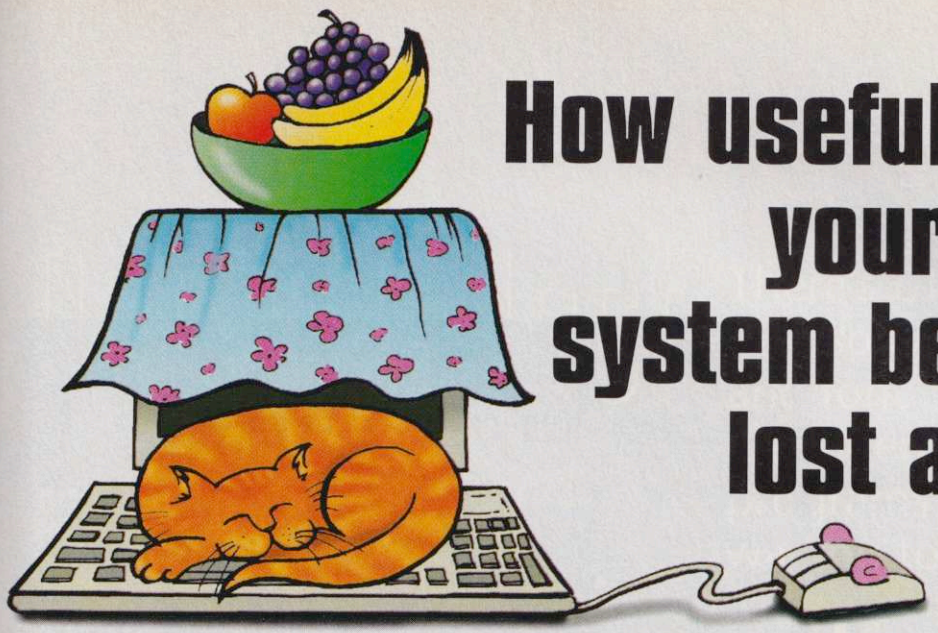
Since DTP became commonplace on desktop computers the definitions of the words associated with the subject have become a bit mixed up, so here's what the words should mean:

| | |
|---|---|
| ***Font*** | All the printing characters in a single style and weight. |
| ***Typeface*** | A name given to a font, such as *Trinity Bold*. |
| ***Font family*** | The collection of styles and weights of fonts of a particular unifying design. |
| ***Weight*** | Distinguishes different styles of thicknesses of characters. In order: Light, book, medium, demi, bold, extra, ultra – but different manufactures describe them differently |

Free catalogues are available – detailing fonts, clip-art and DTP utilities – to the first 200 Acorn Computing readers to send an SSAE to: Smart DTP, 36 Park Road, Duffield, Belper DE56 4GR.




● *EasyFont goes further than just being a directory for your fonts*



# How useful would your Acorn system be if you lost all your data?

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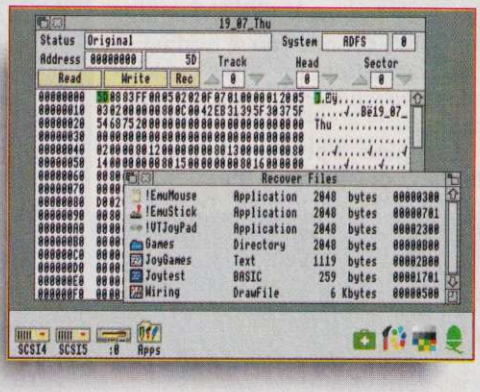


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so the best option is to get a print out before you buy.

***Style*** Distinguishes the variety of the font such as Roman or Italic.

Commonly used fonts, like Times, Helvetica and so on, have many different weights and styles, whereas it's common for display or decorative fonts to have just one, or maybe two.

Traditional print methods – hot metal – used typefaces as light, roman, bold and ultra, while added to each was the italic version. This has changed as people wanted faces halfway between weights, hence the confusion in terms.

The use of *roman* as a weight is because early fonts were based on Roman text chiselled into stone – and *serifs* (the twiddly bits on some fonts, like the one you're reading now) come from the chisel marks produced when engraving text on to stone.

Computer typesetting has added to the confusion with the addition of *oblique* as well as *italic*. To make letters oblique the letters are literally pushed over. This is sometimes confused with *italic* but it isn't. Italic makes some characters change their entire look:

f roman

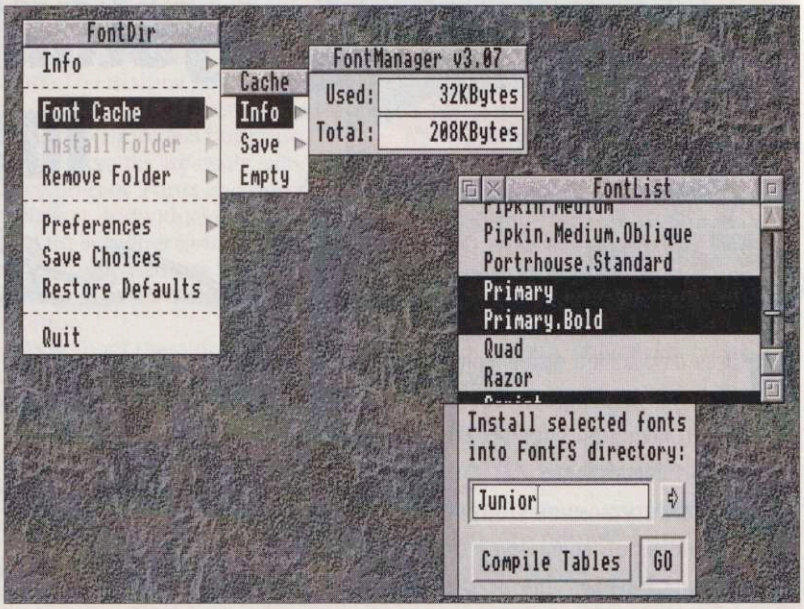
*f italic – notice that the shape is quite different*

*f oblique – just roman pushed over*

Computerisation has also meant a change in sizing of fonts. Hot metal character castings had an extra piece of lead on each casting called a *beard*. This was used for spacing/leading with more pieces of metal added to give the correct space between lines. However, computers have no physical beard.

This means that the computerised 10 point is slightly bigger than cast 10 point because the beard is effectively included, this difference can be as much as a half or one point.

Also font manufacturers size character widths differently, which is why people traditionally stayed with one font manufacturer such Letraset or Monotype.




As computers have the ability to auto-lead and auto-kern – RISC OS 3 fonts have kerning data built-in, which we'll cover some other time – you don't have to worry about these aspects too much. A rule of thumb is that leading should be 1 point higher than the typeface's, sometimes distinguished as font size and line spacing. This is true for normal faces but you'll want a different look for display typefaces.

Remember, one of the biggest giveaways when spotting people new to DTP is their bad use of space and too many or too few fonts. Another is the use of a display font in body text – making it very hard to read. The golden rule is that you want people to read what you have written so you must *design* it to be as accessible as you possible.

Normally in the Acorn market, when you buy a typeface you are actually buying a font family.

However, Datafile (0934 823005) sell Letraset, ITC and URW typefaces by weight and will supply a selection of pick and mix typefaces on the same disk.

Prices start at £7 for the first weight and £5 for each additional weight. As you will have realised fonts are many and diverse and available from a variety of sources. Below are a list of a selection of what is on offer for Acorn users:

Ainslie, Beacon, Celtic, Copperplate, Katiyo, Mairo **Design Concepts (031-668 2000)**

Anwen **Wyddfa (0286 870101)**

Bengali & Punjabi **Hampshire Microtechnology Centre (0705 378266)**

BOXI, Griffin **Dec_Data (0392 221702)**

Cyrillic (Swiss/Times), Decorative (eg FancyDress, HotDog), Primary School Pack, Starter Packs, Greek, Hebrew, Bengali, Devangari, Gujarti, Punjabi, Tamil, Vietnamese, Braille, Carta, Chess, Dingbats, MathGreek, MathLogic, MathsPhysics, Symphony, Times Phonetic **Electronic Font Foundry (0344 872923)**

Ffontiau Cymraeg (Welsh Fonts) **MEU Cymru (0443 841790)**

Medieval & Gothic **Datafile (0934 823005)**

Monotype fonts **LOOKSystems (0603 764114)**

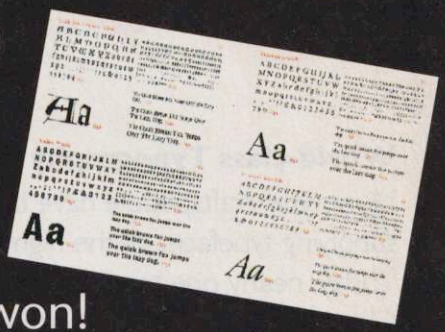
This is just a sample of the fonts available and is not intended to be a comprehensive listing.

## Very interesting

Acorn machines are very popular in Poland as it is the only *western* computer to support the Polish alphabet, thanks to the Electronic Font Foundry.

# Don't be lost for words!

There's £1,350 font software and font management programs just waiting to be won!



IF you are involved in desktop publishing – at whatever level – you'll be interested in fonts. Different typefaces change the whole feel and readability of a piece of text and can be used with very little expertise to produce a professional finished product.

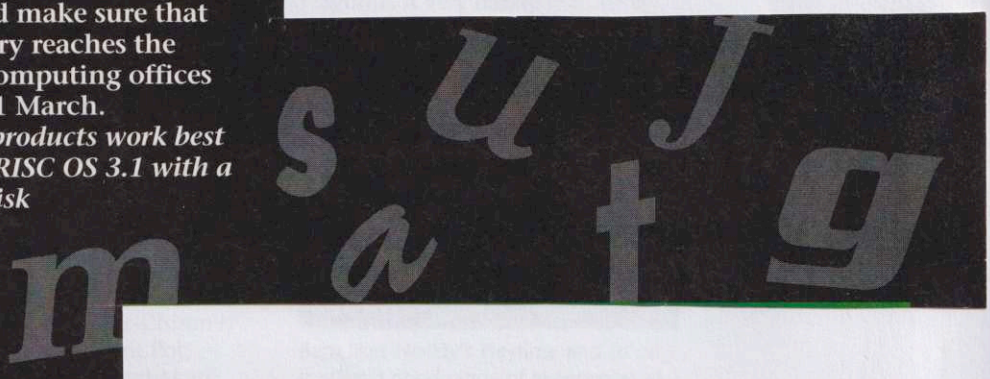
One of the first companies to produce typefaces for the old *hot metal* process was Monotype, and their fonts have been prized because of the quality and variety since 1897. LOOKsystems have licensed these fonts for use on the Acorn machines.

Now you can add 100 Monotype typefaces to your collection *PLUS* LOOKsystem's Font Directory which will let you scan documents for fonts and give flexibility, save space and give you complete control over your fonts whether on a single machine or on a network.

## What to do

To win one of these 25 prizes – worth a total of £1,350 – all you have to do is to find five DTP-related words in the wordsearch. Next complete the entry form and make sure that your entry reaches the Acorn Computing offices before 31 March.

● *These products work best under RISC OS 3.1 with a hard disk*




## 5 first prizes

- 100 Monotype typefaces (Pack 1): 100 Classic typefaces including Arial, Baskerville, Bembo, Braggadocio, Century, Dante, Garamond, Gill Sans, Goudy, Headline, Janson, Matura, Neographik, News Gothic, Onyx, Palace Script, Perpetua Titling, Plantin – with expert sets – Rockwell, Swing, 20th Century and Zeitgeist.
- Font Directory: Allows you to organise, manage and separate fonts for different purposes on the one hard disk

## 20 runners up prizes

- Font Directory

# Monotype®

## World-class Typography

Monotype craftspeople have been designing and supplying typefaces of the highest quality since 1897. Today, nearly one hundred years later, the Monotype Classic Font library is available for the Archimedes.

The library includes over 600 typefaces created by
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## RISC OS Outline Fonts

Using specially designed hinting tools, LOOKsystems have carefully converted the Monotype Classic Fonts* for use on all Acorn RISC OS computers.

Each font is created from the original Monotype outlines and intmetrics data and is completely compatible with its PostScript

## Historic Prices

What's more, these typefaces are cheaper than ever before! At less than £1 per font, you can afford to buy the very best in typeface design and rest assured in the knowledge that you own the originals.

Further details, education discounts and site licence prices are available on request.

LOOKsystems
47 Goodhale Road
Bowthorpe
Norwich
NR5 9AY.

Telephone: (0603) 764114.
Facsimile: (0603) 764011.

radenames of their respective owners.

RISC OS

# Learning in ToyTown

## An old hero in a new environment. Frank Jukes investigates

**MY youngest niece, Beth, doesn't bother with too much smalltalk. She usually says, *"Hello"*, as she comes through the front door and then it's *"Can I play on your computer, please?"*. During recent visits, though, I have started to detect a certain amount of boredom when offering My World or Revelation yet again.**

Her most recent visit was very different – I showed her Noddy's Playtime. Now in some quarters Noddy isn't quite flavour of the month, but Beth doesn't want to know anything about that. She's fallen in love with him.

The Jumping Bean Company – now that's a *real* name for a company producing software for children – have taken their courage in their hands and ignored Noddy's detractors, to produce an interesting and fun package for three to seven year olds. With eight educational programs (each with three levels) and with a painting section thrown in too, the package is exceptionally good value.

Most importantly, the programs appeal instantly to young children and can be used with the absolute minimum of help. The screens are, without exception, bright and cheerful and most of them include animations and sound effects, often unexpected or waiting to be discovered.

Where language has been used it has been carefully controlled, and on the occasions when help is needed it is progressive. You don't even need to be able to read *Yes* or *No* to confirm choices. Simply click on an animation of Noddy nodding his head or one of him shaking it.

When designing software for children it is almost too easy to develop tunnel vision and produce a restricted variety of activities. Noddy's Playtime avoids this trap.

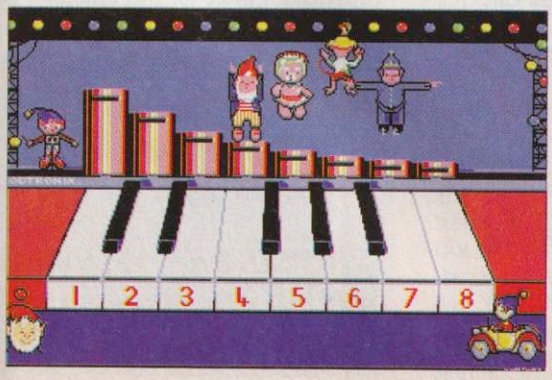
The programs provide a good cross-section of activities, from matching heads and tails of animals in the Farm Yard to dunking Mr Plod when they have correctly identified objects on the screen in the Market Place. All this introduces them to 13 initial letters and 57 words.

Other parts of the package offer opportunities to develop observational skills when spotting the odd one out in Noddy and Big Ears' Works, mathematical skills when at the Post Office and logical skills when guiding Noddy through a variety of mazes at the Police Station.

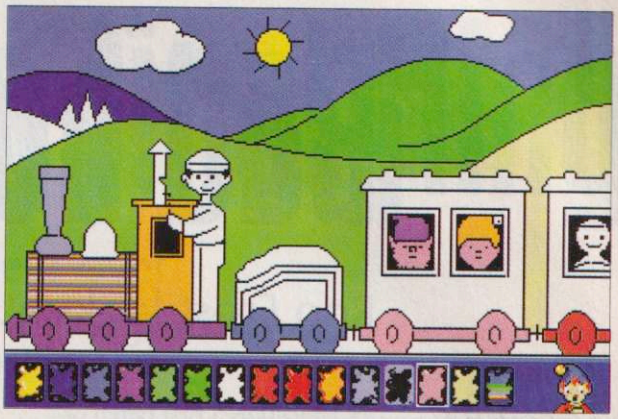
With the help of Four-Chimney House and Noddy's Paint Pot, musical and artistic activities are also included.

In Four-Chimney House, ToyTown characters come to life in the pipes of a very colourful organ, to play notes as the relevant keys are pressed. It's very simple but also great fun, with tunes being introduced at the middle and highest of the three levels and some notation also at the highest level.

Noddy's Paintpot is an excellent little art package which could well have been released on its own. It offers the usual free-hand drawing, spraying, regular shape generation and fill options, but also includes a number of characters and objects which may be pasted into a drawing.




● *Four-Chimney House ToyTown where characters come to life*



● *Paintbox is a self-contained painting package*

For those who simply like to colour in pre-drawn scenes in a variety of garish shades, there are two outline drawings at each location on the map of ToyTown just waiting for the attention of the budding artist.

The Instruction Manual is of a similar quality to the rest of Noddy's Playtime. A very handy and informative 48 page book, it offers plenty of help for teachers and parents and a short story to accompany each section of the package.

With nothing left to chance, the vocabulary introduced by each activity is listed, as are the 14 songs presented in Four-Chimney House.

### PRODUCT SPOTLIGHT

*Product: Noddy's Playtime*
*Price: £25.99*
*Supplier: The Jumping Bean Company, Leen Gate, Lenton, Nottingham, NG7 2LX.*
*Tel: 0602 792838*

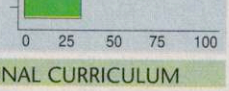
### Summing up

Beth likes Noddy's Playtime and so do I. It offers a good range of experiences at a variety of levels, it's fun and easy to use and there are useful learning experiences included throughout.

Noddy's Paintpot and Four-Chimney House are both open-ended and this should help the package grow with the child and not become stale too quickly. Recommended for both home and school.

SUITABILITY

NODDY'S PLAYTIME




NATIONAL CURRICULUM

*English ATs 2, 3 and 4.*
*Maths ATs 2, 3, 4 and 5.*
*Technology AT 5*

**Ages 3-7**

# Bad boys and girls

## Rog Frost looks at a batch of really wicked software

**SHERSTON'S first batch of Naughty Stories rapidly found favour with Key Stage one teachers. Not surprisingly, a second set of tales has quickly followed. I feel sure these won't be the last. This time, there are six books and six disks all stored neatly in a library case.**

### PRODUCT SPOTLIGHT

*Product: The Sherston Naughty Stories Volume 2*
*Price: £49.75*
*Supplier: Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire SN16 0LH.*
*Tel: 0666 840433*

The format is similar. Let's start with the paper versions. These little books have the look and feel of early reading books, except that some of the words are distinctly challenging.

Each page is A5 landscape in format and contains a brightly coloured picture and a simple sentence or two written in a clear, simple font.

Bobby is a boastful parrot who inhabits the Australian Bush. He drives all the other animals – including a kangaroo, koala and kookaburra – witless with his boastful ways. Clarence is a much loved, but clumsy, cat who causes mayhem for the family he lives with.

Derek is a little lad with a rather dopey dinosaur who has opportunities to be helpful but never manages to do anything useful. Gordon's Granny would seem to be any child's nightmare – making an embarrassing fool of herself at every opportunity.

Next comes Lucy, a little girl who lies all the time. Eventually, and inevitably, she gets her comeuppance. The final story is about a little girl called Tasmin – a typical two year old who has terrible tantrums.

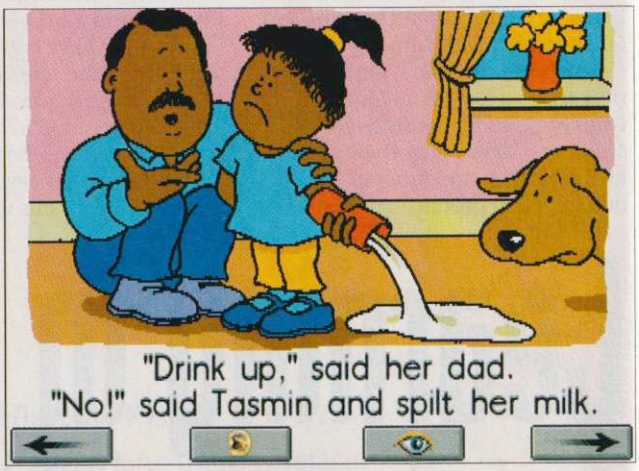
For each of the six books there is a disk including the same pictures and text. Simple controls allow the pages to be turned. But, of course, the real benefit of the software is that the words can be read to you.

Click on the ear symbol and whole pages are read in clear, high quality, sampled speech with proper inflection. Each word is highlighted too so that a young reader can follow.

Alternatively, individual words can be selected by clicking on them. In this case, the words are clearly spoken but without the intonation of words within a sentence. The teacher can set up the programs to allow just the level of speech that the young reader requires.

Clicking on the eye symbol animates the picture in some way. The eye is perhaps a slightly misleading symbol because there is an awful lot of sound in the animations. However this is not a real criticism and children love them.

● *Tasmin has terrible tantrums*




● *Teacher control. The hidden options menu*

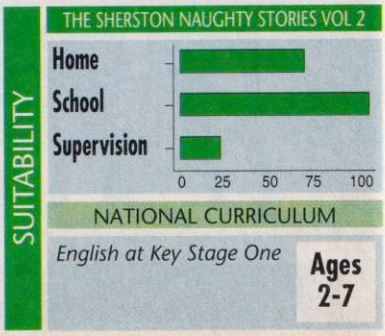
● *Simple, push button controls help youngsters steer their way through the stories.*

### Summing up

There are some technical improvements since the first volume of these tales. For those of us still soldiering on with the older ARM 2 chip, there is a single-task option. This speeds up the program considerably and also hides other options which mouse-happy youngsters might be tempted to tamper with.

A print option is also included operating with any standard RISC OS printer. The program comes with its own RISC OS font called Pipkin which hard disk users will need to copy into their !Fonts directory.

Sherston have another sure-fire winner here. Most infant teachers could find a place for this collection of stories.



# Teddy's final fling

## Rog Frost sheds a tear over Sherston's final 8-bit program

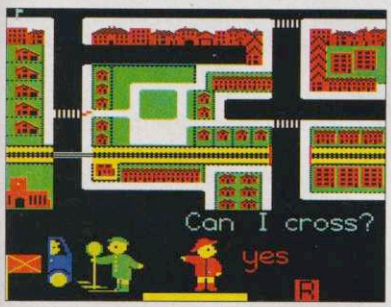
**FOR TEN years Sherston have led the field in computer education programs for primary aged children. Their success was based on the old 8-bit Model B and Master series computers and Sherston were masters at extracting the proverbial quart from the pint pot.**

The machines have long since ceased production and Sherston have announced that Teddy Bears' Rainy Day will be their last release for such computers. People brought up in the days of 32-bit splendour have a last chance to marvel at the speed and quality of programs produced on the old BBC Micro.

The package has a number of activities which centre around a day in the life of a Teddy, who is named by the user. I called him Fred, but it could just as well be a girl bear.

Teddy receives a phone call from Grandpa. We only see the end of Teddy's conversation but from this, and the subsequent conversation with Mother Bear, we gather that Teddy is going to visit Grandpa. Teddy phones back to confirm he is coming which involves searching the phone book to find the number. Alphabet knowledge is needed for this.

The next activity is the walk to the bus stop. It is, of course, raining. Having got Teddy dressed for the rain, he steps out. During his walk Teddy has to stay on the white pavements. He can cross roads on zebra crossings and he might also have to deal with a railway crossing.




● *Using a proper crossing*

Objects such as road works or fire hydrants abound on this urban walk. At each object, users are asked how Teddy might deal with them. A safety message is being drummed home here.

On arrival at the bus stop, Teddy joins the queue. The bus isn't due for a minute or two, so to while away some time questions are asked about the other bears who are waiting. These questions might be concerned with colours – all of the bears are wearing bright colours to aid visibility – or their position in the queue.

The bus arrives. Teddy gets on and has to pay his fare. This involves operating the ticket machine and sorting out the correct coins. The journey is shown as a view from the front of the bus. At various points other passengers get on and the user has to sort out fares for each of them. This might involve dealing with change.

Teddy arrives at the destination and starts walking to Grandpa's. On the way, he finds a snail and some leaves and Teddy finds he can make the snail travel from leaf to leaf. The snail leaves a trail behind.

If the user is a solo player, the computer then makes some more moves and the task is then to find the snail. This can be done logically. If there are two players – probably the best idea – one can hide the snail for the other.

Then Teddy does a little dance, driven by commands such as Forward, Right, Left, Jump or Hop. This is very early Turtle Graphics and Translations or rotations can be shown.

Our wet and muddy Teddy arrives at Grandpa's house and needs a bath. Temperature is introduced and high level users will learn about hot water systems. Teddy can add hot or cold water to his bath, and the displacement of water is shown when he sits in it. He calls Grandpa when he has finished.

They watch the weather forecast on TV and the correct weather symbols need to be selected to put on the weather map. Today's weather is described. The weather for tomorrow is guessed and the sequence ends with the bears looking out of the window at a rainbow.

### PRODUCT SPOTLIGHT

*Product: Teddy Bears' Rainy Day*
*Price: £26.95*
*Supplier: Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire SN16 0LH.*
*Tel: 0666 840433*
*Requirements: BBC B, B+ or Master*

### Summing up

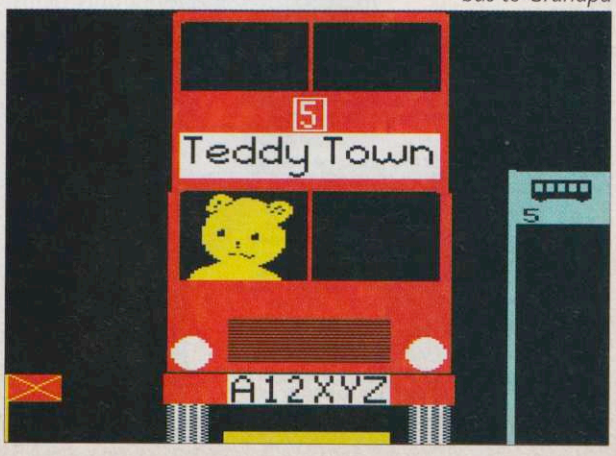
The teacher has a lot of control over the software. There are three different levels, all well described in the teachers' book. A calling system can be set up for up to eight pairs of pupils, who can play appropriate sections of the game at suitable levels. As one team finish, the next are called by the computer.

Sherston's support materials need little introduction. Apart from the guide – a wealth of educational ideas – there are worksheets and a small reading book.

Programs about Teddy Bears are clearly designed for young children, following Key Stage One of the National Curriculum. It is important that this interest level is matched to appropriate language and learning targets.

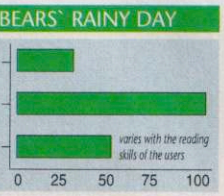
Sherston have a product here which provides simple challenges for all youngsters, but which can be adapted so that bright pupils can be stretched to their limits. A very worthwhile product.

● *Going on the bus to Grandpa*




SUITABILITY

TEDDY BEARS' RAINY DAY




NATIONAL CURRICULUM

*English, Maths, Science, Technology, Geography at Key Stage 1*

**Ages 3-7**

# Not guesswork, prediction

## Marshal Anderson examines an aid to writing and composition

**PENFRIEND is very much in the vein of the old BBC Predictype. The idea is very simple, in that the software monitors what is coming in from the keyboard and attempts to predict what is actually going to be typed. Added to this simple notion are a host of good ideas to help the slow typist.**

### PRODUCT SPOTLIGHT

*Product: PenFriend*
*Price: £27 (inc licence for up to five machines)*
*Supplier: Design Concept, 30 South Oswald Road, Edinburgh EH9 2HG.*
*Tel: 031-668 2000*

The operation of the package, for the student at least, is very straightforward. As you type into a word processor a window on the desktop shows a continually changing set of words, based on the letters that have already been typed.

If one of the words on the list is the one the typist wants, the relevant function key is pressed and the rest of the word is typed in for them. This obviously has several serious areas of application where typing might be a problem.

At the lower end of the junior school it can save on some of the *pecking* at the keyboard that children have to do to get going on a word processor.

In Special Needs, based on remediation, it can open up a fast route to success as it not only helps with typing but will also contribute to the learning of spelling.

For children with physical handicaps, specifically the kind of motor control problems that make dealing with a keyboard so difficult, it can reduce a lot of frustration and open up the written (typed) word to many children.

The configuration options are numerous and well thought out, especially in terms of the latter student group. The words can be displayed in three different sizes, the word list can follow the cursor, *clever punctuation* can add spaces and set the Shift key for a capital letter, the word window can be set to always rise to the top of all the windows on the screen and so on.

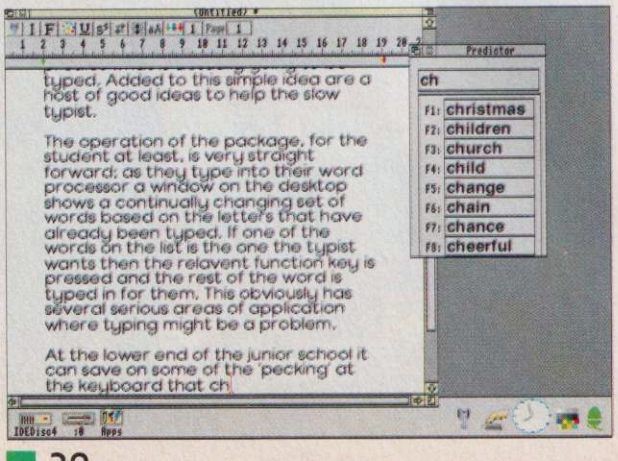
To help those with physical problems, an on-screen keyboard is available so that the mouse can be used instead of actual keys. *Sticky* keys can be set up so that if there is difficulty in pressing Shift/Control and another key together they can be used in succession.

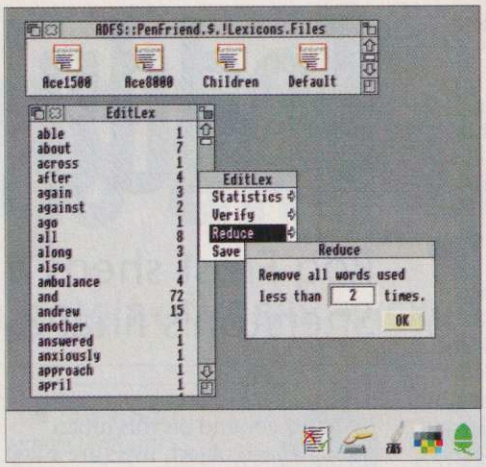
The whole thing shows care in design and attention to detail. As a bonus, the sticky keys module is in a free-standing form and can be used away from PenFriend.

The word list used, in this case called Lexicon, can be set to learn new words as they are typed, and the guessing procedure is based on the frequency with which each word is used.

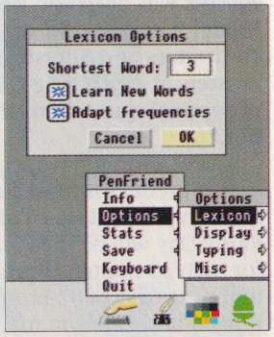
The program actually tailors itself to the user. Teachers will, however, need to monitor new words to make sure that they are spelled correctly and a utility is provided to do just this. As Lexicons can be saved under any name it is possible for each student to develop their own.

● *PenFriend in action*




● *The Lexicon can be saved...*




● *...and manipulated for individual users*

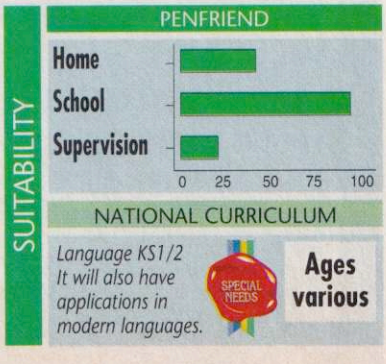
## Summing up

It has to be said that this sort of system can be a positive irritation for anyone with any typing skills at all – it can actually get in the way – so its use will have to be carefully monitored and teachers will certainly not want children to become dependent on it.

I would imagine that there is an optimum point in a child's development when this kind of package needs to be replaced with a spelling checker.

From a technical point of view, PenFriend seems to function flawlessly on the desktop. It will work alongside any keyboard input, including the RISC OS dialogue boxes and manages, quite cleverly, not to interfere with any function key presses a given word processor might require.

This is a very useful package that will find its way into many areas of education. Its current price is such that it might be worthy of consideration for use in the home if you have a child that could benefit from it.



MARCH 1994

The Archimedes Specialists

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**BEEBUG, 117 Hatfield Road, St. Albans, Herts AL1 4JS**
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## A3010

**The A3010 is the entry level 32 bit computer. Use it with TV or a monitor.**
**It includes:**
- RISC OS 3.1
- 1Mb memory
- 1.6Mb floppy drive
- Mouse
- Expandable to 4Mb

**Supplied with The Action Pack, including;**
- Zool Game
- Startwrite Word Processor
- Audio Training Tape

**Only £339**

**Options**
Memory to 2Mb £38.29 or 4Mb£159.
AKF30 Colour Monitor £180
Multi-scan monitor £195
20 Mb Hard Drive £199

**A3010 Learning Curve**
A3010 computer with 2Mb memory, colour monitor and the Learning Curve Pack.

**Only £629**

SPECIAL OFFER!
**2 Free Games Lemmings & Chuck Rock worth £35**

## A3020

**Features:**
- RISC OS 3.1
- 2Mb memory
- 1.6Mb floppy drive
- Mouse
- Expandable to 4Mb
- Colour monitor

**Only £649**

**Options**
60Mb Hard Drive £125
Multi-scan Monitor £42
AKF50 Hi Res Monitor £105
Memory to 4Mb £99

*(Not available with Learning Curve or Home Office Packs)*

SPECIAL OFFER!
**2 Free Games Lemmings & Chuck Rock worth £35**

## A4000

**The A4000 is the mid-range 32 bit computer.**
**It includes:**
- RISC OS 3.1
- 2Mb memory
- 1.6Mb floppy drive
- Colour monitor
- Mouse
- Expandable to 4Mb
- 80Mb hard drive

**Only £849**

**Options**
Multi-scan monitor £42.
AKF50 Hi Res Monitor £105.
Memory to 4Mb £99

**Alternative to Special Offer**
You may purchase The Home Office for £35

SPECIAL OFFER!
**Free Learning Curve worth £42**

## A5000

**Top of the range Acorn computer.**
**It includes:**
- RISC OS 3.1
- 2Mb memory
- Mouse
- 80Mb hard drive
- ARM 3 33Mhz processor
- Expandable to 8Mb
- 1.6Mb floppy drive
- Multi-scan colour monitor

**Only £1275**

**Options**
A5000 with 4Mb memory and 162Mb hard drive £1445.
A5000 with 4Mb memory and RISC Dev. 260Mb or 450Mb hard drive £1570 / £1790.
Memory upgrade from 4Mb to 8Mb £349.
AKF50 Hi Res Monitor £63.

**Alternative to Special Offer**
Choice of FREE Learning Curve or Home Office for £25

SPECIAL OFFER!
**Free Ovation DTP worth £99**

## A4 PORTABLE

**The A4 system is a similar specification to the A5000 but in a portable format.**
**In its base form it is supplied with 2Mb RAM and no hard drive.**

**Only £1399**

**Options**
A4 with 4Mb memory and 60Mb hard drive £1675
A4 with 4Mb RAM and RISC Dev. 120Mb or 210Mb hard drive £1807 / £1917.

SPECIAL OFFER!
**Spare A4 Battery Pack FREE Save over £50**

## SPECIAL OFFER A5000

**ONLY A FEW LEFT**
2Mb RAM, 80 MB Hard Drive, ARM 3 25 MHz processor, Learning Curve.

**Only £850 (without monitor)**

Options for monitors, RAM Upgrades and Additional Hard Drives are available at special prices.
Please phone for details.

**EDUCATION - PHONE FOR SPECIAL PRICES**



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## BOOKS/MANUALS

| | | | |
|---|---|---|---|
| 5478b | !Help | Sherston | 7.95* |
| 5479b | !Help - Draw | Sherston | 15.95* |
| 5481b | !Help 3 | Sherston | 9.95* |
| 1218b | 1st Steps Prog RISC Comp | Sigma | 14.95* |
| 1207c | 30 Hour BASIC | BBC/NEC | 15.95* |
| 1265c | A3010/3020 Tech Ref Man. | Acorn | 29.95* |
| 5856b | A4 Portable Handbook | Acorn | 7.50* |
| 5857c | A4 Technical Ref Manual | Acorn | 65.00* |
| 5855b | A4 Welcome Guide | Acorn | 10.00* |
| 1252c | A5000 Tech Ref Manual | Acorn | 65.00* |
| 1238c | Acorn Educ Directory | Acorn | 4.95* |
| 0915a | Arch Ass Lang Prog Disc | Dabs P | 7.21 |
| 1211b | Arch Assembly Language | Dabs P | 14.95* |
| 1262b | Arch Game Makers Manual | Sigma | 14.95* |
| 1243b | Arch Oper. Syst (Book) | Dabs P | 14.95* |
| 1219b | Artworks Made Easy | Dabs P | 14.95* |
| 1228b | Assembler 2 User Guide | Acorn | 25.00* |
| 0906a | Basic Wimp Prog Disc | Dabs P | 2.00* |
| 1222b | Basic Wimp Prog on Acorn | Dabs P | 14.95* |
| 1244c | BBC Basic VI Guide - Arc | Acorn | 19.95* |
| 1261b | Budget DTP on the Arch | Dabs P | 12.95* |
| 1212c | C: A Dabs Guide 3rd Ed. | Dabs P | 16.95* |
| 1247b | Control on the Arch | HCCS | 9.95* |
| 1230b | Desktop Dev Env User Gde | Acorn | 25.00* |
| 1260b | DTP on the Arch Book | Sigma | 14.95* |
| 1214b | DTP Seeds | 4Mation | 8.45* |
| BKO2b | File Handling (Book) | RISC Dev | 9.95* |
| BKO3a | File Handling Arc Disc | RISC Dev | 4.04 |
| 1249c | First Impressions-Manual | Word Proc | 29.95* |
| 1269b | Good Impression Manual | Word Proc | 26.95* |
| 1255b | Graphics on the ARM Book | Dabs P | 14.95* |
| 1237b | Impression Guide | Dabs P | 14.95* |
| 1248b | Mastering 1st Word + | Dabs P | 13.95* |
| 1206e | Prog Ref Manual RISC OS3 | Acorn | 99.00* |
| 1217c | RISC Machine Family Manl | Prentice | 32.10* |
| 1246b | RISC OS 3 First Steps | Dabs P | 14.95* |
| 1216b | Tech Pubs Style Guide | Acorn | 10.00* |
| BK13a | WIMP Prog for All Disc | RISC Dev | 4.21 |
| BK12b | WIMP Programming for All | RISC Dev | 12.95* |

## CD ROM DRIVES

| | | | |
|---|---|---|---|
| 5866g | Family Fun/Educ Pack 1 | Cumana | 412.00 |
| 5867g | Family Fun/Educ Pack 2 | Cumana | 499.00 |
| 5868g | Family Fun/Educ Pack 3 | Cumana | 593.00 |
| 5869g | Family Fun/Educ Pack 4 | Cumana | 679.00 |
| 5862g | Multimedia 16bit SCSI | Acorn | 599.00 |
| 5861g | Multimedia 8bit SCSI | Acorn | 599.00 |
| 5865g | Quad Speed CD ROM Drive | CC | 975.00 |
| 5864g | World of CD 400/540/5000 | Cumana | 637.44 |
| 5863g | World of CD A3000/3010+ | Cumana | 637.44 |

## COMPUTER UPGRADES/EXPANSION

| | | | |
|---|---|---|---|
| 0133c | A3000 1Mb RAM | RISC Dev | 49.00 |
| 0130c | A3000 1Mb RAM (Ugdable) | RISC Dev | 59.00 |
| 0131e | A3000 4Mb RAM | RISC Dev | 159.00 |
| 0228e | A3000 Podule Expander | Wild Vis | 159.85 |
| 0277b | A3000 Serial Chips | Acorn | 17.00 |
| 4610e | A3000/4000 User/Anal. | RISC Dev | 44.95 |
| 4611e | A3000/4000 User/Anlg/Ec | RISC Dev | 79.95 |
| 0144c | A3010 1Mb RAM | RISC Dev | 38.29 |
| 0146e | A3010 4Mbyte RAM | RISC Dev | 159.00 |
| 0145c | A3020/A4000/A4 2Mb RAM | RISC Dev | 105.00 |
| 0125e | A310 4Mb RAM | RISC Dev | 269.00 |
| 0768c | A310 4way B'Plane + Fan | Ifel | 52.00 |
| 5850d | A4 2Mb RAM for FD System | Acorn | 105.00 |
| 0278c | A400/1 Series 1Mb RAM | RISC Dev | 42.00 |
| 0141e | A410/1 8Mb RAM Card | RISC Dev | 419.00 |
| 0142e | A420/1 8Mb RAM Card | RISC Dev | 399.00 |
| 0143e | A440 & A440/1 8Mb RAM | RISC Dev | 369.00 |
| 0147e | A5000 2->8Mbyte RAM | RISC Dev | 399.00 |
| 0124c | A5000 2Mb RAM | RISC Dev | 99.00 |
| 0148e | A5000 4->8Mbyte RAM | RISC Dev | 349.00 |
| 4613e | A5000 User Analg & Eco | RISC Dev | 79.95 |
| 4612e | A5000 User/Anlg Port | RISC Dev | 44.95 |
| 0225g | A540 4Mb RAM | Acorn | 253.16 |
| 0134e | ARM 3 Upgrade | RISC Dev | 99.00 |
| 0775g | ColourCard Gold | Wild Vis | 225.00 |
| 0778g | ColourCard Gold - A3000 | Wild Vis | 225.00 |
| 0784c | Disc Buffer 400/1 & 540 | RISC Dev | 34.95 |
| 0135c | Disc Buffer A3000 | RISC Dev | 39.95 |
| 0795c | Disc Buffer A310/A440 | RISC Dev | 34.95 |
| 0127c | Disc Buffer A5000 | RISC Dev | 34.95 |
| 5808g | Eagle M2 | Wild Vis | 295.00 |
| 5812c | EMU Interface | Cumana | 59.00 |
| 0222g | Floating Point Accelerat | Acorn | 99.00 |
| 4630e | High Density FDC | RISC Dev | 119.00 |
| 4631e | High Density FDC + Drive | RISC Dev | 159.00 |
| 0271c | I/O Podule - Arch | Acorn | 79.95 |
| 5809g | Lark (Sound Sampler) | Wild Vis | 195.00 |
| 0236c | MEMC1A Upgrade Kit | RISC Dev | 25.00 |
| 0273c | MIDI Podule - Arch | Acorn | 69.00 |
| 0238c | MIDI/User Port A3000 | Acorn | 46.55 |
| 5880g | Multi I/O + 1.6Mb Floppy | Leading Ed | 199.00 |
| 5882g | Multi I/O 120HD IDE | Leading Ed | 320.00 |
| 5881g | Multi I/O 85HD IDE | Leading Ed | 239.00 |
| 5883c | Multi I/O Paral/Ser Port | Leading Ed | 45.00 |
| 5849c | Numeric (Maths) Co-Pro | Aleph One | 99.00 |
| 5461c | Oak-Recorder II | Solent | 39.95 |
| 5848b | PC Windows Driver S'ware | Aleph One | 25.00 |
| 5844g | PC386 1Mb Card For Arch | Aleph One | 379.00 |
| 5870g | PC386 1Mb For A3020/4000 | Acorn | 225.00 |
| 5845g | PC386 4Mb Card For Arch | Aleph One | 489.00 |
| 5846g | PC486 1Mb Card For Arch | Aleph One | 479.00 |
| 5847g | PC486 4Mb Card For Arch | Aleph One | 579.00 |
| 5871g | PC486 4Mb For A3020/4000 | Acorn | 420.00 |

## ARM 3 UPGRADE - NOW ONLY £99 + VAT

**Achieves comparable speeds to 25Mhz A5000**

- Processor upgrade for the Archimedes A310,440,400/1 series and A3000.
- Boosts performance and reduces the speed loss associated with high bandwidth screen modes.
- Speed increases are between 3 and 8 times depending on the application.

| | | | |
|---|---|---|---|
| 5874c | Printer/SCSI Interface | Atomwide | 75.00 |
| 0884b | RISC OS 3 Hardware Kit | Ifel | 21.00 |
| 0887b | RISC OS 3 Hardware Kit | Acorn | 25.53 |
| 0888d | RISC OS 3.1 | Acorn | 72.34 |
| 0885g | RISC OS 3.1 BULK (10) | Acorn | 339.58 |
| 0158e | SCSI 16bit Card For Arch | Oak | 189.95 |
| 0863e | SCSI Card (Cumana) Arch | Cumana | 189.95 |
| 0216g | SCSI Card (V 3) For Arch | Acorn | 250.00 |
| 5297b | User Port Power Supply | RISC Dev | 17.00 |
| 0139b | VIDC Mode Expander | RISC Dev | 29.95 |
| 5441e | ZY-FI Stereo Speaker Sys | Zydec | 34.74 |

## HARD DISC DRIVES

| | | | |
|---|---|---|---|
| 5285g | A3000 External IDE 260Mb | RISC Dev | 489.00 |
| 5286g | A3000 External IDE 450Mb | RISC Dev | 689.00 |
| 5272g | A3000 Internal IDE 80Mb | RISC Dev | 299.00 |
| 5273g | A3000 Internal IDE 120Mb | RISC Dev | 389.00 |
| 5275g | A3000 Internal IDE 210Mb | RISC Dev | 539.00 |
| 5242g | A3010 Internal IDE 80Mb | RISC Dev | 289.00 |
| 5243g | A3010 Internal IDE 120Mb | RISC Dev | 379.00 |
| 5245g | A3010 Internal IDE 210Mb | RISC Dev | 529.00 |
| 5232g | A3020 Internal IDE 80Mb | RISC Dev | 229.00 |
| 5233g | A3020 Internal IDE 120Mb | RISC Dev | 299.00 |
| 5235g | A3020 Internal IDE 210Mb | RISC Dev | 479.00 |
| 5851g | A4 60Mb HD Upgrade | Acorn | 350.00 |
| 5294g | A5000 260Mb 2nd Drive | RISC Dev | 319.00 |
| 5298g | A5000 450Mb 2nd Drive | RISC Dev | 519.00 |
| 5265g | Arch External IDE 260Mb | RISC Dev | 479.00 |
| 5266g | Arch External IDE 450Mb | RISC Dev | 679.00 |
| 5290g | Arch IDE 20Mb Hard Card | RISC Dev | 199.00 |
| 5292g | Arch IDE 80Mb Hard Card | RISC Dev | 299.00 |
| 5293g | Arch IDE 120Mb Hard Card | RISC Dev | 379.00 |
| 5295g | Arch IDE 210Mb Hard Card | RISC Dev | 529.00 |
| 5255g | Arch Internal IDE 260Mb | RISC Dev | 379.00 |
| 5256g | Arch Internal IDE 450Mb | RISC Dev | 579.00 |
| 5882g | Multi I/O 120HD IDE | Leading Ed | 320.00 |
| 5881g | Multi I/O 85HD IDE | Leading Ed | 239.00 |
| 5214e | SyQuest 105Mb Cartridge | RISC Dev | 69.00 |
| 5213g | SyQuest 105Mb Hard Drive | RISC Dev | 379.00 |

## MODEMS/COMMS SOFT/HARDWARE

| | | | |
|---|---|---|---|
| 5913b | Chatter | 4Mation | 33.00 |
| 0093c | Hearsay II | RISC Dev | 75.00 |
| 5593g | MicrolinFx Fax/Modem Pack | BEEBUG | 239.00 |
| 3111g | SM2400 + Hearsay II+Lead | BEEBUG | 139.00 |
| 5592g | Sportster Fax/Modem Pack | BEEBUG | 329.00 |

## MONITORS & ACCESSORIES

| | | | |
|---|---|---|---|
| 0184g | Acorn AKF17 Monitor | Acorn | 140.00 |
| 0182g | Acorn AKF30 Monitor | Acorn | 211.91 |
| 0180g | Acorn AKF40 Monitor | Acorn | 211.91 |
| 0189g | Acorn AKF50 M'scan HiRes | Acorn | 306.38 |
| 0185g | Acorn AKF52 Multiscan | Acorn | 254.47 |
| 0532g | Cub 2038 20in Monitor | Microvitec | 999.00 |
| 0525g | Cub-Scan 1440 Monitor | Microvitec | 399.00 |
| 0503g | Phillips Green Monitor | Phillips | 87.00 |
| 0501g | Ranger 5017 Monitor | Aydin | 853.00 |
| 0502g | Ranger 5021 Monitor | Aydin | 1380.00 |
| 0545d | Screen Filter 14" C.Fibre | BEEBUG | 24.64 |
| 0546e | Screen Filter 14" Glass | Memorex | 78.60 |

## Upgrade to an AKF50

Trade in your Monitor for the new AKF50.

**AKF18 to AKF50 £221.28 (£260 inc VAT)**

**Standard Arch Colour to AKF50 £ 263.83 (£310 inc VAT)**

## NETWORKS

| | | | |
|---|---|---|---|
| 5076b | !APPFS | Angelsoft | 130.00 |
| 4601e | A3000/3010 Ethernet Card | RISC Dev | 139.00 |
| 5025b | A3020/4000 Econet Module | Acorn | 49.00 |
| 4602e | A3020/4000 Ethernet Card | RISC Dev | 139.00 |
| 5853c | A4 Econet Upgrade | Acorn | 50.00 |
| 4600e | Arch/A5000 Ethernet Card | RISC Dev | 139.00 |
| 5005c | AUN Level IV Fileserver | Acorn | 394.00 |
| 5006c | AUN Level IV SL Upgrade | Acorn | 199.00 |
| 5075b | Classprint LD | Oak | 75.00 |
| 5017b | Econet Upgrade M128/Arch | Acorn | 47.95 |
| 5037e | Ethernet A3020/A4000 Int | Acorn | 149.00 |
| 5038e | Ethernet Card for A4 | Atomwide | 199.00 |
| 1209 | Networking leaflet | BEEBUG | 0.00* |
| 5008c | TCP/IP Programmers Pack | Acorn | 50.00* |
| 5007d | TCP/IP Rel 2 Single User | Acorn | 99.00 |
| 5009c | TCP/IP Release 2 | Acorn | 394.00 |

## POCKETBOOK ACCESS/SOFTWARE

| | | | |
|---|---|---|---|
| 0390e | Pocket Book Computer | Acorn | 169.95 |
| 0581b | A-Link | Acorn | 42.51 |
| 0584b | Flash Disc 256K | Acorn | 59.53 |
| 0588c | Flash Disc 512K | Acorn | 85.06 |
| 0587b | Mains Lead | Acorn | 12.72 |
| 0586b | OPL Editor | Acorn | 59.53 |
| 0582b | Parallel Link | Acorn | 25.49 |
| 0591b | Desk Stand | Widget | 14.00 |
| 0589b | Finance Pack | Widget | 42.00 |
| 0590b | Games Pack 3 | Widget | 29.00 |
| 0583b | RAM Disc 128K | Acorn | 51.02 |
| 0596b | Schedule | Acorn | 16.98 |
| 0597g | Schedule Class Pack | Acorn | 170.17 |

## PRINTERS

| | | | |
|---|---|---|---|
| 0333g | Acorn Inkjet Printer | Acorn | 229.00 |
| 0364g | Canon BJ10sx - Black | Canon | 179.00 |
| 0365g | Canon BJ10sx - White | Canon | 179.00 |
| 0451g | Canon BJ20 - Cream | Canon | 265.00 |
| 0347g | Canon BJ200 Printer | Canon | 249.00 |
| 0346g | Canon BJ230 Printer | Canon | 315.00 |
| 7510g | Canon BJ300 Printer | Canon | 329.00 |
| 7511g | Canon BJ330 Printer | Canon | 415.00 |
| 0320g | Canon BJC600 Col Printer | Canon | 455.00 |
| 7525g | Canon BJC800 Col Printer | Canon | 1370.00 |
| 0328g | Epson FX850 Printer | Epson | 323.75 |
| 0388g | Epson LQ100 Printer | Epson | 176.40 |
| 0329g | Epson LQ450 Printer | Epson | 199.00 |
| 0374g | Epson LQ570 Printer | Epson | 240.00 |
| 0382g | Epson LQ870 Printer | Epson | 424.80 |
| 0377g | Epson LX100 Printer | Epson | 155.00 |
| 0378g | Epson LX400 Printer | Epson | 136.13 |
| 0322g | Epson LX850+ Printer | Epson | 172.50 |
| 0396g | Epson Stylus 1000 Printer | Epson | 399.00 |
| 0385g | Epson Stylus 300 Printer | Epson | 215.00 |
| 0381g | Epson Stylus 800 Printer | Epson | 239.00 |
| 0495g | HP310 Deskjet Printer | HP | 199.00 |
| 0452g | HP510 Deskjet Printer | HP | 235.00 |
| 0494g | HP550C Colour Deskjet | HP | 449.00 |
| 0496g | LaserDirect HiRes4 | CC | 779.00 |
| 7500g | LaserDirect HiRes8 | CC | 1075.00 |
| 7575g | Star Laser LS-5EX | Star | 649.00 |
| 0441g | Star LC-100 Colour | Star | 134.00 |
| 0343g | Star LC-15 Printer | Star | 193.00 |
| 0436g | Star LC-200 Colour | Star | 160.00 |
| 0444g | Star LC24-100 Printer | Star | 159.00 |
| 0338g | Star LC24-15 II Printer | Star | 249.00 |
| 0367g | Star LC24-20 II Printer | Star | 176.00 |
| 0339g | Star LC24-30 Colour Printer | Star | 199.00 |
| 0340g | Star LC24-300 Colour Printer | Star | 254.00 |
| 0300g | Star SJ144 Colour Printer | Star | 395.00 |
| 0442g | Star SJ48 Inkjet Printer | Star | 189.00 |
| 0472g | Star XB24-200 Colour | Star | 341.00 |
| 0473g | Star XB24-250 Colour | Star | 407.00 |
| 0477g | Star ZA-200 Printer | Star | 269.50 |
| 0478g | Star ZA-250 Printer | Star | 341.00 |

## SCANNERS

| | | | |
|---|---|---|---|
| 1962g | ScanLight 256 - Arch | CC | 185.00 |
| 1960g | ScanLight 256 A3000/4000 | CC | 185.00 |
| 5506g | ScanLight II A4 A3000 | CC | 277.00 |
| 1963g | ScanLight II A4 Arch | CC | 277.00 |
| 1970g | Scanlight Pro+SCSI A5000 | CC | 699.00 |
| 1964g | ScanLight Pro.(No SCSI) | CC | 550.00 |
| 1954g | Scanlight Video - A3000 | CC | 215.00 |
| 1958g | ScanLight Video - A5000 | CC | 215.00 |
| 0117g | Spectra (A3000 External) | RISC Dev | 559.00 |
| 0119g | Spectra (A3000 Internal) | RISC Dev | 549.00 |
| 0118g | Spectra Archimedes/A5000 | RISC Dev | 549.00 |

## VIDEO DIGITISERS/GENLOCK

| | | | |
|---|---|---|---|
| 5843g | Chroma Genlock CG1-A3000 | Wild Vis | 215.00 |
| 5590e | Digitiser Colour - A5000 | Vision | 95.00 |
| 5591e | Digitiser Colour-A3000 | Vision | 95.00 |
| 5815g | Genlock CG3 A3000/4000 | Wild Vis | 242.00 |
| 5816g | Genlock CG4 A300/400/500 | Wild Vis | 242.00 |
| 5817g | Genlock CG5 A5000 | Wild Vis | 242.00 |
| 5594g | Greyhawk | Wild Vis | 97.00 |
| 0877g | Hawk V9 MkII -Arch/A5000 | Wild Vis | 199.00 |
| 1954g | Scanlight Video - A3000 | CC | 215.00 |
| 1958g | ScanLight Video - A5000 | CC | 215.00 |
| 5589e | VIDI Digitiser Col-A3000 | Rombo | 72.00 |
| 5588e | VIDI Digitiser Col-Arch | Rombo | 72.00 |

## SOFTWARE

### ACCOUNTING

| | | | |
|---|---|---|---|
| 5458c | Business Accounts | Minerva | 275.00 |
| 1915c | Financial Accountant | Silicon V | 227.17 |
| 0947b | Home Accounts | Minerva | 33.00 |
| 0926c | Nominal Ledger | Minerva | 79.95 |
| 5470c | Payroll Manager | Silicon Vi | 66.00 |
| 0922c | Personal Accounts | Apricote | 29.00 |
| 0920c | Prophet | Apricote | 131.00 |
| 0923b | Prophet Entry Level | Apricote | 8.00 |
| 0925c | Purchase Ledger | Minerva | 25.00 |
| 1917c | Share Holder | Silicon V | 102.13 |

### COMPUTER AIDED DESIGN

| | | | |
|---|---|---|---|
| 1909c | Arc PCB Professional | Silicon V | 234.00 |
| 0913c | Arc-PCB | Silicon V | 99.00 |
| 1931c | CADet | Minerva | 127.00 |
| 1932b | KiddiCAD | Oak | 58.00 |
| 0958c | Oak PCB | Oak | 93.00 |
| 1945g | ProCAD | Minerva | 393.00 |
| 1910c | SolidCad | Silicon V | 78.00 |
| 1911c | SolidTools | Silicon V | 225.53 |
| 1936b | WorraCAD | Oak | 93.00 |

## DESKTOP PUBLISHING

| | | | |
|---|---|---|---|
| 1113c | Impression II DTP | CC | 115.00 |
| 1111c | Impression Publisher | CC | 135.00 |
| 1112c | Impression Style | CC | 97.00 |
| 0114 | Ovation Demo Disc | RISC Dev | 4.25 |
| 0108c | Ovation DTP | RISC Dev | 99.00 |

## DTP TOOLS/UTILITIES

| | | | |
|---|---|---|---|
| 5500c | 100 Monotype Fonts | Look | 79.00 |
| 0096b | Desktop Thesaurus | RISC Dev | 19.00 |
| 5440b | Equasor | CC | 36.00 |
| 1249c | First Impressions-Manual | Word Proc | 29.95* |
| 1976a | Font FX | Datastore | 9.00 |
| 1921b | Font Pack Newhall | Acorn | 34.00 |
| 1920b | Font Starter Pack | Acorn | 34.00 |
| 5783b | Glimpse | Sherston | 8.00 |
| 1269b | Good Impression Manual | Word Proc | 26.95* |
| 5731b | Image Outliner | Iota | 72.00 |
| 5464b | Impression Business Supp | CC | 38.00 |
| 1237b | Impression Guide | Dabs P | 14.95* |
| 5526c | ShowPage | CC | 139.00 |
| 0099b | Sleuth OCR | RISC Dev | 49.00 |
| 5510b | Tracer | Midnight G | 46.00 |
| 0092b | TypeStudio | RISC Dev | 45.00 |
| 5945b | WordWorks | CC | 37.00 |

## DATABASES

| | | | |
|---|---|---|---|
| 5450b | Archivist Pro | Oregan | 34.00 |
| 5744c | Datapower | Iota | 124.00 |
| 1913c | DataVision | Silicon V | 77.00 |
| 5760b | Desktop Database | Iota | 52.00 |
| 1992c | Flexifile | Minerva | 68.00 |
| 5720b | Junior Database | Iota | 52.00 |
| 0917c | Knowledge Organiser II | Clares | 75.00 |
| 0098b | Masterfile 3 | RISC Dev | 49.00 |
| 0989c | Multistore II | Minerva | 123.00 |
| 1007c | Pinpoint | Longman | 69.00 |
| 1011b | Pinpoint Junior | Longman | 27.00 |
| 5496c | Recordz | Colton | 0.00 |
| 0931g | S-Base 2 Developer | Longman | 186.00 |
| 0932g | S-Base 2 Developer Plus | Longman | 369.00 |
| 0933c | S-Base 2 Personal | Longman | 92.00 |
| 5447c | Squirrel 2 | Digital | 129.00 |
| 5449c | Squirrel C Dev Toolkit | Digital | 97.00 |
| 0921c | System Del Plus V2 | Minerva | 39.99 |
| 5717b | Viewpoints Database | Sherston | 35.00 |

## EDUCATIONAL SOFTWARE

| | | | |
|---|---|---|---|
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| 5951b | 10/10 Junior Essentials | 10 out of 10 | 21.00 |
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| 5927b | Adventure Playground | Storm | 17.00 |
| 5700b | Animated Alphabet | Sherston | 19.00 |
| 5781b | ArcVenture 1- The Romans | Sherston | 28.00 |
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| 5788b | ArcVenture III- Vikings | Sherston | 28.00 |
| 5789b | Badger Trails | Sherston | 36.50 |
| 5933b | Balloons & The Zoo | Topologika | 27.00 |
| 5928b | Best Four Adventure | ESM | 39.60 |
| 5925b | Best Four Maths | ESM | 39.60 |
| 5488c | CableNews | Lingenuity | 136.00 |
| 1358b | Concept Designer S/Ware | Longman | 22.00 |
| 5766b | Connections | Sherston | 27.00 |
| 5737b | Control Logo | Longman | 25.00 |
| 1355e | Count with Blob - C Kbd | Widget | 20.00 |
| 5763b | Crystal Rain Forest | Sherston | 34.50 |
| 5916b | Darryl The Dragon | 4Mation | 19.50 |
| 1008b | Desk Top Stories | Resource | 35.00 |
| 5701c | Desktop Folio | ESM | 57.00 |
| 0935b | Dread Dragon Droom | Resource | 29.95 |
| 0902b | First Logo | Longman | 21.00 |
| 5918b | Flossy The Frog | 4Mation | 24.50 |
| 5702b | Freddy Teddy | Topologika | 18.00 |
| 5703b | Freddy's Adventure | Topologika | 18.00 |
| 1195b | Fun School 2 (8+) | Europress | 16.98 |
| 5704b | Fun School 3 (-5) | Europress | 17.00 |
| 5705b | Fun School 3 (5-7) | Europress | 17.00 |
| 5706b | Fun School 3 (7+) | Europress | 17.00 |
| 5791b | Fun School 4 (-5) | Europress | 17.00 |
| 5792b | Fun School 4 (5-7) | Europress | 17.00 |
| 5793b | Fun School 4 (7+) | Europress | 17.00 |
| 5491b | Genesis II | Oak | 99.00 |
| 5761b | Graph_IT | Sherston | 19.00 |
| 1949c | Kid Pix | ESM | 34.00 |
| 5747b | Linkword - French | Minerva | 35.00 |
| 5748b | Linkword - German | Minerva | 35.00 |
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| 0905c | Logo | Longman | 54.00 |
| 5471c | Magpie | Longman | 40.00 |
| 5798b | Micro French | LCL Soft | 24.00 |
| 5931b | Naughty Stories Vol 1 | Sherston | 48.00 |
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| 5926b | Primary Maths Course | LCL Soft | 24.00 |
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| 5485c | Topographer | Clares | 62.00 |
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## GAMES

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|---|---|---|---|
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| 5435b | Battle Chess | Krisalis | 20.00 |
| 5570b | Birds of War | 4th Dimension | 25.00 |
| 5451b | Black Angel | 4th Dim | 25.00 |
| 1978b | Break 147 & Superpool | 4th Dimension | 25.00 |
| 5571b | Carnage Inc. | 4th Dimension | 19.00 |
| 5437b | Champions | Krisalis | 22.00 |
| 5532b | Chess 3D | Mic Power | 16.98 |
| 5572b | Chocks Away Compendium | 4th Dimension | 26.00 |
| 5566b | Chopper Force | 4th Dimension | 19.00 |
| 5577b | Chuck Rock | Krisalis | 17.00 |
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| 5598b | Cyber Chess | 4th Dimension | 26.00 |
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| 5728b | E-Type Compendium | 4th Dimension | 18.00 |
| 1983b | Ego: Repton 4 | Superior | 17.00 |
| 5476b | Elite Gold | Hybrid | 32.00 |
| 5575b | Exotic Adv Sylvia Layne | 4th Dimension | 19.00 |
| 5494b | Games Wizard 2 | Gamesware | 17.00 |
| 5795b | Gods | Krisalis | 19.00 |
| 5574b | Haunted House | 4th Dimension | 19.00 |
| 5547b | Heimdall | Krisalis | 22.00 |
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| 1985b | Krisalis Collection | Krisalis | 20.50 |
| 5595b | Last Ninja | Superior | 18.00 |
| 5546b | Lemmings | Krisalis | 18.00 |
| 5543b | Lemmings 2 - Tribes | Krisalis | 25.00 |
| 5463b | Lotus Turbo Challenge 2 | Krisalis | 19.00 |
| 5582b | Magic Pockets | Renegade | 22.00 |
| 5794b | Oh No! More Lemmings | Krisalis | 15.00 |
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| 5563b | P I A Sam 3 | Superior | 21.00 |
| 5569b | Pandora's Box | 4th Dimension | 17.00 |
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| 5422b | Quark | Oregan | 24.00 |
| 5533b | Real McCoy II | 4th Dim | 22.00 |
| 5565b | Real McCoy III | 4th Dim | 22.00 |
| 5548b | Real McCoy IV | 4th Dim | 22.00 |
| 5597b | Saloon Cars Deluxe | 4th Dimension | 24.00 |
| 5474b | Saloon Cars Extra Course | 4th Dimension | 15.00 |
| 5434b | Sim City | Krisalis | 22.00 |
| 5579b | Simon the Sorcerer | Gamesware | 34.00 |
| 5537b | Small | Virgo | 21.00 |
| 5443b | Spheres of Chaos | Matt Black | 19.00 |
| 5799b | Stunt Racer 2000 | 4th Dimension | 25.00 |
| 5790b | Swiv | Krisalis | 18.00 |
| 5438b | Technodream | Superior | 19.00 |
| 1997b | Virtual Golf | 4th Dimension | 25.00 |
| 5549b | Warlocks | Network 23 | 25.00 |
| 5424b | Xenon 2 | GamesWare | 21.00 |
| 5421b | Zool | Gremlin | 19.00 |

## GRAPHS/DRAW/PAINTING

| | | | |
|---|---|---|---|
| 5521b | ArcLight | Ace | 43.48 |
| 1942b | ArcTist | 4th Dimension | 18.00 |
| 1103b | Artisan II | | |
| 1938d | Artworks | | |
| 0962b | Atelier | | |
| 5499b | Bitfolio | | |
| 5488c | CableNews | | |
| 5469b | Card_Shop | | |
| 5912b | Chameleon | | |
| PCHWb | Chartwell | | |
| 5914b | Craftshop 1 | | |
| 5915b | Craftshop 2 | | |
| 5749d | Designer V3 | | |
| 1937b | Euclid II RISCO | | |
| 5520b | Film Maker | | |
| 1090c | Graph Box Profe | | |
| 0912b | Graph Box v2 | | |
| 5761b | Graph_IT | | |
| 5442b | Illusionist | | |
| 5734b | Image Animator | | |
| 0934b | Imagery | | |
| 5919b | Jiglet | | |
| 1150b | Jigsaw | | |
| 1949c | Kid Pix | | |
| 5497b | Morpheus | | |
| 5937b | Poster | | |
| 1095b | Presenter GTI | | |
| 5492c | PrimeArt | | |
| 0944c | Pro-Artisan 2 | | |
| 5509b | Render Bender | | |
| 5498b | Rephorm | | |
| 5472c | Revelation II | | |
| 5490c | Revelation Imag | | |
| 5938b | smArt | | |
| 1912b | SolidsRender | | |
| 1941b | SuperPlot | Silicon V | 24.80 |
| 5512c | Titler | Clares | 117.00 |
| 5940c | Vector | 4Mation | 75.00 |

## INTEGRATED PACKAGES

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|---|---|---|---|
| 0900c | Advance | Acorn | 88.00 |
| 5427b | DeskTop Office II | Minerva | 74.00 |
| 5489c | Fireworkz | Colton | 145.00 |
| 0901c | Pipedream 3 | Colton | 71.00 |
| 0990c | Pipedream 4 | Colton | 118.00 |

## LANGUAGES/COMPILERS

| | | | |
|---|---|---|---|
| 0938b | ABC III Basic Compiler | Oak | 97.00 |
| 1907b | Cambridge Pascal | Oak | 89.00 |
| 0946c | Desktop Assembler | Acorn | 118.00 |
| 0945e | Desktop C | Acorn | 178.00 |
| 0100b | Easy C | RISC Dev | 49.00 |
| 0110b | Easy C Upgrade | RISC Dev | 10.00 |
| 0905c | Logo | Longman | 54.00 |
| 1906b | RiscBasic Compiler | Silicon V | 77.00 |
| 5428b | RiscForth | Silicon V | 77.00 |
| 1079b | Robo Logo | Silicon V | 38.00 |

## MUSIC/SPEECH/SOUND

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|---|---|---|---|
| 5576b | ARCticulate | 4th Dimension | 19.00 |
| 1091b | Armadeus | Clares | 58.00 |
| 5944b | AudioWorks | CC | 47.00 |
| 5522b | Digital Symphony | Oregan | 42.00 |
| 1971b | MicroStudio | EMR | 66.00 |
| 0835b | Notate | Longman | 42.00 |
| 5461c | Oak-Recorder II | Solent | 39.95 |
| 5486c | Rhapsody 3 | Clares | 77.00 |
| 1939b | Rhythm-Bed | Clares | 38.00 |
| 5523b | Serenade | Clares | 105.00 |
| 5517c | Sibelius 6 | Sibelius S | 160.00 |
| 5457b | Sound Tracker | Leading Ed | 36.00 |
| 5519b | Speech! Arch | Superior | 16.00 |
| 5459b | Voice Generator | MJD | 30.00 |
| 5513b | Vox Box | Clares | 45.00 |

## PRINTER DRIVERS

| | | | |
|---|---|---|---|
| 5527a | Expression-PS | CC | 15.00 |
| 0095b | HP Deskjet Colour Driver | RISC Dev | 15.00 |
| 0090b | Star/Epson Colour Driver | RISC Dev | 15.00 |
| 1940b | SuperDump | Silicon V | 19.00 |
| 5505b | Turbo Driver-BJ Series | CC | 42.00 |
| 5503b | Turbo Driver-Canon Colou | CC | 42.00 |
| 5511b | Turbo Driver-Epson Styls | CC | 42.00 |
| 5508b | Turbo Driver-HP Deskjet | CC | 42.00 |

## SPREADSHEETS

| | | | |
|---|---|---|---|
| 0900c | Advance | Acorn | 88.00 |
| 0929c | Eureka v2 | Longman | 95.00 |
| 0901c | Pipedream 3 | Colton | 71.00 |
| 0990c | Pipedream 4 | Colton | 118.00 |
| 5455b | ProSHEET | Silicon V | 39.00 |
| 1903d | Resultz | Colton | 106.00 |
| 5487c | Schema 2 | Clares | 105.00 |

## UTILITIES

| | | | |
|---|---|---|---|
| 5446c | Almanac V3 | Stallion | 68.00 |
| 0957b | Ancestry | Minerva | 58.00 |
| 1946b | ARC-DFS | Dabs P | 21.00 |
| 5877b | Armlock | Digital | 35.00 |
| 5913b | Chatter | 4Mation | 33.00 |
| 1106b | Compression | CC | 34.00 |
| 5456b | Disc Rescue | Look | 28.00 |
| 5109c | Disc Sharer | Soft Sol | 137.00 |
| 0094b | Hard Disc Companion II | RISC Dev | 45.00 |
| 5445b | Investigator II RISCOS 2 | Leading Ed | 21.00 |
| 5518b | Keystroke | Quantum | 29.95 |
| 5497b | Morpheus | Oregan | 28.00 |

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## Upgrade your Acorn 32-bit machine to a muscle-flexing 8Mb of memory

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### The posers

1. How many bytes are there in 8Mb of ram:
   a 8,000,000
   b 8,388,608
   c 8,192,000

2. Which are 256 colour screen modes
   a Modes 12 and 15
   b Modes 31 and 27
   c Modes 15 and 28

3. What does *ram* stand for?
   a Read all memory
   b Random access memory
   c Random associated memory

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## Acorn Hardware

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|---|---|
| A4 4/60 Mb HD Portable | |
| c/w Acorn shoulder bag | £1699.00 |
| A5000 2Mb Ram / 80Mb HD | |
| Arm 3, Acorn Multiscan | £1275.74 |
| A5000 Learning Curve / 2Mb Ram | |
| as above c/w software | £1318.30 |
| A5000 Home Office / 2Mb Ram | |
| as above c/w software | £1360.85 |
| A5000 4Mb Ram 160Mb HD | |
| Arm 3, Acorn Multiscan | £1445.96 |
| A5000 Learning Curve 4Mb / 160Mb HD | |
| Arm 3, Acorn Multiscan | £1488.51 |
| A5000 Home Office 4Mb / 160Mb HD | |
| Arm 3, Acorn Multiscan | £1531.06 |
| A4000 Home Office System | |
| Arm 250, Acorn Monitor | £935.32 |
| A4000 Home Office Multiscan System | |
| Arm 250, Acorn Multiscan | £977.87 |
| A4000 Learning Curve System | |
| Arm 250, Acorn Monitor | £892.76 |
| A4000 Learning Curve Multiscan System | |
| Arm 250, Acorn Multiscan | £935.31 |
| A4000 HD 80 System | |
| Arm 250, Acorn Monitor | £850.21 |
| A4000 HD 80 Multiscan System | |
| Arm 250, Acorn Multiscan | £892.76 |
| A3010 Action Pack | |
| Arm 250, TV Modulator | £339.57 |
| A3010 / 2Mb Learning Curve System | |
| Arm 250, Acorn Monitor | £637.45 |
| A3020 / 2Mb FD System | |
| Arm 250, Acorn Monitor | £675.00 |
| A3020 / 2Mb FD Multiscan System | |
| Arm 250, Acorn Multiscan | £717.55 |
| A3020 / 2Mb HD 60 System | |
| Arm 250, Acorn Monitor | £825.00 |
| A3020 / 2Mb HD 60 Multiscan System | |
| Arm 250, Acorn Multiscan | £867.55 |
| Acorn Pocket Book | |
| Spreadsheet, W/P, D/base | £199.00 |

## Upgrades

### A3000

| | |
|---|---|
| 2/4 Mb Ram | £Call |
| Joystick Interface | £32.00 |
| Serial Upgrade | £19.00 |

### A3010

| | |
|---|---|
| 2/4 Mb Ram | £Call |
| Joystick Emulation Software | £14.95 |

### A3000/A3010

| | |
|---|---|
| 60 Mb Int Hard Disc | £259.00 |
| 84 Mb Int Hard Disc | £289.00 |
| Joystick (Quickshot III) | £12.00 |
| User & Analogue Podule | £46.00 |
| User & Midi Podule | £46.00 |

### A400

| | |
|---|---|
| 2/4 Mb Ram | £Call |
| 5.25" Ext. floppy disc interface | £39.00 |
| Dust Cover | £9.95 |

### A3020/A4000

| | |
|---|---|
| 2-4Mb Ram | £99.00 |
| Econet Module | £49.00 |
| PC Card 386 1Mb | £225.00 |
| PC Card 486 4Mb | £425.00 |

### A5000

| | |
|---|---|
| 2-4Mb Ram Card | £85.00 |
| 4-8Mb Ram Upgrade | £399.00 |
| Dust Cover | £12.95 |

### A4 Portable

| | |
|---|---|
| A4 Battery Pack | £50.00 |
| A4 Shoulder Bag | £35.00 |

### Cables

| | |
|---|---|
| Arc - 15 Pin to 9 Pin Adaptors | £9.95 |
| Arc - Monitor - 8833 inc sound | £8.65 |
| Arc - Monitor - 8833 II inc sound | £8.65 |
| Arc - Parallel Printer Cable | £5.00 |
| Chocks Away / Stunt Racer (3m serial cable enabling dual play) | £9.95 |
| Keyboard Extender 400/5000 | £7.50 |
| Mouse Extender | £7.50 |

## Expansion Cards

| | |
|---|---|
| Econet Module (A3000/400) | £46.00 |
| Hawk V9 Digitiser (A400/5000) | £199.00 |
| I/O Expansion Card (A400/5000) | £79.00 |
| Midi Expansion Card (A400/5000) | £65.00 |
| SCSI Card - Acorn (A400/5000) | £229.00 |
| SCSI Card - Morley (A400/5000) | £149.00 |

## ROMBO Colour Digitisers

| | |
|---|---|
| A3000 inc. podule housing | £72.30 |
| A400 / A5000 | £65.00 |

## Aleph 1/Atomwide

| | |
|---|---|
| Arm 3 Upgrade | £129.00 |
| 386 PC Expansion Card 1Mb | £399.00 |
| 386 PC Expansion Card 4Mb | £499.00 |
| 486 PC Expansion Card 1Mb | £499.00 |
| 486 PC Expansion Card 4Mb | £585.00 |
| Windows Drivers for above | £25.00 |
| Parallel SCSI adaptor | £40.00 |
| RemoteFS | £45.00 |

## Monitors

| | |
|---|---|
| Acorn Standard Colour AKF30/40 | £199.00 |
| Acorn Multiscan AKF18 | £269.00 |
| Acorn Multiscan AKF50 | £315.00 |
| Taxan 795 Multivision | £499.00 |

## Printers

### Canon

| | |
|---|---|
| Bubblejet BJ-10sx | £175.00 |
| BJ10sx inc. turbo driver | £215.00 |
| Sheetfeeder for BJ-10ex/sx | £48.00 |
| BJ200 | £239.00 |
| BJ200 inc. turbo driver | £275.00 |
| BJ230 | £289.00 |
| BJ230 inc. turbo driver | £329.00 |
| BJC600 (Colour) inc. turbo dr. | £499.00 |
| BJC800 (Colour) inc. s/w | £1369.00 |

### Citizen

| | |
|---|---|
| 120D+ | £114.00 |
| Swift 90 Colour | £169.00 |
| Swift 200 | £199.00 |
| Swift 200 Colour | £225.00 |
| Swift 240 | £239.00 |
| Swift 240 Colour | £239.00 |
| Swift 128K Memory | £35.00 |

(2 Year Warranty on ALL Citizen Printers)

### Hewlett-Packard

| | |
|---|---|
| HP DeskJet 510 | £219.00 |
| HP DeskJet 310C | £279.00 |
| HP DeskJet 550C | £389.00 |

### Computer Concepts

| | |
|---|---|
| Laser Direct (LBP4 Hi Res.) | £749.00 |
| Laser Direct (LBP8 Hi Res.) | £1049.00 |

## Scanners

| | |
|---|---|
| Flatbed A4 256 Grey SCSI (CC) | £745.00 |
| Flatbed A4 without SCSI card | £585.00 |
| Scan Junior Scanner 256 | £199.00 |
| Scanlight Video 256 | £220.00 |

## Printer Drivers

### Midnight Graphics

| | |
|---|---|
| Sprite Dumps | £10.00 |

Swift9/90/24/240, Epson 24, HP Paintjet, Integrex 132/Colourcel, Juki 5520, Star LC10/200/24-200

### Ace Computing

| | |
|---|---|
| Printer JX (Colour Dot Matrix) | £15.00 |
| Printer DJ (HP 500/550C & PaintJet) | £15.00 |
| PRO Drivers (All) | £36.00 |

### Beebug

| | |
|---|---|
| Deskjet 500/550C Driver | £15.00 |
| Star/Epson/Citizen (Colour) | £15.00 |

### BBC/Master Software

Ring for Software List and Prices

### Software Catalogue

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### Archimedes Software

Software Site Licences - Ring for Prices

### 4 Mation

| | |
|---|---|
| Chameleon | £35.00 |
| Desktop Basic Editor | £25.00 |
| Granny's Garden | £23.00 |
| Poster | £75.00 |
| Snippet | £35.00 |
| Vector | £75.00 |

### Ace Computing

| | |
|---|---|
| ArcLight | £55.00 |
| Euclid 2 | £35.00 |
| Mogul | £25.00 |
| Splice | £34.00 |
| Tween | £35.00 |

### Acorn Computers

| | |
|---|---|
| Advance | £88.00 |
| Desktop Assembler (V 2) | £118.00 |
| Desktop C (V 4) | £179.00 |
| Level 4 AUN Software | £399.00 |
| PC Emulator / Free Shareware | £92.00 |
| TCP/IP Programers Pack | £50.00 |
| TCP/IP Protocol Suite | £199.00 |

### Beebug

| | |
|---|---|
| DeskEdit 3 | £24.00 |
| Desktop Thesaurus | £18.00 |
| Hearsay II | £69.00 |
| Masterfile 3 | £45.00 |
| Ovation | £84.00 |

### Clares Micro Supplies

| | |
|---|---|
| Artisan 2 | £43.00 |
| Interdictor II | £25.00 |
| ProArtisan 2 | £109.00 |
| Rhapsody 3 | £80.00 |
| Topographer | £63.00 |

### Colton Software

| | |
|---|---|
| Pipedream 3 | £72.00 |
| Pipedream 4 | £97.00 |
| FireWorkz | £145.00 |
| Resultz | £97.00 |
| Wordz | £75.00 |

### Computer Concepts

| | |
|---|---|
| ArtWorks | £119.00 |
| Canon BJ10/200/600/800 Turbo Driver | £42.00 |
| Compression | £34.00 |
| Equasor | £37.00 |
| Graphics Card | £225.00 |
| HP 310/500/550C Turbo Driver | £42.00 |
| Impression II Borders Disc | £12.00 |
| Impression Business Suppliment | £34.00 |
| Impression II | £112.00 |
| Impression Publisher | £135.00 |
| Impression Junior | £65.00 |
| Impression Style | £95.00 |

### Cygnus Software

| | |
|---|---|
| Twin World | £14.00 |

### Dabhand Computing

| | |
|---|---|
| A3010 Joystick Emulation s/w | £14.95 |
| Arc DFS | £22.00 |
| Visual Backup | £42.51 |

### Database Software

| | |
|---|---|
| Fun School 2 under 6 years/6-8 years/over 8 years | £12.00 |
| Fun School 3 under 5years/5-7 years/over 7 years | £16.95 |
| Fun School 4 under 5 years/5-7 years/7-11 years | £18.00 |

### Empire

| | |
|---|---|
| Pipemania | £16.00 |

### Electromusic Reasearch

| | |
|---|---|
| Creations Discs 1-8 ea. | £19.00 |

### Gamesware

| | |
|---|---|
| James Pond 2 - Robocod | £19.00 |
| Xenon2 | £19.00 |

### Gremlin

| | |
|---|---|
| Zool | £19.00 |

### Hybrid

| | |
|---|---|
| Elite | £31.95 |

### Icon Technology

| | |
|---|---|
| EasiWriter 3 | £109.00 |
| StartWrite | £55.00 |
| TechWriter 2 | £149.00 |

### Krisalis Software

| | |
|---|---|
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# Drawing and painting down under

## Steve Bruntlett looks at Art20

**ART20 is a new art package from an Australian software writer which claims to *bring fine art facilities to Acorn computers at a fraction of the price of other recent art packages.***

It works in any RISC OS screen mode with either RISC OS 2 or RISC OS 3, taking over the whole screen when in operation and offering four screens for simultaneous work, subject to memory availability.

Art20 comes on two disks. The first contains the program, a viewing utility which works quite nicely and a useful printing utility which works with !Printers and offers landscape, portrait and fit options when printing.

It also contains a selection of low resolution pictures including the Kookaburra and a set of pictures based on Mandlebrot patterns. This might lead you to believe that the program has facilities for producing Mandlebrot patterns, but it doesn't.

What about the second disk? Well the Readme file says it contains three examples of art created in Art20 in high resolution Modes 27 and 28.

So what are the images? Two Mandlebrot patterns, which weren't created in Art20 even though they were manipulated using the program, and the Kookaburra again, which looks even better in a higher resolution of Mode 28. This is a good program, but currently let down by the lack of illustrations to show what's possible.

I loaded Art20 into my A4, opted for Mode 27, and clicked on the Paint option, upon which the desktop disappeared to be replaced by a full white screen – Mode 28 gives you a black screen for some reason. I then selected Pen and reduced its size to the smallest possible setting and started drawing. It worked a treat!

Despite its name, Art20 works in any mode, and once up and running it operates with proper RISC OS menus. This means that you can work on the whole screen, but also that you're restricted to a screen size working area. I quite liked working on the full screen without having to bother about sliders and trying to find missing areas of the screen.

The Main Menu covers submenus for Palette, Pen, Line, Shape, Flood, Text, Area, Pixel Edit, Sprite, Mouse and the final option, Desktop, takes you back to the desktop.

The Palette menu is quite extensive, offering a colour palette, a selection of shades or dithered colours and a choice of patterns based on an 8x8 grid. The transparent colour option is used with the transparent painting option to allow a selected colour to behave transparently, as you would expect.

The paint style menu allows options for painting using logical operators including OR, AND, EOR, Invert, ANDNOT and OR NOT. Does anybody really know how to use these effects purposefully and not just at random?

Even the manual says that, *in modes having 2, 4 or 16 colours, the relationship between the effect and the selected colour is arbitrary and the operations less useful.*

You can change to a smaller palette and also alter the mouse and border colour using the Border and Mouse options. The last – Special – option on the menu is rather useful, letting you change the Colour Offset by a particular amount, though again the effects in 2, 4 and 16 colour modes are less predictable than in 256 colour modes.

The Colour Shift option is excellent and allows you to change red, blue and green picture content as well as the contrast, brightness and colour of the image. These changes are controlled using a Colour Shift dialogue box which uses a *before* and *after* thumbnail version of the image.

Even though the pictures are very small they give some idea of what effect on the image your changes are having. Excellent! The final option, Full Contrast, is used to brighten dull images.

The Pen Menu gives you a range of shapes from Point, Dot, Ellipse, Triangle, Diamond, Square and Rectangle to Tall and Wide brushes as well as Fast and Slow sprays. The pens, based on geometric shapes, can be enlarged or reduced as required.

The Tall and Wide brushes produce randomly painted horizontal and vertical lines giving a more textural approach to drawing. These are reasonably useful, but I'd

● *The Kookaburra illustration created by Kim Keefe*

● *Pixel Editor magnifies up to 16 times, but has no shrink options*

### PRODUCT SPOTLIGHT

*Product: Art20*
*Price: £60 inc VAT*
*Supplier: Tekoa Graphics, 16 Murray Road, Rugby CV21 3JN.*
*Tel: 0788 571434*

like to be able to vary the length and angle of the line. The sprays are good and work well in practice. The Line Menu allows single or joined, solid or dashed lines in a variety of widths.

The Shape Menu is comprehensive in offering arcs, segments and sectors in addition to the usual range of triangles, squares, rectangles and polygons.

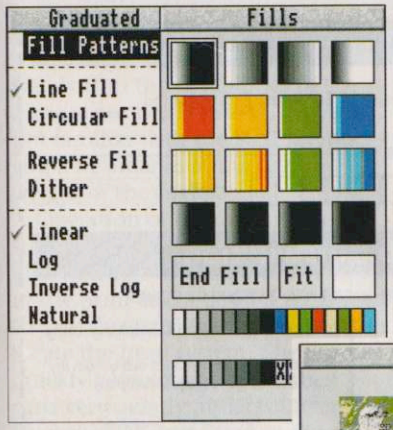
What I really like about these options is the way they've been made more useful than in some other programs. For example, they can be filled or rotated and/or moved when completed.

This seems well thought out and comes from a clear understanding of the use of art packages. This kind of detail occurs in other aspects of the program such as in the Hemisphere option, which is configurable to remove the rest of the screen when completed.

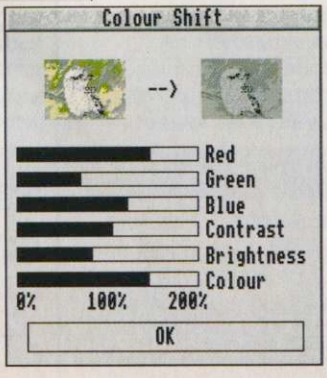
This saves you the complicated job of accurately cutting out a circular sprite from a potentially complicated screen image. A small touch, but well thought out.

The Flood Menu seems endless. There are options for Normal and Graduated flood fills. You can fill, auto-scale or squash sprites vertically or horizontally. There's also a Colour Pick Flood which leaves the colour palette on screen while you change the colours.

This is very useful, as most of the menus disappear when you've made a selection. The Global Replace does what you'd expect it to do and works with Normal, Graduated,




● *There are options for Normal and Graduated flood fills*




● *The Colour Shift option allows you to change red, blue and green as well as altering Contrast and Brightness*

● *My first drawing using Art20's Point tool on my A4*

Sprite Fill and Colour Pick Flood operations, which greatly extends its usefulness.

This extension is typical of most menus in Art20. Talking of extensions, the Graduated Flood menu includes a range of Fill Patterns, Line, Circular and Circular Fills, a Dither option to improve gradation and Linear, Log, Inverse Log and Natural options which control the transition distance between one colour and the next.

This is fairly standard, but the Natural option gives a more realistic method of shading natural objects.

The Text menu is a dead loss – it only works with the System font. Perhaps it would have been better to miss this out completely. You really have to be able to use outline fonts with a package like this, but this is the only drawback.

The Area Menu deals with image processing options. There are the usual Copy and Fill options as well as Soften and Sharpen, which work well enough though there's only one setting, which is a bit disappointing.

The Edge Filter, however, has a threshold setting and a wide range of options including Outline Black, White or Colour and Trace Black or White which are all useful tools and work very well.

Mosaic changes bits of the screen into square tiles in a variety of sizes, Colour Swap swaps colours – naturally, Circle squashes everything selected into a circle while Hemisphere squashes anything in a rectangular area into a hemisphere.

What's the difference? Well, when an area of the screen is squashed into a hemisphere the bits at the edge are smaller than the bits in the middle, which are proportionally larger, so the whole thing looks three dimensional. Excellent.

The Transfer option copies an area offering reflection, clearance and rotation as part of the process. Scale and Stretch do just that and any operation can be cancelled using Adjust.

Next comes the Pixel Editor which is an excellent offering as it magnifies the screen size up to 16 times although it has no shrink options which you could argue aren't necessary on a package which only handles a full screen image.

The Sprite Menu is also extended in what it offers compared to some other art packages, but it only works with rectangular areas of the screen.

Please can we have irregular sprites in the next version along with outline font handling? Sprites are handled using a sprite pool which stores sprites and from which they can be selected for use.

Their use can be varied as can the way you use them. You can reflect or scale sprites and place them using either the corner or the centre of the sprite.

The main development of the use of sprites comes from the Combine Menu. This allows sprites to be combined in a variety of ways with the image on screen such as when blended using the Add option or pasted in strips or blocks when using the Strip or Mosaic option.

This is less flexible than the blending options in some other packages and although it gives a clever effect I'm not sure it's much use in practice.

## Summing up

I enjoyed working with the program and would like to continue to use it in the long term as it has a good feel and a range of extended options not found in some other art packages.

Some options work very well but others are more limited. Overall, Art20 is a good package and good value for money as buying two copies costs £120 and includes a site licence.

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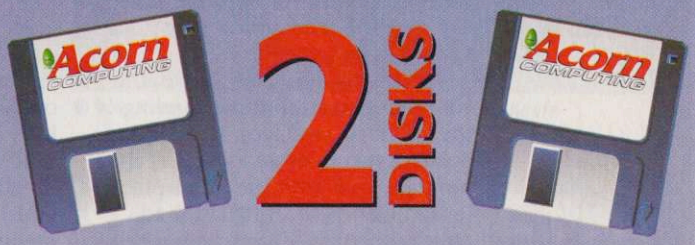


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# Taking and driving can be legal

## Removable hard disks are investigated by Terry Blunt

**HARD disk drives are now becoming so common that they seldom rate a second glance, but not so common is the idea of a removable hard disk. These have been around for some time but there have been doubts about reliability and only Apple really took to them in a big way.**

Now, however, SyQuest have perfected a smaller, yet higher, capacity system. You can have 105Mb of storage on a removable cartridge that is very similar in size to a normal 3.5in floppy. Also, the SyQuest disks come with a five year warranty which demonstrates considerable confidence on the part of the manufacturer.

SyQuest produce two basic drives, an IDE type and a SCSI one, the latter being available as an internal or external unit. The internal versions fit neatly in the slot for a second floppy drive although the colour, a neutral grey, doesn't quite match. The IDE drive has the edge for internal fitting as it draws less power and requires no additional expansion card.

All of these are available from Norwich Computer Services. Further cartridges are also available, and Norwich will supply the SCSI version with or without the expansion card. The packaging of the external drive varies, as Norwich obtain them from several distributors, but the drive itself remains the same.

### Getting started

Fitting instructions are included with each kit and this should be well within the capabilities of the average person. However, if you're not familiar with the SCSI interface you'll be amazed at the size and weight of the cable.

Operation of the drive is quite straightforward. The edge-shuttered disk cartridge is eased into the slot in the front and a small lever is used to lock the cartridge into place and locate the head system. The drive quickly comes up to speed then runs very quietly, much quieter than the IDE unit fitted in the A5000. From here on it performs as any other hard drive.

When you want to change the cartridge you simply dismount the drive from the iconbar. The drive will spin down and the lever will unlock. Moving it all the way back ejects the cartridge. You can also unlock the cartridge by pressing the release button on the front, but I don't advise this as you could end up with data not correctly written back or open files left hanging.

The whole unit is quite sensitive to jolting when the cartridge is in place, even if switched off, so you should always make sure you have the drive in the unlocked state when you move it. Better still, take the cartridge out completely. Like this it is very robust indeed.

### Performance

The review model was an external SCSI unit using the Morley interface. This was tested on an A5000 with the older 40Mb IDE drive. Given the specifications I expected the new drive to be considerably faster.

For most purposes it is, as you can see from the test figures in the table below. The surprise was random access byte handling. This is not very common these days and I suspect the dramatic turn-down in performance is that the SCSI interface and firmware are not optimised for single byte work.

With the general availability of hard drive systems, the idea of making backups or multiple copies of an entire drive in one hit is very attractive, especially where there is a high incidence of accidental deletions. There are many who would appreciate the almost instant recovery of a devastated system.

An alternative approach is to set your micro to boot up from the SyQuest drive and use different disks to boot up totally different environments depending on your need. This has practical applications even in the home.

Dad can boot up his accounts disk, mum can keep her Open University work safe, and the kids can have their own homework and games disks. To auto-boot from the SyQuest drive you need to switch the drive on and move the access lever to the locked position just before you switch your micro on.

Having all your important applications and work on removable media means that working only from this gives you a great measure of security as well as some immunity to virus infection.

### Should you buy?

Whether you need one of these drives depends a lot on what you intend to use them for. The key to the usefulness of the SyQuest drives is the portability and security of the disks, and the drives themselves if you go for an external SCSI unit. Also, the more cartridges you have the greater the economy of the whole system.

You should consider the SCSI unit if you already have a SCSI card, or expect to add such things as scanners and plotters in the future. The SCSI system is also a good option if you are upgrading an old A310. An internal IDE drive would be more appropriate if speed is not critical and you want a neat packaged solution at a relatively low cost.

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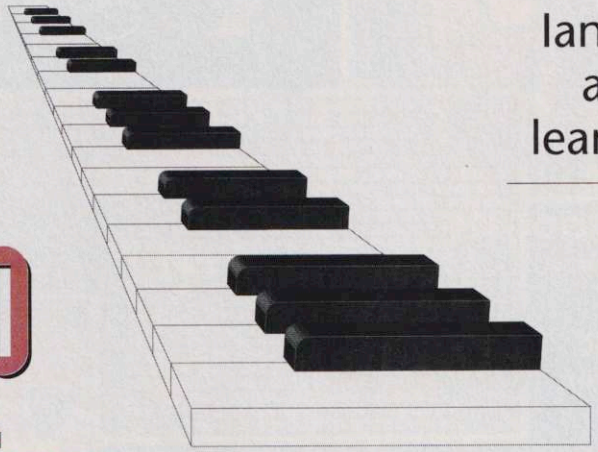


## Ian Waugh looks at a new method of learning your scales

**MAKING music is wonderful. Learning the skill and the art of music-making can be difficult and laborious. Keyboard Trainer sets out to teach the basics of music theory and keyboard skills using 62 on-screen lessons.**

It is designed to work with portable keyboards – the all singin', all dancin' instruments with automatic accompaniments and lots of sounds – so you'll also need a Midi interface for your Archimedes.

There are over 20 preset instrument configurations for the likes of Yamaha and Casio keyboards, plus some for general Midi instruments. You can create your own using !Edit but you'll need a good knowledge of your keyboard to do so.

### Play on

The lessons are divided into three types – study lessons, games and tunes. The lessons are often very short, perhaps only imparting a single piece of information, and many feature simple note-playing and rhythm exercises.

The games include Note Invaders and five-finger exercises dressed up as a routine to launch rockets. Some games, however, such as playing quaver rhythms, use exactly the same format as tutorial exercises.

The screen shows an end-on view of the keyboard rather than a bird's eye view which is what a player would see. I don't think this is particularly helpful and I personally found it disconcerting.

The program uses the multi-timbral ability of the instruments (the ability to play more than one sound at the same time) to play drums and accompaniment lines while you play simple tunes. This greatly increases the enjoyment factor.

### Key Stages

You are often told to press Middle C to move to the next lesson or any other note to try the lesson again. In some exercises it's quite easy to press Middle C by accident, particularly if it's a part of the exercise.

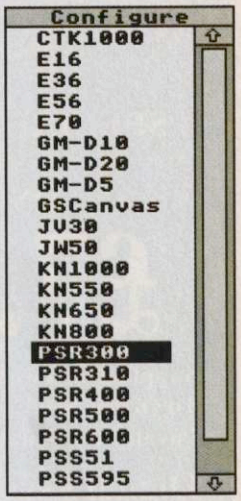
The manual is clear and well-written. It says the lessons compliment the National Curriculum over several Key Stages and cover the ground of a year's tuition. However, I'd be rather disappointed if a student failed to master the skills in the program in far less time, even as short as a few months.

Even the most enthusiastic student is going to get bored if all they can play after a year is *Michael Row the Boat Ashore* and *Kumbaya*. The tutorial doesn't even teach the simultaneous use of left-hand chords and right-hand melody line.

One niggle is the lack of a cumulative score or a reward feature (for younger players). Once you finish a lesson, you move unceremoniously on to the next one. Even those lessons with scores don't tell you what they mean and it's up to you to decide how well you've done.

For example, one rhythm exercise scores you out of 24,000 (!) but even very accurate playing is unlikely to produce a score much over 23,000. Is that a good score? In an educational system which expects nothing less than 100 per cent, you're not sure. This lack of any cumulative or *hi score* means you can't easily monitor your progress.

However, Keyboard Trainer is a nice idea well presented, and although it obviously has an eye on the educational market, it could also be used just as well at home by any aspiring musician. For once, the blurb is right – it's suitable for anyone from eight to eighty.




● *Keyboard Trainer comes with over 20 configurations for a wide range of keyboards*

### PRODUCT SPOTLIGHT

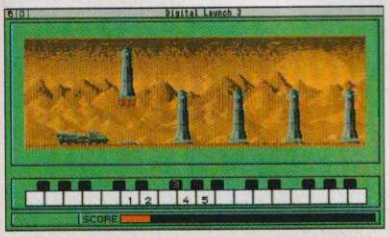
*Product: Keyboard Trainer*
*Price: £79.95*
*Supplier: Minerva Software, Minerva House, Baring Crescent, Exeter, Devon EX1 1TL.*
*Tel: 0392 437756*
*Requirements: Midi interface*

### Summing up

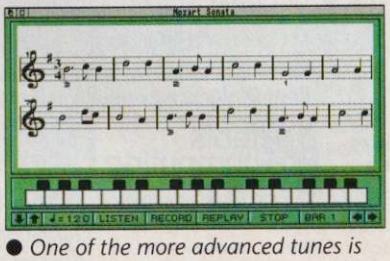
Teaching music is a dirty job but someone has to do it and Keyboard Trainer makes it as interesting as it's probably possible to be.

It will, indeed, take you from your very first steps at the keyboard to playing simple tunes. It's good to see a tutor which acknowledges the portable keyboard as a musical instrument and actively uses it.

However, it is very much a Getting Started guide and you will certainly need supplementary material. But if you've tried to learn a keyboard before and failed, try this before you give up.



● *Use five-finger exercises to launch the rockets before they are destroyed by the tank*



● *One of the more advanced tunes is an extract from a Mozart Sonata. The notes change colour as they play*

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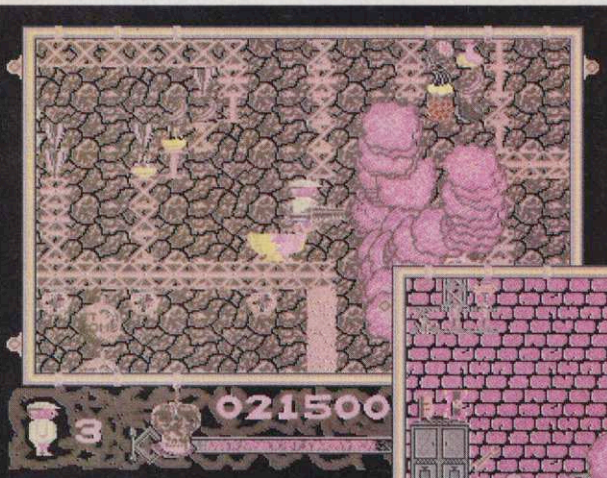
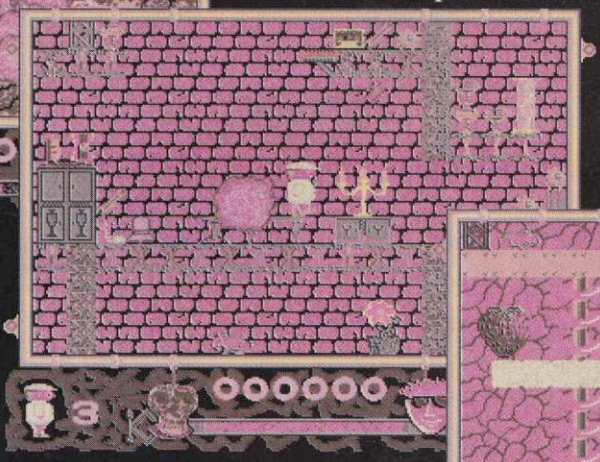
# Asylum

**A platform shoot-em-up in inner space....**





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Click on Memphis in the Easy Font window.

This is the font menu directly after the above operation, and as you can see, Memphis is now available.

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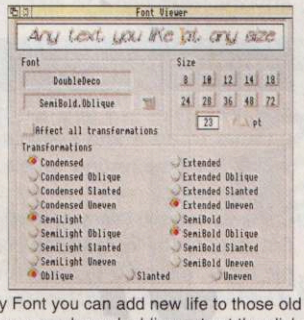
Trinity

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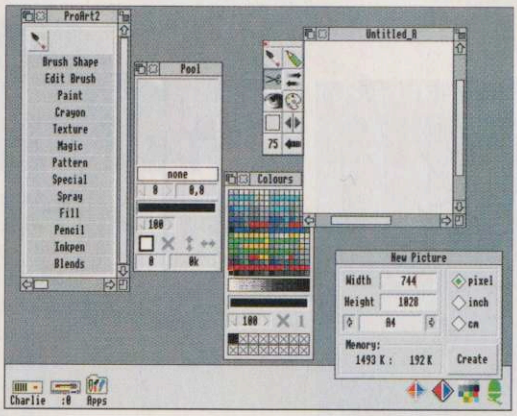



● *The new improved ProArtisan – looking good*

# New and improved

## Chris Kecun takes a look at the finished version of ProArtisan 2

**LET'S get straight to the point – what does the full release version have to offer over the beta test version we have all been raving about? The manuals, small text and frequent illustrations looked simple to read and the Interactive Help application is always handy to give you a hint as to the purpose of each icon and option.**

The program disk contains a simple program to maximise memory, the obligatory Scrap and System folders and an invaluable program called Options which lets you switch off functions within ProArtisan 2, which you might feel are inappropriate for some people or purposes.

When first loaded the program demands that you go through an installation procedure. This records your personal details, making it unique and ensuring that you'll get any upgrades as they become available.

To start a new page you must enter the required size or resort to one of the defaults, some of the more notable being screen, A4 and label sized. The tool bar to the left of the work window consists of keys to a logical menu system which is designed for ease of use. Each icon represents a different list of menu options.

What surprised me was the small number of keyboard shortcuts compared to those found in Computer Concepts products. The many options are easy to find in their respective menus but they are not always quick to get to.

ProArtisan 2 works quite happily in RISC OS 2 but RISC OS 3.1 is recommended. It also allows you to switch between current working modes even as you work, without affecting your picture.

All of the tools found in the previous Clares packages are included and much more. Some of its features have been touched on in a previous issue but others have come to light in the release version which are worthy of applause.

For example, it is possible to wash a pattern over an area by using the brush texture tool, giving a convincing appearance ranging from sponge to concrete. The spraycan option is just as flexible as an airbrush, allowing you to adjust size, density and centre weight.

Under the drawing menu the programmers have given serious consideration to how line paths are defined, whether they be open or closed, or enclosed areas filled with the same colour as the line, or not at all.

This is all covered under the style menu operation. The sprite menu, represented by a pair of scissors on the toolbar, lets you open the sprite pool, a familiar, friendly, and powerful area known to all Artisan users.

Perhaps the most remarkable feature in the application is the Frisket tool. As the manual explains, this word originally referred to a frame on a hand printing press that carried a piece of parchment to protect the non-printing areas.

An excellent idea which works like a piece of masking tape covering areas that you want to keep untouched. Any airbrush user will immediately see the advantages.

Two of the ingenious process filters, colour and grey shift, let you systematically alter the colour composition of your graphic. Some of the interesting effects included are emboss, sharpen and pattern. These, and the total interchangeable quality of tools, colour and sprites, make ProArtisan 2 a powerful force in Acorn image processing.

A final feature which impressed itself on me works like Impression's document store. ProArtisan 2 allows you to import drawfiles, load and create sprites one after the other and retain them in memory – space permitting of course.

That means you can bring back, or remove, any of the previously loaded or created files without having to reload from the disk. You then save your picture as Acorn squashed files or as normal sprites.

● *Utilise the sprite pool and supplied resources for inspiration*

● *Processes include Frisket, protecting areas you want untouched*

### PRODUCT SPOTLIGHT

*Product: ProArtisan 2*
*Price: £135 (inc VAT) Upgrade from Artisan/ProArtisan £67.50 (inc VAT)*
*Supplier: Clares, 98 Middlewich Road, Rudheath, Northwich CW9 7DA.*
*Tel: 0606 48511*

### Summing up

ProArtisan 2 will appeal to existing users who will see for themselves the useful additions and enhancements of the new version. For those who are new to art packages on the 32-bit machines, ProArtisan 2 is a powerful, yet delicate, tool which can be used by master and novice alike.

# And now, the weather...

## Mike Goldberg gets involved with a deepening depression

**USUALLY the first greeting exchanged between two people is a question like "How are you?" followed by a rhetorical statement "terrible weather we've been having for this time of year". This obsession with the weather stems from the ever-variable climate of this country and is reflected by ever-variable ways of displaying weather conditions and records.**

● *Where has the rest of the world gone?*

Can you remember the TV Weather-persons of yesteryear with their stick-on weather icons? It was usually some poor bloke wrestling with a handful of not-so-adhesive symbols of rain and clouds in front of a grey map of the British Isles. But what about those symbols? Straight out of a 4th year geography lesson.

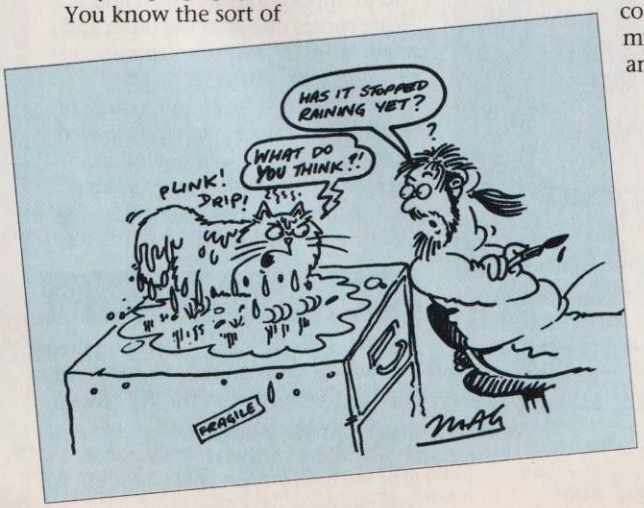
You know the sort of thing, triangles representing showers, black spot for rain – or was that Blind Pugh? Anyway, there was this chap valiantly attempting to tell us about intermittent showers over Halifax while failing magnificently to nail the necessary symbol to the relevant area.

Things have come a long way since then and now weather conditions can be displayed and manipulated instantly with animated icons that leave one in no doubt as to what information is being conveyed.

For some unaccountable reason I have had the compulsion to keep my own static weather records for the past five years – people say I should get out more.

However, I have kept them in what I think is a more humorous and enjoyable fashion than a strictly accurate verbatim account of each raindrop that fell and wind direction.

So I thought it was about time I implemented a computer version of my written records, and here is the first part. The program *Weather!* as it stands now, displays a map only of England, Wales and Scotland (sorry, there's no Northern Ireland, Eire, Shetlands, Hebrides or Channel Islands – my hand scanner wasn't wide enough to encompass everything and packed in completely after scanning the mainland).




As with the British weather, my programming hit some quite unpredictable turbulence halfway through completion which is why this article is in two halves – more on this later.

What we have at the moment is the mainland occupying centre stage with 26 icons in pairs forming a menu down the right hand side. You can use the mouse to select the weather symbol and the nature of the weather will be displayed above the map.

Now move the mouse over Britain and the icon selected will appear stuck to the mouse pointer. Click select again to position the symbol over the map.

Simple eh? Well yes, picking and dragging like this is easy enough to program and you would not imagine there to be any problem with removing a misplaced symbol would you? If you click Adjust over a fixed symbol it will be removed, but it wasn't always like that! I spent nearly half a day fixing a bug that, like all bugs, was annoyingly obvious when spotted.

Just like the weather, even with the best of equipment and reasonable knowledge and experience, programming can throw up some totally unpredictable results and make you ponder whether or not you really know

what you are doing.

I make no apologies for including these seemingly irrelevant observations, as computers can make fools of us all – remember if there's a computer error it *really* means it was programmed in error. Indeed, the program as it is now is in it's tenth iteration complete with on-going REMs and untested memory limitations.

It does include a hint of what the complete program will look like – try placing the rain icon or the boiling sun icon and you will see what I mean. The complete program will animate most if not all of the weather conditions, and you will be able to store and retrieve each day's weather from separate files.

At the moment you can inflict up to 40 symbols on the map denoting how the weather might be in various parts of the country. Of course you can just keep localised records (as I do) so that the symbols used only reflect what befell your part of the country.

As usual, the idea of my program is for you to personalise it and modify it with your own designs. Just load up the sprite file *Maps* and tear into those icons with the obvious names. The ones with less than obvious names like *go11mod0* are working names of the animated parts and may or may not retain meaningful titles – but by all means alter these too.

You may wonder why I have used leaves to denote wind ferocity. Well, if I'm looking out of the window trying to gauge whether or not it's pleasant enough to go out cycling I always look at the trees to see if they are swaying about or not. This is what I call the scientific approach.

● *It's precipitating all over the place*

Perhaps for gale force winds I should have used a broken fence, as mine always seems to get flattened or appear in someone else's garden when there's the occasional hurricane.

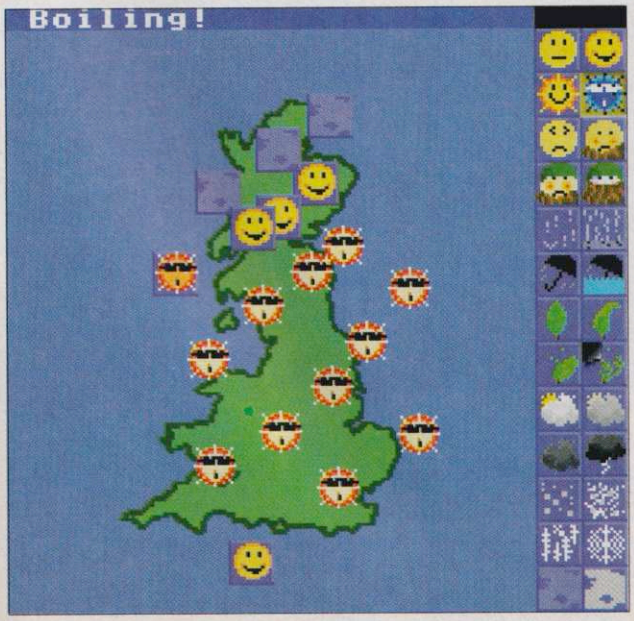
The icon for sunshine is an obvious one – when we get to see it – but for extreme cold I've tried to represent the layers of clothing sported by your average Northerner when taking the whippet out for a walk. And that's in July.

Of course you do not have to use the British Isles as a map either. Why not draw a map of your own town or county and save it as *Map1* in the sprite file *Maps*? In fact, why didn't I do that? It was local weather I wanted to keep records of more than national – anyway, the choice is yours.

● *We've the icons – whatever the weather*

Change, too, the actual names of the weather which are stored as DATA at the end of the program. I have called one cloud condition *grim* but there is nothing to stop you altering it to *miserable* or *depressing*. You could include *earthquake* on the grounds that on April 2nd 1990 this country suffered a very noticable one – well it rocked our house 120 miles away from the epicentre – although the frequency of such an event may render its inclusion somewhat less than necessary.

So if you want 12 icons for various temperatures or levels of rain stick them on and call them what you want – it's your weather and you're welcome to it. Don't miss part two in the next issue, weather permitting.




● *Now isn't that a lot better? (Summer 1902)*

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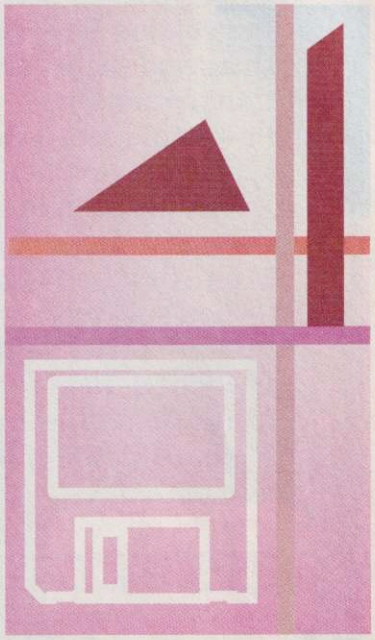
# Don't bug me!

## It's good but it's not right. Michael Rozdoba examines more menaces and agrees



**THIS month's column is dedicated to Roy Walker as a tribute to his outstanding contribution to the world of entertainment.**

First off this issue, a brief warning. TechForum is a place for exchanging programming tips, bug info and other problems. If you have a problem to pose or some advice to give, please write in.

Last month I mentioned that there are some problems with !Paint, when using it to edit sprites with 256 entry palettes. I promised to give more details this month and I wouldn't want to break a promise, so here's a list of naughty bits:

- Sprite size can't be extended, either by adjust size, or insert row/column – if you attempt this operation you get a sprite extend error claiming there isn't enough room, regardless of the amount of memory available.
- A block can be neither moved nor copied correctly using the export option.
- It appears that certain operations will corrupt data in the sprite header.

This last one is a rather insidious bug as it isn't usually apparent that anything is wrong until sometime after the data has been saved to file, possibly overwriting an earlier uncorrupted version.

Such problems manifest themselves through what seems to be corruption of one or two rows at the bottom of the sprite image.

However, if these are deleted, the problem is not removed. Instead it merely moves up to what are now the lowest rows in the sprite. This suggests it is caused by corrupted data in the sprite header.

In this case it is often possible to fix the problem by running the sprite through ChangeFSI, if set up appropriately. For a 256 grey-scale sprite this is easily accomplished using 8 bpp output with special option *d* selected.

To some extent the other problems can be worked by saving the palette out of the sprite before performing the operation concerned, then removing the palette, carrying out the action and finally loading the palette back into the sprite.

The only trouble with this, apart from being rather cumbersome, is that the sprite often becomes unintelligible after the palette is removed, making it impossible to judge where to apply tools such as copy block.

### Menus and input foci

Here we have yet another member of the Acorn stable of thoroughbred Wimp bugs.

If a window, acting as a menu leaf item, temporarily gets the input focus, and the original focus owner is closed before the menu is deleted, you can get into serious bother.

The Wimp is unable to set the focus back as the original owner has closed, and rather than discarding the focus, it behaves most improperly:

If you issue a Create menu call with pointer set to -1 – to delete the menu – the Wimp will return an *input focus window not found* error.

Now, if you ignore this, rather than killing your application, and you delete the window used in the menu after removing it, a stream of *illegal window handle* errors will then be generated.

This seems to occur because the Wimp is unable to set the focus back to the now disappeared window so it continues to assume it is in the menu's leaf window. So if that has been deleted as well, trouble is inevitable.

Fortunately, there is usually an easy way to work around this one.

Avoid explicitly closing possible owners of the input focus in response to a click in a menu's leaf dialogue box. Instead, set a flag to mark pending closure, and after the menu has been closed, close any other windows if, and only if, the flag is set.

This can be an awkward bug to trace in the first instance, if you aren't aware of its cause and are using a compiled library of Wimp support functions, as the errors may occur in response to calls made by library functions.

In the case of Acorn's RISC_OSLib, if you are using the *dbox* functions to attach windows to a menu, a call to *dbox_dispose* will result in a call to *event_clear_current_menu*, which deletes the menu, wrapping the wimp call up in *wimpt_noerr*.

Hence if this error occurs your application will die as soon as you call *dbox_dispose* and without the library source code it's virtually impossible to trace the original cause of the error.

RISC OS – it's good but it's not right.

### Coming soon

Want to know whether Christmas of 1944 fell on a Sunday or a Monday?

Next month I'll show you how to solve such problems in two lines, without any complex calculations, using the operating system to do all the hard work for you.

### Stop me, buy one!

Don't forget, 42 may be the answer, but we have yet to discover the questions. If you have a question, it is your duty to society to write in, so do it NOW.

To: TechForum,
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# Being in control

Steve Turnbull looks at three products you can use to improve your skills

## C-ing the light

**AS programming languages go, C is probably the most commonly used anywhere – on the grounds that although Basic is provided with most home computers, it isn't actually used much. It's a very powerful language, which means that you can make it do just about anything you want, including jumping through hoops and making the tea.**

Unfortunately it's also quite expensive, Acorn's development system is at a price that exceeds most people's pockets and installation alone is enough to put anyone off. You also need at least 2Mb of ram and a hard disk with plenty of space.

This is where Easy C comes in. If you want to learn to program in C but don't have the resources (financial or computer) to use Acorn's version, Easy C is what you need.

You can run it on a 1Mb machine with just a floppy drive – although a hard disk is better, of course. Installation? Well there isn't any, the C application is self-contained so you can just double-click to run, or copy it on to a hard disk then double-click it. It really couldn't be easier to get started.

It's something of a tradition when learning a new language that you persuade it to print *Hello World* on the screen. This package is no exception and the instructions guide you through the six simple drag and click operations – which includes launching Easy C itself – needed to make this happen.

Having got you through that stage, the excellently produced manual begins to explain the way C programs are put together, file structures, how to use the important *c*, *o* and *h* directories and also how to use the *Make* facility.

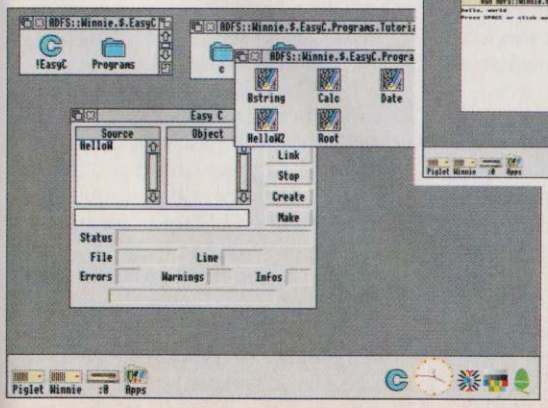
When creating larger C programs it's usual to *divide and conquer*, putting sections of the program into different files – in fact, in a large program you might be creating several separate pieces of code which work together. Doing this manually can be quite laborious and it may be difficult keeping track of what sections depend on what other sections.

*Make* is a system which keeps track of file dependencies and what sections go to make up which pieces of code. In Acorn C the Make program is separate and is treated as an addition – even though it's essential – but it's an integral part of Easy C and very easy to use.

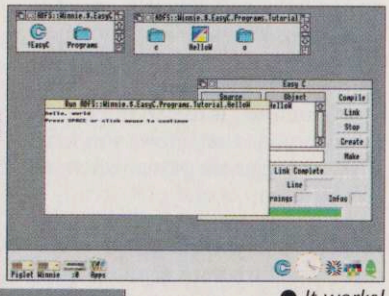
What makes Easy C different from Acorn C is in the support libraries that are supplied. In order to make C easily transportable from one computer to another, (at least in theory) all the major routines are actually supplied separate to the language itself in the libraries. There's a standard input/output library, a maths library and so on.

Acorn C comes with a RISC OS library which gives easy access to the Wimp Manager, Font Manager and lots of other aspects of the machine. Easy C doesn't, you just get a standard C library and a thing called ROSLib which gives access to machine specific functions such as *os_adval*, *os_file* and so on.

Easy C does come with the ability to build your own libraries so there are possibilities for developing Wimp, Font and other types of handling routines.




● *It takes only simple steps to compile a C program*



● *It works!*

There is a second, free, disk that comes with the package, which contains all the libraries for easy interfacing with the facilities provided by RISC OS.

### PRODUCT SPOTLIGHT

*Product: Easy C*
*Price: £49*
*Product: Wimp Programmer's Toolkit*
*Price: £18.68 + VAT*
*Product: Basic Programmer's Toolkit*
*Price: £15.28 + VAT*
*Supplier: RISC Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS.*
*Tel: 0727 840303*

Since Easy C is intended to be for beginners to the language it also includes a tutorial section on programming in C – unlike Acorn C where it's assumed you know what you're doing. The tutorial occupies about 35 pages and though it covers the ground fairly rapidly it does manage to give enough detail to make it useful – I learned something and I'm supposed to know what I'm doing.

The good thing about the tutorial is that it doesn't make *any* assumptions beyond the reader having a working knowledge of Basic. Initially it uses comparisons with Basic keywords to develop equivalent routines in C. Additionally, there is also a set of tutorial programs on the disk.

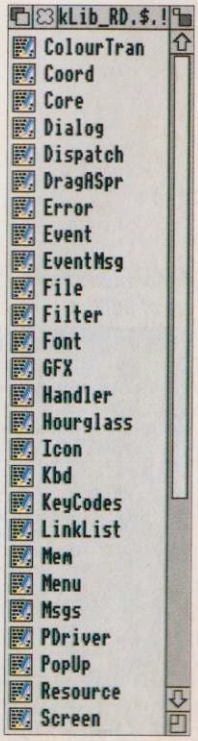
### Summing up

Easy C is an excellent compiler that is easy start up and very easy to use. I'm very impressed and I'd recommend it to anyone who wants to start programming in C.

## Programming the Wimp

This pack consists of a set of 12 utilities, which may be of use to programmers who are fighting with ➤

● *The free disk has some handy libraries included*



➤

the Wimp in an effort to create usable programs.

The programs are supplied on one disk and there's a very nicely printed 60-odd page manual, which starts off with a friendly introduction about how superb RISC OS is in comparison to other wimp systems, which is true, and how easy it is to create multitasking programs in any language.

Each program can be run directly or from the provided menu system and this is what you get:

*FormEd* is Acorn's very own window template editor. This is not bad although I found the PD program !Glazier easier to use – but if you don't have either this is very useful.

*MenuEd* is supposed to do for menus what FormEd does for windows, that is, it provides an environment in which it's easy to put together a menu, including connections to sub-menus. To use it within your own programs you have to be working in Basic and include a library of routines that are supplied.

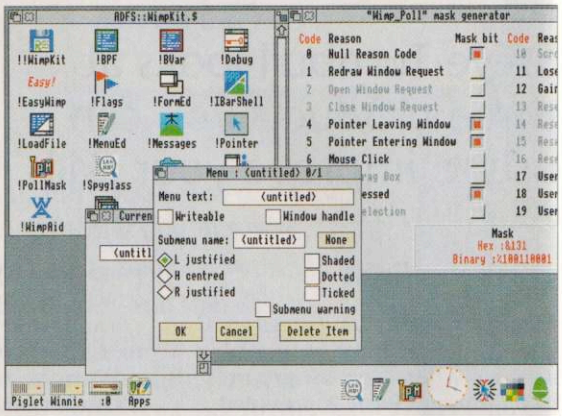
*WimpAid* displays information related to the current Desktop environment: Current window and icon data, information about the pointer's position, there's also a SWI information index which lists all the Wimp SWI calls and indexes into both RISC OS 2 and RISC OS 3 programmer's reference manuals.

*Tempi* is an unusual item. It gives lots of useful information about window templates and you can drag a window template file on to its icon, whereby it then lists all the templates available and brings up a window.

This includes other numerical data on a windows opening position, visible work area and so on, plus you can check every icon. All this information can be saved as a text file.

*BarShell* is a Basic skeleton that helps you write simple programs that have an icon on the iconbar, while *EasyWimp* is similar, but helps you write programs based on a single window.

● *This set of utilities is packed with goodies*




*Flags* is a very handy utility that helps you create the hex numbers needed when defining windows and icons – you select the window/icon type you want, click the options and the program delivers the numbers.

*PollMask* is similar but generates the flags for the Wimp_Poll mask word.

*LoadFile* allows Basic programs to be loaded into the Basic Editor directly from the Desktop – this is only useful in RISC OS 2.

*BPF*, Basic Procedure and Function analyser, takes your Basic program and delivers a complete listing of every procedure and function that's defined and how big it is, plus whether it's actually used.

It lists any procedures that are called but not defined. Unfortunately it doesn't account for routines in libraries that may be installed by the program. It's complemented by *BVar* which provides a similar listing for variables.

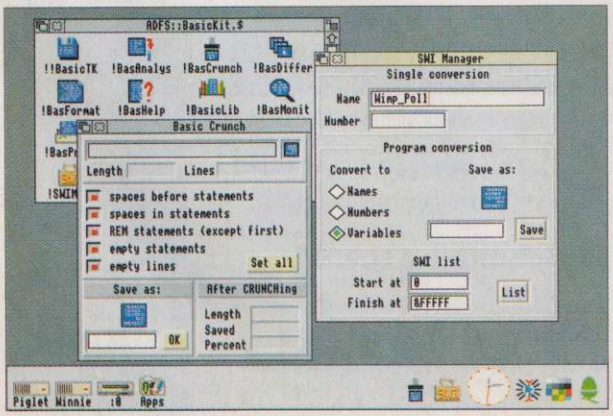
*Debug* displays a window with text lines on it. A running program can output to it – using a library program that can be installed – thus helping to find out where a program may be going wrong. It will also display a block of memory.

*Spyglass* is a more advanced version of Debug that will display the memory of any multi-tasking application while it's running.

*Messages* monitors the messages that are being passed around from task to task. It displays the message data along with a description of what it's about, but it also allows you to send specific messages to tasks and their windows. It has an important tutorial mode that allows you to see what messages are passed when certain Wimp operations occur.

Finally there is a set of Wimp routines that you can use in your own Basic programs to make using the window environment easier.

● *An interesting set of utilities*




## Doing it in Basic

This is a set of ten utilities designed to make the life of the Basic programmer even easier.

*BasicPrint* is a printer driver specifically for Basic programs, you can configure it for your printer and then just drag a Basic file on to it. It handles indentation of structures automatically and you can limit the printing to a subset of the lines.

*Basic Program Formatter* intelligently unpacks crunched programs making them more readable.

*SWI Manager* allows you to convert SWI names to numbers and back again, plus produce a list of all the SWIs currently known to your machine – although you can limit the number to a specific range. The clever trick is that you can save the conversions as Basic, making it easy to incorporate into your own programs.

*Basic Program Analyser* provides the functions of both the *BPF* and *BVar* from the Wimp Programmer's Toolkit, plus it will measure the length of any section of the program.

*Basic Program Cruncher* removes spaces, REMs and empty statements or lines – it doesn't shorten variable names.

*Basic File Differentiator* – a long name for a program that compares two Basic programs to see how they differ. It outputs an Exec file which would modify the first program to produce the second. It notes changes within a line as well as omitted and added lines.

*Basic Help* gives information about Basic keywords and if you give it an error number it will display the appropriate error message.

*Basic Program Monitor* allows you to view a Basic program in memory – can't really see a use for this one, but you never know.

*Procedure Library Manager* enables you to build up a selection of your most used routines and extract them when you want to add them to a specific program you're developing – a library of routines is also supplied on the disk.

These are not the kind of programs I would use personally – though I do use Basic – but a Basic programmer just past the beginner stage could find them useful.

# At a stroke

## Better than a box of coloured pencils. Well, almost...

**ONE of the best applications supplied in rom with your machine is Draw. It's very neat, simple, yet a particularly powerful drawing tool which uses vector graphics to define a picture.**

However, the Draw application itself doesn't actually produce the shapes by itself – the Draw module (part of the operating system) performs the intricacies of drawing the shapes on the screen. This is one of the reasons why drawfiles are so widely supported – it's really rather easy to do.

A drawfile consists of separate objects, some of which are paths. These are stored in a format which can be passed directly to the Draw module, along with attributes such as line thickness and colour.

The Draw module always performs operations on paths, either outputting a new one or drawing (referred to as stroking) it on the screen.

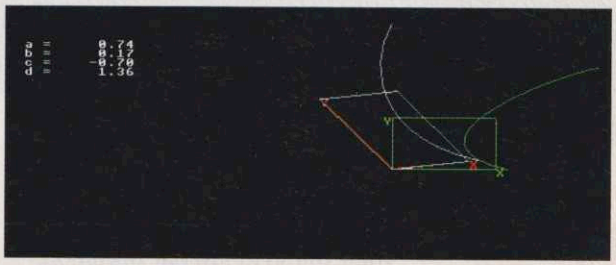
A Draw path consists of several elements, each of which is from one to seven words long. An element is something like a line, a curve or a gap. The first word in an element specifies its type, and is followed by a variable number of parameters. See Table I and its notes for details of the elements available.

A path contains one or more subpaths. Each is started by a type two element (start subpath) and is ended by either a type four or type five element (end subpath). You should always end subpaths explicitly, even if it's the only one in the path. Look at the example programs for examples of paths.

### Coordinate systems

Looking at the descriptions of the elements in the table, you may have wondered what units the coordinates use. The simple answer is *whatever you want them to be in.*

The Draw module uses no less than four coordinate systems. The paths are defined in *user units* converted into internal *draw units*, which are then stroked on to the screen using *OS units*. The conversion of user units into internal draw units is controlled by a transformation matrix, specified in *transform units*, explained below.



● *You can twist objects with the Draw module*

OS units are nominally 1/180th of an inch, and are what the VDU system uses – MOVE, DRAW and similar commands in Basic. Internal draw units are 1/256ths of an OS unit, and are stored in signed 32-bit words which gives a maximum size of around two kilometres. This is probably large enough for most purposes.

Transform units are fixed point numbers. This is like a floating point number – as in the floating point emulator – except that the sizes of the integer and fractional parts are fixed, and so are much faster to process.

Transform units divide a four-byte word into two 16-bit fields (two bytes each). The effect of this is that a transform unit is 2^16 (65536) times a real number, stored in an integer... don't worry, this will all become clearer later.

As mentioned before, user units are whatever you like. However, you should be wary of making them too different from internal draw units as scaling and rounding errors may occur. This usually manifests itself as curves drawn as lines, but there's nothing to worry about in the normal range of magnifications though.

### Transformation matrices

A typical application using the Draw module may want to magnify, change the aspect ratio and rotate a drawing, all at the same time. It ➤

**Table I: Element types**

| Type | Parameters | Description |
|---|---|---|
| 0 | | End of path |
| 1 | ptr | Continuation of a path, ptr points to the first word of the next element |
| 2 | x y | Move to (x, y) starting a new subpath |
| 3 | x y | As type 2, but doesn't affect the winding rule. Mainly for the draw module's internal use |
| 4 | | Close subpath with a gap |
| 5 | | Close subpath with a line |
| 6 | x1 y1 x2 y2 x3 y3 | Bezier curve to (x3, y3) with control points (x1, y1) and (x2, y2) |
| 7 | x y | Gap to (x, y) |
| 8 | x y | Line to (x, y) |

All lines and curves start at the end point of the last element. The path is stored in consecutive words in memory. The first word of an element contains its type, and it's followed by its parameters in the order they are in the table.

## Table II: A user's guide to transformations

In the following entries, *m* is the magnification factor, and *theta* is an angle. Set *m* to scale your path to internal draw units, and remember to multiply the numbers by 2^16 to turn them into transform units.

| a | b | c | d | Effect |
|---|---|---|---|---|
| m | 0 | 0 | m | Enlarge m times |
| m * cos(theta) | m * sin(theta) | m * -sin(theta) | m * cos(theta) | Enlarge m times, rotating it by theta anti-clockwise |
| m | 0 | k * m | m | Shear so (0, 1) maps to (k, 1), x-axis invariant |
| m | k * m | 0 | m | Shear so (1, 0) maps to (1, k), y-axis invariant |
| m * cos(2 * theta) | m * sin(2 * theta) | m * sin(2 * theta) | m * -cos(2 * theta) | Reflect the path in the line y = x * tan(theta) |

The program *Example2* on the MegaDisk demonstrates these transformations.

➤

would be a little slow to perform one operation after another on each path of a drawing, so it would be really useful to be able to do all these things in just one operation.

Luckily, the world of mathematics comes to our rescue with something called a *transformation matrix*. This can do any number of operations on a path all at the same time and is much quicker than other methods.

You can use a transformation matrix with every call to the Draw module to scale the user units into internal draw units, but you can also change the shape of the path at the same time.

To see what you can do with matrices, look at *Example1* from the Megadisk. A green path is displayed, which is the original path before transformation. Move and click the mouse to set the x and y axes, and then the transformed path will be drawn in white. Notice how the sides of the *square* lie along the axis you set, how its shape is distorted, and how the curve changes under the same transformation.

The matrix is specified as six numbers, imaginatively referred to as *a*, *b*, *c*, *d*, *e* and *f*, stored in consecutive words in memory. The 2x2 matrix (*a*, *b*, *c* and *d*) is in transform units and the translation coordinates (*e* and *f*) are specified in internal draw units to allow greater movement than a transform unit would allow – just 256 OS units, not very far.

The result of the transform is that a point (*x*, *y*) is mapped to a point (*x'*, *y'*) like this:

```
x' = ax + cy + e
y' = bx + dy + f
```

To transform a path, each point in every element of the path is run though the matrix.

The effect of the matrix is to alter the two axes of the path by effectively rotating them around (0, 0), so a point (1, 0), which lies on the x-axis, is mapped to (*a*, *b*), and a point (0, 1), which lies on the y-axis, is mapped to (*c*, *d*).

However, you needn't worry too much about this – Table II is a practical guide on how to use the transformation matrix.

To place your six numbers into memory to pass to the Draw module, use codes like:

```
DIM transform% 24
transform%!0 = a * 2^16
transform%!4 = b * 2^16
transform%!8 = c * 2^16
transform%!12 = d * 2^16
transform%!16 = trans_x%
transform%!20 = trans_y%
```

*a*, *b*, *c*, *d* are floating-point numbers and *trans_x%* and *trans_y%* are the translation coordinates in internal draw units.

## Table III: Cap and join format

| Word offset | Byte | Description |
|---|---|---|
| 0 | 0 | Join style (0 = mitred, 1 = round, 2 = bevelled) |
| | 1 | Leading cap style (0 = butt, 1 = round, 2 = projecting square, 3 = triangular (arrow head)) |
| | 2 | Trailing cap style (as leading cap style) |
| | 3 | Must be zero |
| 4 | | If you are using mitred joins, the mitre limit, in transform units |
| 8 | | If the leading cap style is triangular: |
| | 0, 1 | The width of the leading arrow head in 256ths of the line thickness |
| | 2, 3 | The height of the leading arrow head in 256ths of the line thickness |
| 12 | | If the trailing cap style is triangular, the size of the trailing arrow head in same format as for leading cap style |

Experiment with the Draw application to see what all the parameters do. The mitre limit controls at what point a mitre join will be converted into a bevel join so that lines which join at small angles don't look too odd. I suggest a value of &100000 for this.

## On a screen near you

After all this, you may be wondering how to draw something on the screen. It's a lot easier than you might think. I'm going to cover the two main Draw SWIs: *Draw_Stroke* and *Draw_Fill*.

As with the Basic MOVE and DRAW commands, you first need to set the colour. You can use the GCOL command, but I would recommend using ColourTrans – see the panel for details on how to use ColourTrans.

Paths should be stored in a reserved memory area, claimed from Basic using the DIM command. For example, to reserve an area 1k long and place its address in *path%*, use the command:

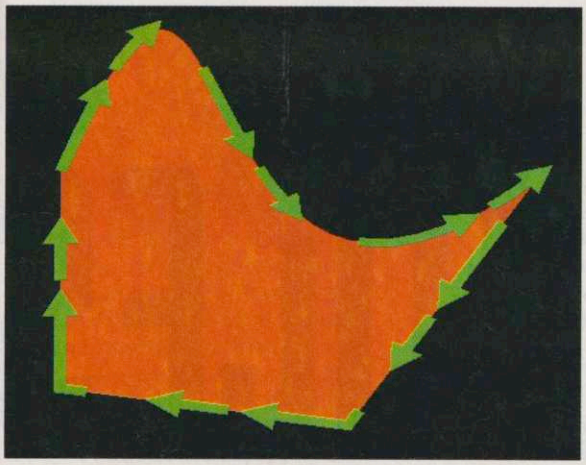
```
DIM path% 1024
```

You then need to store the path in the array. To store a number in the nth word, use:

```
path%!(n * 4) = 42
```

Look at the example programs if you're not sure about this.

You use *Draw_Stroke* to draw a path on to the screen, and to draw the path stored at *path%* on the screen without using a transformation matrix – the path coordinates must be in internal



● *There are many options available when drawing*

draw units – use:

```
SYS "Draw_Stroke",path%,0,0,0,0,0,0
```

The six zeros tell the Draw module to use default settings for these parameters – I'll cover them later. To fill a path (draw it so that it's solid) use:

```
SYS "Draw_Fill",path%,0,0,0
```

Again, the zeros signify default parameters. If you want to draw a filled path with a different colour line around it, you will need to use *Draw_Fill* in one colour, change the colour and then use *Draw_Stroke*.

## Advanced drawing

The Draw module can do more than just producing a thin line around the outline of a path and filling it in. If you've used the Draw application, you'll have seen how you can change the thickness of the line, specify how lines are to be joined, add arrow heads on the end of lines and even use dashed lines.

You'll not be surprised to learn that the Draw module does it all. The full form of the Draw_Stroke SWI is:

```
SYS "Draw_Stroke",path%,fill_style%,
transform%,flatness%,line_thickness%,c
ap_join%,dash%
```

As in the first example of this call, all parameters except for *path%* can be set to zero to tell the Draw module to use the defaults.

You'll notice that this call takes a fill style. This does not mean it will fill the path as well – it specifies how thick lines are filled – the Draw module turns thick lines into filled shapes – I suggest you leave it as zero, the options it allows are rather esoteric.

The other items are:

*transform%* A pointer to a transformation matrix as described above.

*flatness%* A measure of how flat curves are. The smaller the value, the closer the lines drawn will follow the curve, and the less jagged the curve will look on screen, Example3 shows this. When stroking on to the screen, I suggest you let the Draw module choose a suitable value by setting this to zero.

*line_thickness%* Thickness of the lines specified in user units. The line is centered on the edge of the path. If it is zero, the line is drawn one pixel thick.

*cap_join%* A pointer to a four word block – see Table III for its format. It must be passed if *line_thickness%* is anything other than zero.

*dash%* A pointer to a dash pattern. See Table IV for its format. If you leave it as zero, continuous lines are drawn.

The *Draw_Fill* SWI is much simpler than Draw_Stroke, and only takes four parameters:

```
SYS "Draw_Fill",path%,fill_style%,t
ransform%,flatness%
```

The parameters are all explained above in the description of the *Draw_Stroke* SWI. As before, I suggest you leave *fill_style%* as zero.

The MegaDisk contains some examples of the use of the draw module. Example1 and Example2 have already been discussed. Example3 shows some different path styles, and Example4 demonstrates some more advanced uses of the draw module.

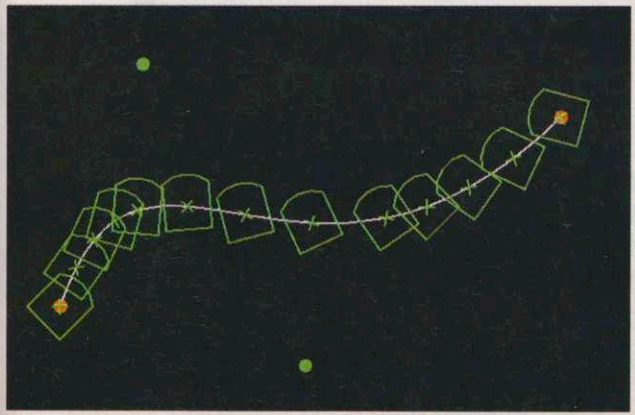
The Draw module can do lots of other clever things, but unfortunately there isn't room to describe them all here. You'll just have to read about them in the PRM.

### Table IV: Dash pattern format

The dash pattern is a list of lengths in user coordinates. Whether the line is drawn for that length alternates on and off, starting with draw on – the first element is how long the first dash should be, the second how long the gap before the next is, and third the length of the second dash, and so on. The pattern is repeated as many times as is necessary to complete the path.

The dash pattern has a small header before the elements. The format of the dash block is

| Word offset | Description |
|---|---|
| 0 | Distance into dash pattern to start |
| 4 | Number of elements following |
| 8... | Elements, each one word |



● *Move the points to change the curve*

### Using ColourTrans

ColourTrans provides a level of abstraction from the video hardware in your machine. You tell it what colour you want, using 24-bit colour values, and ColourTrans selects the closest colour currently available. If necessary, ColourTrans will dither two colours together to get a better match.

The ColourTrans equivalent to the Basic GCOL command is:

```
SYS "ColourTrans_SetGCOL",colour%,,
,flags%,action%
```

where *colour%* is the 24-bit colour, specified in the form &BBGGRR00 (blue * 16777216 + green * 65536 + red * 256, with each colour intensity ranging from 0 to 255), *flags%* should be zero, but add 128 if you want to set the background colour, and 256 if you want ColourTrans to use dithering. *action%* is the GCOL action as in the Basic command.

Obviously it's best to use this command instead of GCOL even in Basic programs, because it ensures compatibility with all types of hardware.

# REPTILES

## Escher's reptiles explored by Jim Paterson

**MAURITS C. ESCHER is the Dutch graphic artist famous for his puzzling pictures of impossible objects. Most people are familiar with his pair of hands drawing each other, the waterfall that flows back on itself, the set of continuously ascending and descending stairs or other drawings with wonderfully strange perspectives.**

Another source of endless fascination for Escher was the concept of dividing up an area into a set of tiles or shapes. Unlike the Islamic designs that inspired him, Escher's tiles would rarely be regular geometric shapes but animals, birds, fish, people or weird fantastical creatures of the imagination, often displaying his wonderful sense of humour.

Escher was able to combine these two themes in some of his drawings, like the man who runs downstairs and seems to end up merging with the background. Another example is Reptiles which is the basis for this program.

The original picture consists of a still-life of various objects scattered on and around a drawing pad. Sketched on the pad is an Escher tiling of reptiles based on a hexagonal grid pattern. However, from this two dimensional sketch seems to emerge a real solid reptile which appears to get up, wander around and over the objects, and give a brief snort in the air before returning to the sketch from which it began. The final irony is that the whole picture is of course flat including the apparently 3D reptile.

### Make your own reptiles

When you run the program a simplified version of the sketch on the drawing pad is displayed on the screen and in addition a drawfile version will be saved to the default directory. Using this you can print out at a higher resolution than is possible on a monitor.

The program uses the Draw module to render paths on screen and create the file. A list of data statements determine the shape of a single reptile and these are interpreted based on the initial keyword of each data statement.

The size of the reptile and its starting angle in degrees is controlled by the *parms* line. A size range of 1000 to 2000 is reasonable if you want the pattern to be periodic and a drawfile that is not too large, though this recommended range can be exceeded with a little care. The angle will normally be anything from 0 to 360 degrees.

The *page* can be anything from A5 to A0 followed by P for Portrait or L for Landscape, but in most cases A4 or A5 will produce a file of manageable size – A3 printers or larger are not particularly common anyway.

*Start* initiates a path and gives the colours for the three different orientations of reptile. A path with -1 is not filled, a path with 8 is filled with black (like the eyes, for example). Any number from 0 to 7 results in a pale pastel version of the normal default colours for 16 colour modes.

This is so that when printed on mono

● *Chasing their tails*

printers they will not produce large areas of dense ink or toner but nicely balanced dithering patterns.

*Move*, *line* and *curve* statements constitute the path and should be self-explanatory. The coordinates of the points are given as though drawn on isometric (triangular) paper. All such paths are drawn in black for emphasis. Finally a *closed* or *open* statement finishes the current path in the appropriate manner.

The first path constitutes the basic creature's outline which is made only of straight line segments for simplicity, this main body being filled with the appropriate colour while the second path adds the various interior details on top.

The third and fourth paths create the eyes which default to being filled in black for maximum contrast. These four paths are then formed into a single draw group which is a complete animal. Paths for three basic reptiles in different colours and orientations are constructed with their heads meeting at a single point. PROCcreate_ image first sets up the header information for the drawfile and then calls PROCreptile to modify this data, repeating the group of three reptiles at the correct positions so that they fit perfectly together.

This repetition is then carried out until a page of the appropriate size has been covered. This means that some reptiles will in fact go over the edge of the page, but these will not be noticed as printing will truncate them. PROCreptile also draws the images on the screen. If a path has a defined fill colour, Draw_Fill is first called to colour the interior of the path. Whether filled or not, Draw_Stroke is then used to outline each path in black.

A more detailed description of how to use the Draw module is given in the article starting on Page 55.

## What next?

Apart from choosing the desired parameters there is little to do except sit back, watch and wait for the file creation to complete.

Note that the picture on screen is not scaled to show the whole page, it simply shows the bottom left-hand rectangle (roughly A5) of the finished page.

The chosen colours will only show in a 256 colour mode such as Mode 15 or Mode 21 if you have a multi-sync monitor.

Having created a drawfile, there are many things that can then be done with it, rather than just printing it out and sticking the picture up on the wall. You might for example grab a screen image and turn it into a sprite or Paint file using *SCREENSAVE. It can then be used as a desktop background with RISC OS 3 or the corresponding public domain utility for RISC OS 2.

Drawfiles are also readily manipulated using any DTP program. You might wonder if it is possible to re-create the original Escher Picture which if you remember has many other objects with *live* reptiles crawling over them.

Well I did make an attempt at this which you can see below. It involved squashing the pattern to appear at an angle and overlaying this with the hexagonal grid. The result was masked to truncate it to the right size and then the notepad drawn.

I gave up on the task when it came to drawing the walking reptiles – perhaps someone with more artistic talent can complete this job.

● *Esher's original picture rendered in Draw*

NEXT MONTH

## WHAT'S COMING IN THE NEXT ISSUE OF *ACORN COMPUTING*

THE April issue of *Acorn Computing* will be in the shops on 5 April and the MegaDisk will be as packed full of exciting quality applications, games and utilities as we can make it.

- **SIMON THE SORCERER** – the long-awaited adventure game should be making its appearance in an exclusive demonstration form.
- **PLOT** – Clares powerful graphics presentation program for you to test
- Plus much much more, including the programs from the magazine and the best Public Domain utilities around

### Peer to peer

We check out Acorn's amazing new network software for small groups of machines allowing direct communication, and its application in schools

### Regulars

In addition to the best informed views, comprehensive coverage of new education products and the latest in art and music products, next month's *Acorn Computing* includes:

- Problem Solved: Get those computer difficulties handled fast
- TechForum: The ins and outs as well as the whys and wherefores
- News: The latest and the greatest up to date and in print just for you
- Databay: Hints and tips for the game player

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Acorn COMPUTING

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# Hopping mad

## Teri Paul explores more of the useful and interesting software in the world of PD

**I HAVE been a little remiss on the coverage of 8-bit PD over the last few months, as some of you have told me. However, there are a great many articles, utilities, games and resources ready to be exploited.**

All it needs from you is a stamped addressed envelope. So let's see what's going on without any other further ado.

### 8-bit crazy

The consistent quality of presentation of some of the PD libraries never ceases to amaze me, never mind the actual content. First call goes to 8-bit Software with some gems of programs:

- Memory Editor – Displays the contents of memory and allows editing by hex or ascii input.
- Romdump – Lists the roms in your machine, with the option to read and save each one.
- Ascii File Splitter – As you'd assume it cuts large text files into editable chunks.
- WordWise Utilities – BBC B-only for a change, with short programs such as a screen saver, and three tiers of programmable function keys, among others. I particularly liked the WordWise+ date stamp which comes with a utility to produce numbered line rulers.
- Master Function Keys – Master-only with the ability to save the definitions of F0 to F10 to disk and use *EXEC to reload.
- WordWrap – Wraps your text in a range of column widths, useful for designing text windows for printing, or graphic screens.

On the entertainment front, I particularly liked the TV Catchphrase play-a-like Phrases and the curious Shopping. Phrases gives you three puzzles per screen, either as a collection of words or just characters which translate into phrases, like Between the lines, Green with envy and so on.

Shopping has you gambling your way around the supermarket. Well actually, you are parked at a meter with only so much time to do your shopping and get back before the meter maid gives you a ticket.

As you fly around with a tricky trolly you can choose whether to gamble on luck. However, you may fail and get stuck with a trainee checkout assistant or an unpriced bag of sugar...

Relatively new to the 8-bit scene is Destroyed Realities, but their disk-based offering of games, utilities and articles only costs £1.80 – for further information send an SAE to David Lowless, 82 Main Street, Pembroke, Dyfed, Wales SA71 4HH.

Their latest issue contained two programs I found particularly useful. CMOSRam saves your configuration, whatever the reason for it getting messed up in the first place, while the copying utility, for copying 40-track disks on to the BBC Master, reads the entire disk into all the available memory – sideways and shadow ram as well as conventional memory – saving significantly on the number of disk swaps.

From Remuera, New Zealand, comes Andrew Lindsay with a solution for 32-bit people with too many fonts. Okay so you can't have too many, but can you remember what you used when, for what, and how it looked?

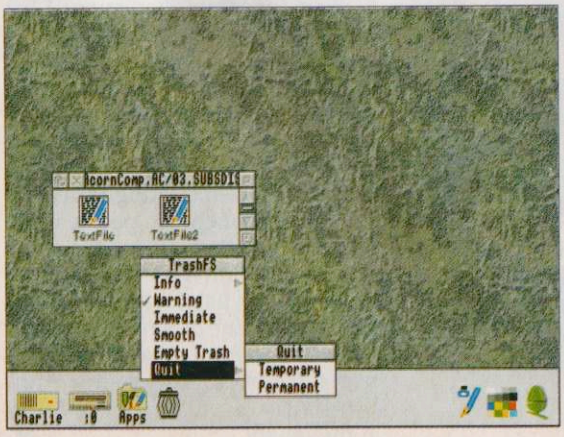
Yes, it time for a bit of organisation again. A wise man once said the universe started with order and then went into chaos – he'd obviously seen my hard disk...

### Fontastic

Font Manager is in version 2.55 and lets you group fonts into manageable lists which can be turned on or off as the whim takes you. If a group is turned on, its fonts appear in an application's font list, and if you change the available fonts while applications are polling the wimp, they detect the change and make the necessary changes to their font lists.

Simple and friendly to use, you don't have to create a partition to produce groups of fonts, and Font Manager is an improvement on the standard !Fonts. Incidentally, I'd recommend you keep a copy of !Fonts on floppy for security whether you are running Font Manager from floppy or hard disk.

Font Manager's main window splits into two the folders of fonts ➤




● *Trashcan gives you control over your rubbish*

**Featured this month**

| Program | Library |
|---|---|
| Font Manager 2.55 | Subscriber's disk |
| StickyBoard | APDL, Gem, DataFile, Craig Beech |
| TrashCan | APDL, Gem, DataFile, Craig Beech |
| SamplePlayer | Subscriber's disk |
| Compress | Subscriber's disk |

## PD LIBRARIES

### 8-BIT HOUSES

8-bit Software, 17 Lambert Park Road, Hedon, Hull, East Yorkshire HU12 8HF.
BBC PD, 18 Carlton Close, Blackrod, Bolton BL6 5DL.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
JJF PD, 49 Hollyberry Close, Winyates Green, Redditch, Worcester B98 0QT.
Mad Rabbit PD, PO Box 4, Crigglestone, Wakefield, West Yorkshire WF4 3XE.
Masterdisc, 2 Seaview, Hoylake L47 2DD.
Welsh Boys PD, 88 Queen Street, Barry, South Glamorgan CF62 7EE.

### 32-BIT HOUSES

3PD Swapshop, 66e Picardy Road, Belvedere Kent DA17 5QN.
Alpine PD, PO Box 25, Portadown, Craigavon BT63 5UT.
APDL, 39 Knighton Park Road, Sydenham, London SE26 5RN.
Arcaynia, PO Box 1927, Sutton Coldfield B74 3QZ.
ArchAngel PD, PO Box 41, Exeter, Devon EX4 3EN.
Archimedes Fractal Group (AFG), 30 Bowen Drive, West Dulwich, London SE21 8PN.
ARM PD, 109 Woodland Drive, Cassiobury, Watford WD1 3DA.
ARMistic PDSL, 136 Wellesley Road, Ilford, Essex IG1 4LJ.
Craig Beech PD, 30 The Deerings, Harpenden, Herts AL5 2PE.
Datafile, 71 Anson Road, Locking, Weston-Super-Mare, Avon BS24 7DQ.
Datastream, 34 Norbreck Close, Great Sankey, Warrington, Cheshire WA5 2SX.
Different Ideas, Eyton House, Eyton, Leominster, Herefordshire HR6 0AG.
Digital Phenomena, 104 Manners Road, Southsea, Portsmouth, Hampshire PO4 0BG.
DigiTech, 20 Downing Crescent, Bottesford, Scunthorpe, South Humberside DN16 3LS.
Eureka PD, 78 Rawlinson Road, Southport, Merseyside PR9 9NE.
Gem PD, 15 Partridge Down, Oliver's Battery, Winchester, Hampshire SO22 4HL.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
LowCost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.
Moonlight Graphics, PO Box 3569, Cape Town 8000, South Africa.
Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.
Planet PD, 37 Manor Drive, Berrylands, Surbiton, Surrey KT5 8NF.
Skyfall, PO Box 2220, Birmingham B43 5RZ.
Swop It PD, 7 Salterns Terrace, Bideford EX39 4AG.
The Chroma Project, 153 Holt Road, Fakenham, Norfolk NR21 8JF.
Westbourne Services, 34 Bradley Street, Wooton-under-Edge, Gloucester GL12 7AR.

➤

and the fonts themselves. The passive ones are greyed out. To add a font drop it into the fonts side of the window from where you can move fonts between folders, create new folders or delete unused ones.

You can also alter passive folders and force the changes to take effect through the menu. Intuitive and extremely useful. Recommended.

## Trash it

Prolific David J. Seery has updated his sticky backdrop !StickyBoard to version 0.81, which includes some new features – scaled backdrops, tidy and organise options, fish, multiple selection drags, grid lock, alter background colour, transparent text plus other tweaks.

There have also been some bug fixes since the review in the Special issue of *Acorn Computing*, such as the one where sprites larger than 32k can't be loaded as wallpaper.

As we are the subject of backdrops, any Apple Mac exiles will have at sometime bemoaned the lack of the dustbin (or trashcan to the more transatlantic of you).

There are a number of these available in the PD and you send your disk and take your choice. Mr Seery has a new addition which is a module with a * command interface from the CLI, type *Help TrashFS from the F12 * prompt.

Then all you have to do is drag files to the iconbar to bin them. You can access the trashcan by clicking Select over the icon, and Adjust closes it. The position of the trashcan can be altered by changing the variable TrashFS$TrashDir in the !Run file.

Shift-dragging files out of the trashcan enables them to act just like normal filer windows. If you are about to delete your entire *rubbish* watch out for the warning as the border changes colour to red.

I'd have preferred a message window myself. But, if you are ultra-confident, you can even turn off this colour-coded warning.

The Smooth option toggles the trashcan animation from thin to fat, while Immediate deletes files dragged to the icon instead of storing them in the trashcan.

When you've had enough, a Temporary quit removes the icon until the next reset, with Permanent removes it from memory completely.

My thanks to William Cooke for a variety of programs, including a selection of samples from Monty Python, which I have added to my hard disk next to the Star Trek original and Next Gen files. These can be played individually, or as a sequence, courtesy of David Radford's excellent Sample Player. What do you mean you haven't got a copy?

Samples are probably the most under-used resource on the Acorn machines, especially considering just how inexpensive OakRecorder is. Demo writers seem to have discovered them but that's it.

## Super sampling

The capabilities of SoundFXMaker, and the facilities of the sample editors like Armadeus and AudioWorks, are really excellent. Uses go far beyond entertainment.

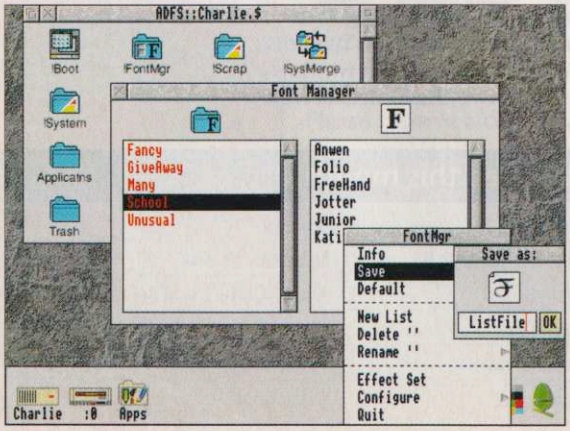
However, one major reason for the lack of use is the sheer amount of disk space these samples take up. The answer, of course, is to compress them, especially when you consider that a good sample (20.833Khz) takes up about 20k for each second.

Sample Player assumes that you have compiled your samples – your own or from PD libraries. These should be compressed by a separate program called !Compress, also by David Radford.

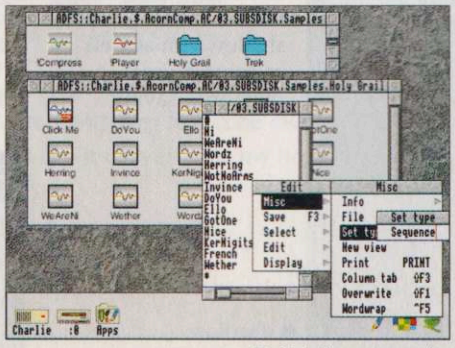
As you load Sample Player it decompresses the samples so that any compressed sample can now be played by double clicking. This is mostly invisible to the user, but the file icon for compressed samples has an orange horizontal line as opposed to a red one.

The fun starts when you decide to put your compressed samples into a sequence. To do so you create a text file – type &351 (Sequence). This works well when creating/recreating conversations between people using sampled phrases.

Full information on this is given in the on-line help, but remember, when taking the original samples you don't want to mix compressed samples with different sample rates. Experiment, you'll be surprised at the results.




● *Making fonts accessible*




● *Get those samples in sequence*

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| YOUNG | Raven | Bolt | Buckingham | Swizz | |
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| Citric | Cybernoid | Oxford | Amber | Baskerville | |
| | | Reiner | Garden | | |

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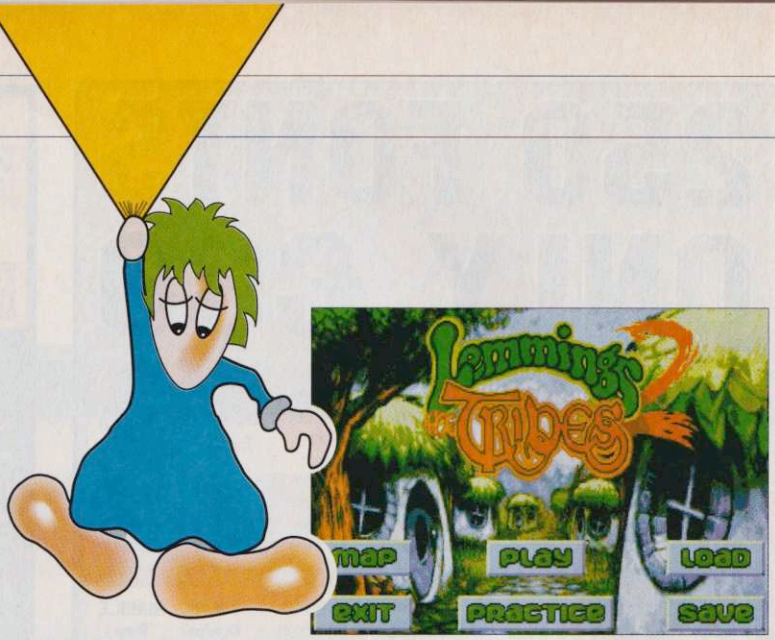
# Lemmings 2 "The Tribes"

## ...chip off the old block




● *Complete control*

I'VE always liked Lemmings and rescuing them from their own mindlessness, and I'd heard that this version was better, in some ways, than the original – but how? Well, now I know.

The Tribes have the same basic concept – you must rescue the marching Lemmings by guiding them to the exit, and obstacles are overcome by giving individual Lemmings certain skills, such as digging or climbing.

However, the first big difference is that The Tribes has a plot – the 12 tribes of Lemmings, each of which has a piece of the medallion, must be guided to the centre of their island so that they can all reunite and escape.

There are 60 Lemmings making the journey in each tribe and you start each new level with the number that make it through the previous one. This brings us to another point – so far I am certain that it's always possible to get every Lemming through each level (because up to now, I have managed it).

Each of the 12 tribes has a particular type of scenario, and they are: Beach, Outdoors (camping), Shadow, Egyptian, Highland, Sport, Space, Arctic, Circus, Cavelem, Medieval and Classic.

And into these come the 60-odd skills – rather than the original eight. Of course you don't have all 60 on each level, you have up to eight, although there's always a fair smattering of red herrings, unlike the original where you're always given a minimal number of skills once you're past the basic training screens.

Some skills are duplicates, such as swimming, kayaking and surf-boarding, which all allow a Lemming to survive in water – at least until they reach the other side.

Other skills are scenario-specific, such as ice-skating for the Arctic, throwing in the Highlands and magno-boots for Space. But all the skills add humour, which was a feature of the original and carried through in this one.

As with the original, one of the basic premises to finishing a level is to split off a single Lemming from the group and get him to build or dig his way through, and around, obstacles.

This version carries the principle through, but with additional skills to help separate the advanced Lemming – jumping is one of the most useful, as is running.

An addition to the original climber is the cliffhanger, who will hang momentarily on an overhang to give you a moment to switch to the shimmier which moves along the overhang.

Another aid to stopping Lemmings is the musician. When he plays, all the Lemmings in the area stop and start to dance, except they don't stop instantly. It's random and sometimes one might not stop at all ... then it's back to the start unless you can handle it.

Depending on the scenario each musician plays a different instrument and the Lemmings dance differently. This also goes for the exit which varies with each tribe, and the way the Lemmings actually perform their exit also alters.

For example on the Medieval set they raise a sword before walking out, while the Cavelems fall to their knees and bow.

There's a lot to see and the graphics are even better than the original. The sound is also excellent but can be turned down or off if you want. There's a brilliant introductory sequence that explains the plot, but as this is a separate program you don't have to run it.

The gameplay is even more addictive than before, with the added bonus that if you get stuck on a level you can change to another scenario and have a go at that one. The map deserves a mention at this point, it represents Lemming Island, divided into its 12 segments.

When you first switch to the map the pieces of the medallion are around the outside, but they immediately start to move to the centre.

How far they get depends on how many levels you've done. I've completed all the Shadow so the piece goes all the way to the centre – but you can still play levels you've already done if you want to try to do better. When you complete a scenario there's a short sequence where the medallion piece is slotted into position.

You can, of course, save your position and there are 10 saved games allowed at one time. This game is superb, addictive and will give hours of pleasure, so is certainly worth the price. Brilliant.

**Steve Turnbull**

● *Practice is recommended*

## PRODUCT SPOTLIGHT

*Price: £29.99*
*Supplier: Krisalis, Teque House, Masons Yard, Downs Row, Moorgate, Rotherham S60 2HD.*
*Tel: 0709 372290*
*Requirements: 2Mb ram*

● *As you succeed the fragments move toward the centre*

● *The more Lemmings survive, the more chance you have*

# Birds of War

## ...top guns

FOR some reason, software companies seem to have decided that people want big games, compressed on to lots of disks. Coming on seven disks, Birds of War – a *huge* flight simulator – is the latest offering from The Fourth Dimension and shows that the Acorn market has been tempted to follow suit.

Birds of War is quite an innovative flight sim – if that's not a contradiction in terms. Instead of just settling down to fly and fight in a plane of the *programmer's* choice, *you* are given the option of when, where and in what you fly.

As well as this, you can choose the armaments your plane carries and even how easy or difficult it is to play.

The game is divided into four eras, the 1920s, 1945, 1960s and the modern day. Your pilot may only exist in one of these periods and the choice will determine what planes and armaments are available – no one would expect a Sopwith Camel armed with Mavericks and laser guided air-to-grounds (could be fun though).

Once the era is chosen, you will be offered a choice of six campaigns. These vary in difficulty and take place in different parts of the world, which obviously affects the sort of weather you'll be facing. In each campaign, you'll be set eight missions by your commanding officer, which – depending on how you carry them out – will be deemed either a success or failure. This makes a total of 192 missions.

Once all have been successfully completed, you go on to choose a further campaign with yet another eight missions. Even the most avid enthusiast is likely to be kept busy for a couple of months on this game.

As well as longevity, the entire game is liberally sprayed with polish – a refreshing change from some of the earlier flight sims.

The graphics are very good, with concave objects drawn correctly and mountains and clouds that actually fade into the distance. Added to this is the ability to choose a variety of views, including orbital cameras and tactical or fly-with-the-missile views.

Of course, all this requires a fairly meaty processor and for those of us with ARM2s, the detail level can be adjusted to keep the speed up.

On the subject of speed, a major complaint of these games is the inactivity while flying long distances. BoW, however, addresses this by providing excellent fast-forward facilities that literally makes time fly.

The out-of-game interface is also very good. Based on similar ideas in PC games, the system is very intuitive – if you want change your plane, you simply click on the hanger door. Similarly, if you wish to find out about your missions, enter the briefing room.

However, despite all the good looks, well-travelled flight simulator addicts will find the game severely lacking in one respect – there is no support for a joystick. Some people, including myself, prefer to use the mouse or keyboard, but for a flight sim the lack of a joystick is quite a severe limitation.

The only other pitfall is that because of the number of disks the game occupies, hard disk installation is effectively a necessity. Unless you are willing to stick to one era and can use high density disks, there will be a large amount of disk swapping for the floppy-based player.

Despite these two down points, BoW has to be one of the best flight simulators around for the Acorn machines. Its high quality and wealth of controllable options give Acorns a game worthy of their ability.

**Paul Mason**

● *Ready for take-off*

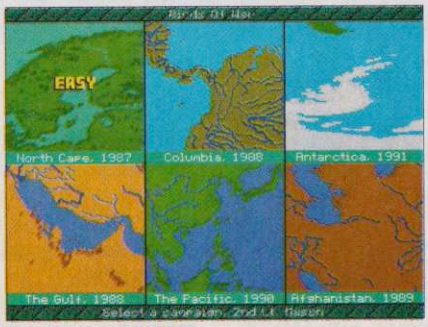
● *Planning your attack*

## PRODUCT SPOTLIGHT

*Price: £34.95*
*Supplier: The Fourth Dimension, 1 Percy Street, Sheffield S3 8AU.*
*Tel: 0742 769950*

● *Will you go with the old...*

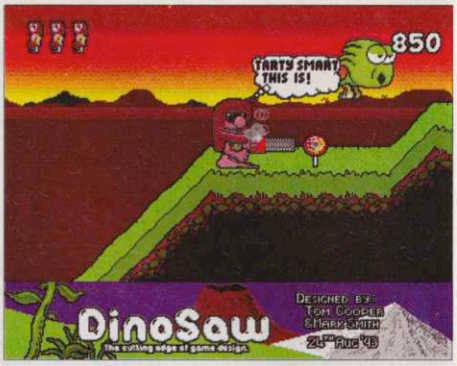
● *The choice is yours*



● *...or the new?*

# Dinosaw

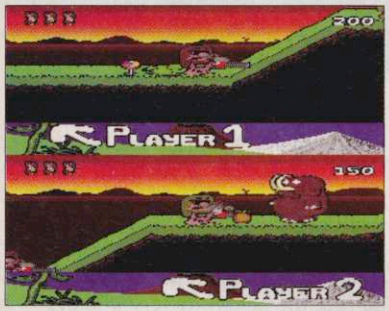
## ...jurassic lark




● *One-player action...*

BUYING a game is often a hard decision. There is nothing worse than after spending £30 or so the latest game is condemned to the *Eldorado* pile after half an hour. Dinosaw is a *very* low-priced, Chuck Rock-style platformer from Tom Cooper of 2067BC fame.

After a quick bit of advertising for one of his other games, you are ready to play. You take the controls of a bad-tempered caveman armed with that classic prehistoric weapon – the common or garden chainsaw.




● *...or twice as much fun*

This game is not for the faint-hearted as you literally plough your way through enemies, consisting mainly of dinosaurs. Quite often, especially in later levels, the puzzles require a little thought and deft keyboard control to avoid deadly pterodactyls and woolly mammoths.

Probably the best part of the game is the two-player option. In a similar style to Sonic the Hedgehog, both players are active simultaneously, with a split-screen providing each player with a view of their surroundings.

Because both players generally work together, it means that with this option, you can often get further in the game. Spread over 15 levels, it takes a long time to run, cut and jump your way to the end.

Admittedly, this game doesn't offer anything new – except the two player option – but a good splattering of humour makes it most enjoyable even to a platform enthusiast. Reasonable graphics, fun gameplay plus the low memory and disk requirements all add to its appeal. For those without Chuck Rock or 2067BC, Dinosaw is *well* worth its price.

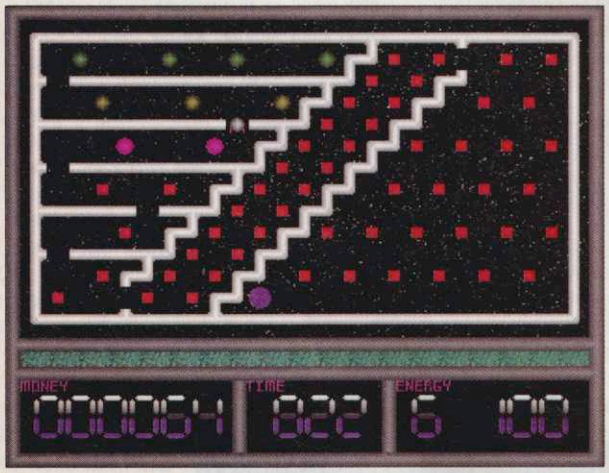
**Paul Mason**

### PRODUCT SPOTLIGHT

*Price: £5*
*Supplier: Tom Cooper, 29 Woodland Ravine, Scarborough, North Yorkshire Y012 6TA.*

# The Nemesis

## ...trading mazes




● *Okay, get out of this one without losing any energy*

THIS is another budget offering which is nicely put together and at first glance looks like an Elite clone. You know, you have some money, must trade for more so you can get a better ship and so better cargo ad infinitum. Okay I know that there is more to Elite than that, but the genre doesn't grab me, heretic that I am.

However, that basic premise is all The Nemesis has in common with Elite. As rather than guide a ship through the stars you are guiding a small blob, with enhanceable characteristics, through a range of different mazes.

Your energy can be depleted by the red blocks which you must manoeuvre around and the items you collect will increase your wad, as will selling what you have brought to the planet.

Now moving around the maze can be a little tricky as the controls are sensitive, but as with most new vehicles you soon learn their eccentricities.

There are 20 mission and 15 planets which you journey through in order. Be warned though, some equipment for your ship works, some is totally useless while other bits, for instance, are needed to transport certain types of cargo. Most useful is the chance to buy time – if only that could be made to work in the real world!

When a mission is completed it's saved to disk so you don't have to play it again – you can't try a higher mission until you have completed the previous one. You can go back to earlier ones though. Back up the disk before you play.

The Nemesis isn't a major release, but David Law has made a good job of it and has an eye for putting together a game which combines the elements of good presentation, instant appeal and that elusive certain something – gameplay.

**Teri Paul**

### PRODUCT SPOTLIGHT

*Price: £10 (£15 if you buy with Dungeons of the Beast)*
*Supplier: SyncSoft, 24 Woodbourne Road, Brooklands, Sale, Cheshire M33 3SY.*

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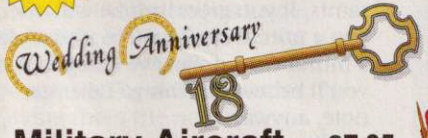


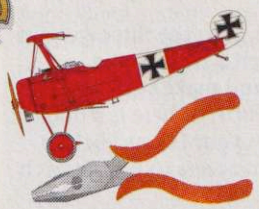

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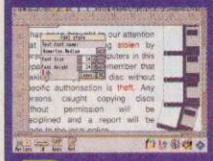

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# Tuna salad

**LAST time I did my best to explain the inexplicable in Magnetic Scrolls' Fish – so far as the Dark Warp was concerned – and to give an example of solving this non-maze puzzle.**

To recap: If you do not have an odd number of exits, take a vertical to start with – or produce one by taking the first available exit – and once you have an odd number, eliminate the diagonals, take all other non-vertical exits and finally go UP. If that hasn't done it, one of us has gone wrong, but I don't think it's me.

It's time now to pick up things you dropped in Dr. Roach's apartment. Mobility and money are essential, so get the *fisa* card, the travel pass and your identity card, as well as the card that lets you into forbidden areas of the university.

Now add the crystal, the bag, the radio case and the screwdriver to your collection, go to Paddington station, and catch a train to Battersea. Leave the underground station, go north to the power station and endure the tour. At the end, you'll be faced with a switch and a steel door. Pulling the switch will open the door which lies to the west – so off you go.

Please note, the pressure door will only open if you have remembered to turn off the lights in Dr. Roach's apartment and to turn off the protocopier once you have used it. How do I know? Guess which one I forgot.

With the pressure door open, you can now move west into the tunnel containing the turbine. A further move west brings you face to face with some grilles. There's a filter here, which you need, so unscrew it with your screwdriver. Don't hang around here otherwise the turbine will start and it's minced Roach for tea. Save your status after you've opened the door.

Once you have the filter, get out quickly, catch a train to the University and make your way to the foyer. North of here is a door which needs your ID card before you can gain access to the research wing.

There is a crystal tuna in here and you need to put the crystal you are carrying into the tuna so that you can tune it – *I didn't make up the puns, I just have to live with them.* The procedure involves closing the tuna, switching it on, opening the tuna again and then taking the crystal.

Now move up into the tower – only half full of water – where you can just make out a trap door far above you. It's time to become a flying fish. Filling the bag from the cylinder allows you to float up through the trap door to the roof.

Here you will see a photon bridge – another essential ingredient – so drop the bag and the cylinder. This will enable you to grab the bridge while the bag floats away into the air.

With your last breath make your way to the railings and drop back into the water – a move which will land you back in the quadrangle. Move east from here until you hit the laboratory door. Put your ID in the slot, go inside, drop the bridge together with the tuned crystal to join the focus wheel, and then make your way back to the station. To be concluded...

## Opening gambit

The Pawn is a lowly piece, a sacrificial lamb usually doomed to slaughter. We can't aspire to knighthood – or even a bishopric – what we can hope for is mere survival. Let's go for that, shall we?

One move east from your starting position involves a confrontation with the time lord-magician Kronos, who uses a mode of locomotion usually attributed to the Celtic saints. If you greet him he will offer you a note and ask you to undertake a minor errand. Believe that and you'll believe anything. Take the note, anyway.

You will, I trust, remember from last time that you have acquired a thick silver wristband. The sensible thing to do is ask Kronos about it.

You will now be given a slightly harder task: You must kill the man who rides the legless horse (never heard of a boozed-up equine before?) and transport the body to Kronos' room in the northern mountains. Feel fit? Good, we might survive.

Kronos also offers you a chest which will explode when opened. The idea is that you give it to the chap due for assassination and hope for the best. Do you believe all this? If you do, you've never played a Magnetic Scrolls adventure before. Take the chest anyway: Who knows?

Three moves east will take you to the palace gardens, a place of manicured lawns and herbaceous borders. Funny thing is, though, apart from the toolshed, there's a mat lying here. Go on, have a peep underneath. While you are at it, if you have not obeyed my golden

rule, check your inventory and then have a peep in your pocket. We now have two keys – one wooden and one metal.

The funny thing is that the key under the mat won't help you into the shed: The metal key will, though. Make sure you include the word *door* in your input here. Now you can open the toolshed door and step inside.

Your aim now is to become a gardener, so examine the workbench carefully. You will find a trowel which you should take, but notice also that the bench is described as standing about a metre off the ground. This is a good hint that a peep underneath won't go amiss

You will discover an empty – of compost, anyway – pot and a plant. Funnily enough, the plant resembles the design emblazoned on your T-shirt. Rum old world, innit?

Use the trowel to plant the plant in the pot properly. The plant will cheer up no end and you'll add five points to your score. Now take the rest of the gardening tools to complete your disguise and leave the shed.

Once outside the shed, one move east will take you to the palace gateway where you will be accosted by armed guards. Giving them the note will accomplish two things: You will learn that the king thinks Kronos is an *evil lizard*, and you'll get flung out on your neck. He seemed such a nice old man, too, didn't he?

Four moves west should find you back at your starting place, the location described as *On the path*, and one further move west puts you in the depths of the Rank Forest, from where a move north and then northwest puts you outside the hut of a Guru.

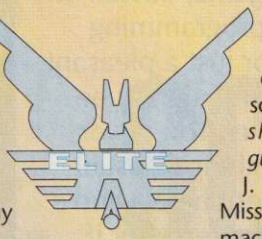
The thing you need to realise about Gurus – in the modern sense, anyway – is that they can be sensitive souls and sometimes need shielding from sights that others find undisturbing.

So the first time I popped in to see his guruship, I reduced him to helpless giggles and could get no sense whatsoever out of him. The trick is to cover up that wristband. Take your T-shirt off and use that.

The Guru will still be a bit flighty but at least this time he gives you something to do. You are presented with a bowl and told to fetch him the essential nourishment of all mortals. Do that, and he'll answer your questions. And that's it, for this time.

## Elite update

Derek Martin has a problem I've never come across before. He has an A5000, 4MB ram, 120Mb hard disk and RISC OS 3 running ArcElite Gold Edition. Every so often the machine hangs up completely for no apparent reason and he has to do a Control+Break reset. It means that frequent saves to disk are essential and irritating. Has anyone got any ideas?




Would the person who sent a letter on disk concerning Elite addressed to *Whomever wears the hat* like to try again. I rummaged around but the disk was blank. Paper is always safest, but if people want to send a disk, it's probably best as an ascii file.

C. Roberts from Worthing has hit trouble on Mission 1 in Elite. He's been to Reesdice and received the message that the fugitive had bought, and used, a Galactic Hyperspace drive. He did likewise but, on searching all the systems nearby, has failed to get a message. He's done the right thing, so I'm at a loss – unless he's overlooked one system.

David Imeson of Pinner has discovered something that evaded me in ArcElite, though. Commander Chronon has also just picked it up. If you buy a load of minerals at a Poor Agricultural system, jettison them in space and blast them with your laser your score mounts quite rapidly. Chronon says that each is worth 8 kill-points if used in this way.

David also recommends using the Jump facility very rapidly as a way of reducing your chances of missing an asteroid field – now a source of lotsa kill-points. He's Very Deadly and is anxious to know when to expect the Fourth Mission. Soon, my son, soon. Note, however, that with a bank balance of only Cr201,000 you are a relative pauper. Dosh is as important as kill-points.

Next he asks if craft blasted with an energy bomb count towards your score of kills. No, you may have saved your skin but you haven't improved your reputation. He also wonders if Space Dredgers and Generation Ships can be found on the old versions of Elite. Well, I never did, not even when running it with my 6502 Second Processor.

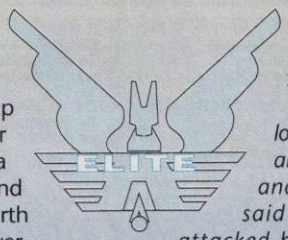
Lastly, he's encountered the same sort of problem as Derek Martin. David has an unexpanded A3010 and has noticed that the hang-up only occurs in flight, especially when Missionaries are on the scene. He ends disconsolately, *I cannot even shoot the Missionaries as this almost guarantees a crash.*

J. Mansfield is longing to discover the first Mission in Elite – he doesn't actually say which machine he has – and wants help in starting it. The only advice I can give is this. Kill as many baddies as you can, make as much money as you can and (if it's ArcElite) stay in Galaxy One, and one fine day it will turn up.

I can't emphasise too much that Elite, in all its versions, is a game which rewards dogged perseverance as well as skill. It's also why, when it was converted to some other machines, they made it easier. There are a lot of wimps out there.

Commander Johnston has some advice for traders who want to trade in precious metals and gems. Buy gold at or below 38, for platinum it's 69.2 and gems the key figure is 18.8 credits. He's also experienced the dreaded hang-up on an A5000 with RISC OS 3.1. He's quite a lad, too – an Elite Fugitive with Cr700,000 to his name.

Commander C. Jones reports an oddity on his version of Elite while on Mission One. He was at Reveve, hyperspacing to Arorar when he was dumped into Witch Space.




He continues, *The disk loaded me to Arorar, stopped and loaded again. My short and long range charts both said I was at Arorar. I was attacked by what must have been about fifty ships – mostly Thargoids. Then I used my energy bomb, but more ships arrived. I then used my Escape Pod which took me back to Reveve.*

He wonders if – since he then hyperspaced to Arorar again but didn't land in Witch Space – this was a bug. Well Witch Space always was a randomly generated event, however the Arorar incident sounds distinctly odd. No doubt I shall have news of more oddities next time.

## Confession time

I've been a teensy weensie bit unfaithful over the past year. As well as cerebral adventure games, I also love a touch of slash 'n slay in Role Playing Games.

Ultima Underworld II is well worth looking out for, provided your Archimedes can emulate at least a 386 PC with a minimum of 2Mb ram and 14Mb of hard disk space. The auto-mapping facility is absolutely brilliant. Can someone convert it to the Arc, please?

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# Rippling screens

Mike Cook takes another selection of your queries to solve

**AGENDA**

- Supply decoupling
- Faulty power supply
- Dirty spade connectors
- BBC manuals
- What to buy

**Q** MY BBC A3000, which has a 4Mb Atomwide ram upgrade, has been giving me some trouble. When I use any applications, rippling lines move up or down the screen together with a buzz which is heard from the internal speakers. The frequency and intensity of these change as different operations are carried out or the mouse pointer is moved.

There also appears to be a very small amount of *residual* rippling which is unaffected for any tasks. I assume that the problem is caused by interference from the processor reaching the audio/graphics circuitry of my machine.

I found a similar problem mentioned in the June 1990 issue. Your advice was to solder a 100uF, 10V decoupling capacitor across pins 7 and n4 of IC68 on an A310. Could you advise me how to perform a similar modification to my machine or offer any alternative solutions?

Wondering whether or not the PSU might be faulty – the screen would also darken and jump when accessing a disk – I exchanged it for my old Beeb unit, joining all connection points in parallel. The effect persisted although the dire rippling was reduced.

I re-installed the A3000 PSU and the same lower level of rippling remained, so I resume that dirty power contacts – which have now been thoroughly cleaned – were adding to the problem.

The screen still darkens sometimes during disk access, is this normal? Is a faulty PSU likely to cause the *activity related* rippling and buzzing effect?

The next question concerns the Sony 14in portable TV I am using as a monitor via the SCART socket. I am unable to obtain a completely stable picture.

Sometimes there is a horizontal jitter in the display which seems to be caused by the TV partly locking on to sync pulses from its internal tuner, as well as those of the computer.

Finally where can I tap off the unfiltered audio output?

**Daniel Hope, Ramsgate, Kent**

**A** *The faults you described sound to me like you have an earthing or supply decoupling problem. The screen should not dim when there is disk access and if it does it could be due to the power supply not being able to provide the extra power.*

*However, this is unlikely and you have proved it yourself by substituting another supply. It is most unlikely that two supplies have the same fault.*

*Therefore, it seems probable that you might have a supply decoupling fault. Supply decoupling components make sure that changing current consumption in one part of the circuit does not affect the voltage in the other part.*

*Looking at the circuit of the A3000, I would certainly test the inductor L18. This is a 2.2 uH choke and could be causing you the problem. However, I would also be inclined to look for a problem with the earth return circuit – a high impedance path here could also cause the same symptoms.*

*This advice goes for the sound too, as the two circuits are very close together. Unfiltered sound is not much use, but if you want it you can get it from pin 1 for the left and pin 8 for the right of IC39 the LM324.*

*Your problems with your TV might be caused by the same poor earth return. Look at the sync signals on your oscilloscope and make sure they are healthy and stable. Again, horizontal jitter can be caused by poor earth returns. If it were a problem with sync break though, I would have expected it to be worse with the station tuned in and not with an untuned station.*

## Sounds faulty

**Q** MY BBC B has a start-up time of up to 10 minutes with the Caps and Shift Lock LEDs lighting weakly and then flashing full strength momentarily. The Caps Lock then lights fully and the monitor whines quietly but the normal screen only appears when I press Break.

I have removed the ram chip but with no effect. My sons say the problem started when the memory expansion was fitted. I don't think it occurred immediately and prefer to think that the fault lies with the PSU. However, I was under ➤

## Powering down

**Q** IN 1992 I added a Morley Electronics hard disk upgrade comprising of a 100Mb (Rodime) hard disk and a Morley cached SCSI interface podule to my A420/1 to replace the existing 20Mb ADFS hard drive. But problems soon became apparent.

When the computer is switched on the hard disk starts up and the boot file is run, but shortly afterwards the drive powers down then seconds later starts up again.

It's never yet happened when I've been saving, but it happened once when I was loading and I got a message like *Unexpected disconnection*.

Hitting the computer stops the problem from happening for the evening when I'm using it. I would be grateful if you could suggest where the bad connection might be.

**R.D. Currey, Cheltenham, Gloucestershire**

**A** *Intermittent connections are perhaps the worst faults to try and track down. This is because they have a habit of going away so they do not hang around long enough to be tracked down.*

*Now with a SCSI device you have a lot of connections to go at, but the fact that the drive motor turns off strongly indicates that it is the power supply that is failing. In this sort of upgrade the power is normally supplied by push-on spade connectors – the type used in many cars. In fact these were used on the first BBC Micros and sometimes caused trouble.*

*The solution is to first of all clean up the spade with a little fine grade sandpaper and a quick wipe with some sort of solvent like switch cleaner or IPA. Next, squeeze the clip up gently with pliers to ensure a tighter fit before refitting.*

*If the problem persists try to make sure it is the power by monitoring the voltage on the board. If it is, you could try soldering the spade connectors together – but only do this as a last resort.*

➤

the impression that solid state devices either lived or died and certainly didn't have to warm up like valves.

**A.D. Reynolds, Sudbrooke, Lincoln**

A *Your fault does sound like the power supply and it's not completely true that solid-state devices either live or die, although it is like that most of the time.*

*The power supply is a switched mode one. This works by sensing the voltage on the output and switching the mains on when it drops below the required output and off when it goes above.*

*The result is what we call a feedback loop. If any part of the loop fails the whole thing fails to work and so you can't use the normal fault finding techniques of tracing the voltages through the circuit.*

*It sounds like what is happening here is that a resistor has gone short circuit in the feedback system and is charging a capacitor too slowly, hence the power is being switched off before it reaches full voltage. Eventually this is being charged up and the feedback loop then works.*

*Now, mending a switched mode power supply is not a job for an amateur, and is a job that even professionals baulk at. I wouldn't tackle the work myself as you need specialist test equipment not found in the normal service workshop.*

*The capacitors in the supply can have several hundred volts on them and hold this charge for days after it has been unplugged – resulting in a nasty shock.*

*I found myself in a similar situation last month. The power supply in my optical drive went. The suppliers Optec were not very helpful as all they wanted to do was sell me an exchange power supply for £95 plus VAT.*

*In the end I found RW Electronics in Honiton (0404 84648). They specialise in mending power supplies from Acorn machines. They fixed my supply for £13 – a great improvement – and the unit was back in less than a week. I suspect that they can't always guarantee to be as low cost as this as it depends what components have gone and how long it takes to find them.*

You can write to Mike Cook c/o Acorn Computing, Europa House, Adlington Park, Macclesfield SK10 4NP.

He will answer any questions about difficulties you may be having with your machines, mainly those to do with hardware. If you want a personal reply ensure that you enclose an SAE with your letter.

## Manual access

Q WITH reference to T.H. Theakston's query concerning a User Manual for the BBC Master in your December issue, WeServe Computer Services have a Master 128k Welcome Guide ref BBMASWEL priced at £13.

They also have the Reference Manuals 1 and 2 at £14 each which are not essential unless you are a dedicated programmer. Part 1 is concerned with machine code with Part 2 being mainly about Basic.

WeServe also stock the New Advanced User Guide BBC B/Master at £19.95.

WeServe are at 4042 West Street, Portchester, Hants PO16 9UW. Tel: 0705 647000. They also have the Welcome Disk for the Master, plus two or three pages of suitable software in their current catalogue.

**Margaret Costello, Lee on the Solent, Hants**

A *Thanks for the information. It is always useful to know where to get such publications.*

## Horses for courses

Q I AM an IT teacher with a *user* understanding of many programs. I want to buy my own machine. Is an A5000 4Mb, 80Mb hard disk a sensible buy? The cost is around £1,200 and I also need a colour printer. Or should I go for the A4000?

My main use would be DTP to create worksheets, so I need the memory to work with clip-art. In addition, what would you recommend for a school fun computer club with about £100 to spend?

I've read a few issues of your magazine but it is often far too confusing for beginners even with my Maths degree.

**Ian Davies, Berlin, Germany**

A *The best advice to give someone wanting to buy a computer is to wait, as in a year or less there will be something better and cheaper. Unfortunately, this means that you'll never own one, as there will always be something new.*

*However, in my opinion there has been nothing radically new from Acorn for many years and we are long overdue for something special, so perhaps my advice has even more import at the moment.*

*Having said that, the A5000 at the moment represents quite good value for money and for your uses should fit the bill.*

*As to a printer it seems at the moment you have two choices, quality black and white in the guise of a laser printer or a colour ink jet. There have been great strides recently in ink jet technology, but I don't think the quality is quite good enough.*

*Letters are still a bit too ragged for my liking and the colours are not that good. I know that the colours on the demo sheets are quite good but they choose images that look right and minimise their limitation, as well as using very high quality paper – and you can't expect them to do anything else.*

*Therefore, I would choose a low cost laser printer. If you can't afford that go for a black and white ink jet.*

*If you are really serious about clip-art then I would strongly recommend getting a CD-rom drive as that is the only medium you can get a* useful *amount of clip art on.*

*Software for a computer club is a bit tricky, but here goes. As it is a club there is a limited time that any one person will spend in front of a machine. Modern games are designed for a single user to play for a long time. You get maximum value here when you* really *get into the game.*

*Therefore, with a limited budget I suggest that you go for a few of the excellent collections of older games from Superior Software and others. Alternatively you could try a game that will involve a large number of players on a minimum number of machines.*

*A good example of this is The Crystal Maze where each person in the club can be one of the characters in the team while the others cheer him on, or Sensible Soccer where each person can run a league team.*

*Finally I am sure that if you keep on reading the magazine the whole computer world will become less complex. The problem with computing is that you have to know a lot of simple things.*

*Put together they look complex but the light will dawn. Also the great magazine cover games will be a useful addition for your computer club's collection of software.*

# In two directions

## Mike Cook explores the bi-directional printer port

**THERE has always been nostalgia for a *golden age*, for times gone-by when things were simpler, purer and easier to understand. Increasingly I find myself thinking that things were much simpler when every Acorn computer had a user port just sitting there waiting to have my latest project attached to it.**

Well, on the recent releases from Acorn, the user port has started to make a comeback in the form of a bi-directional printer port and, following several letters from readers who were having difficulty using it, I have decided to investigate its potential this month.

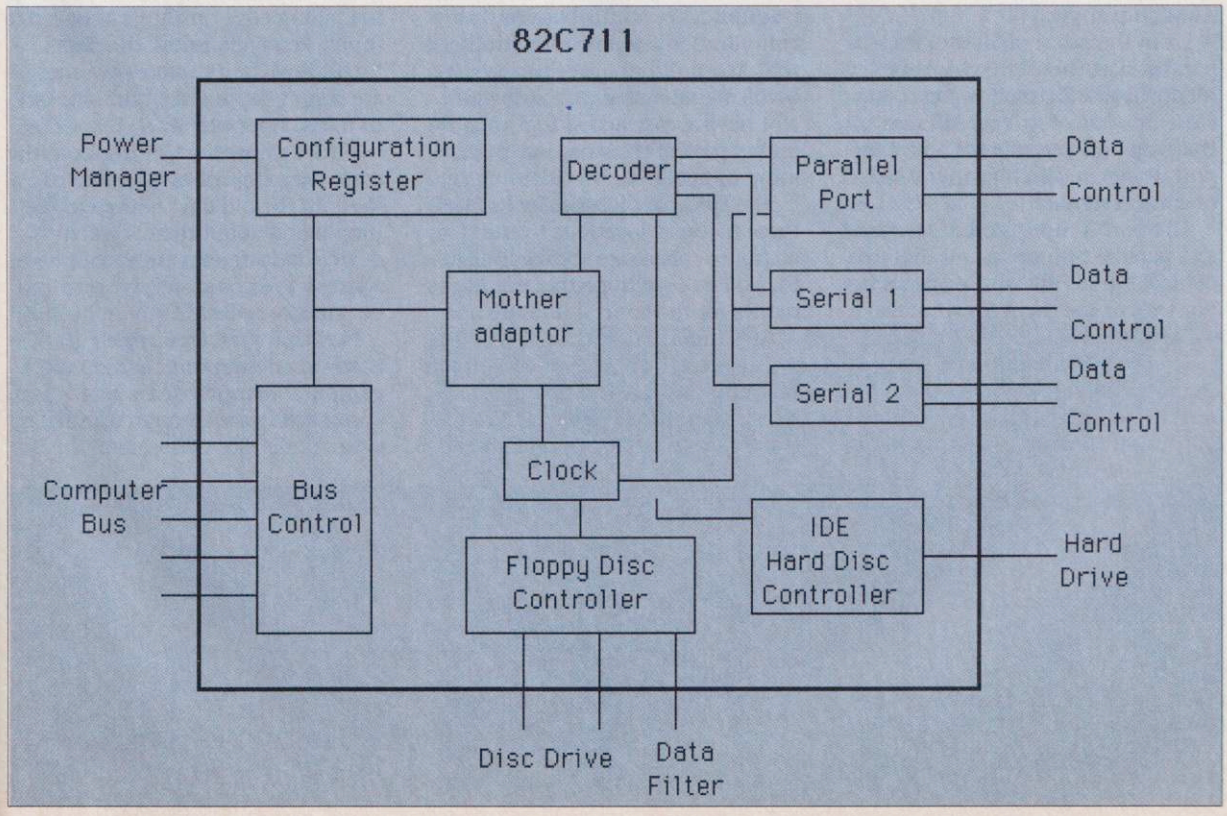
The printer port on the A5000 and others is not an entire chip but only a small part of one. It is part of a Universal Peripheral Controller or UPC and the standard chip fitted in Acorn machines is the 82C711 or the 82C712.

The chip has been designed for the express purpose of supporting PC clones and, as such, has a large potential market.

The secret of its success is in combining a great deal of circuitry at a comparatively modest price. It is housed in a 100- pin, PQFP package, that's the square ones that need special extractor tools. A glance at Figure I will reveal just how much is packed into this chip.

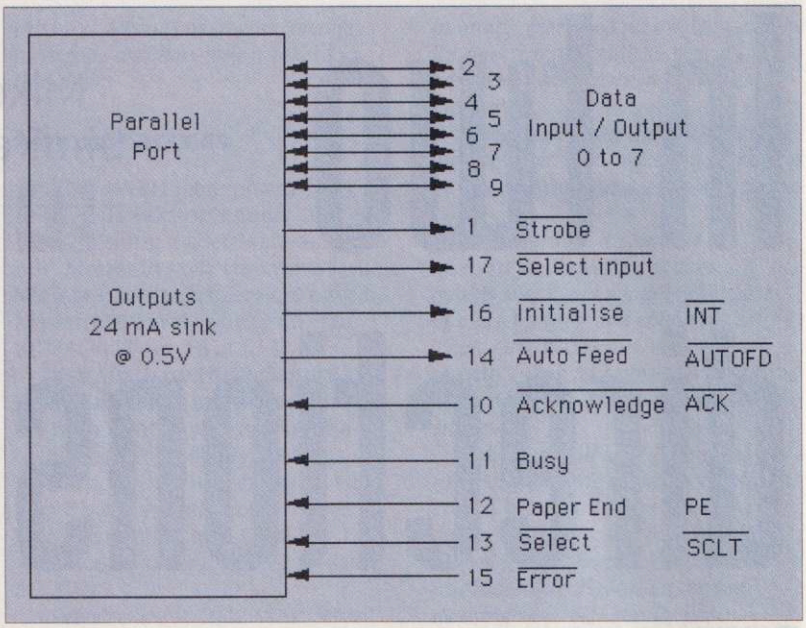
There are two serial ports and a parallel port, as well as a floppy disk controller and a hard disk controller. You can see how attractive it looks to a computer manufacturer, replacing at least five other large chips.

You can also see what a waste it would be to provide an upgrade ➤




● *Figure I: The block diagram of the 82C711 Universal Peripheral Controller chip*

● *Figure II: A close up of the Parallel Port*




➤

board for the older models, simply to give them a parallel input port.

That is why I have not designed one. It would have to be located in a physically different address to the standard and would cause all sorts of incompatibility with devices designed to run on the built-in ones.

There are minor differences between the two types of UPC. The 711 has a power manager which allows each port to be powered down to save current.

The 712 does not have this, but has an extra output which goes low when a certain address is accessed – this is meant to be used for a joystick interface.

The other difference between the two is in the address decoding/ timing used in the PC. The 711 is designed to be placed on the mother board and the 712 on an adaptor card. This does not cause any problems as the Acorn engineers have to add some extra circuitry to make it work with the ARM chip anyway.

From the point of view of the parallel port these two chips are identical and Figure II shows a close-up view of it. You will see that you don't simply get an 8-bit port, there are also a further 9 bits of control signals.

The port is meant to be interfaced to a parallel printer and all the control signals are labelled as such, but we can use them for whatever we like.

There are five inputs and four outputs which have quite respectable drive capacity. Each output can sink up to 24mA, that is, switch 24mA through itself to ground. This compares with the 2mA drive capacity of the VIA user port on the old model B.

However, the eight data lines are not so flexible as the old port, all eight have to be inputs or outputs, you can't mix them. Still, you do have a total of 17 lines in all, nearly the same as the old user port and printer port combined.

Figure II also shows the pin number on the 25-way, D-type printer socket on the back of the computer. My one regret with this is that Acorn did not see fit to feed a 5-volt signal out of this connector. Not having easy access to 5 volts makes project construction that bit more difficult.

The UPC parallel port looks like three memory locations to the computer, these are shown in Figure III. You will see the rather cryptic names for the control lines tie up with Figure II.

There are, however, three symbols that don't tie up. The first is R, which stands for reserved. This simply means that, at present it doesn't do anything, but in future versions of the chip it might, so don't alter it for the moment.

The second is the DIR bit in the control register. This controls the direction of the flow of the data on all eight data bits. When this is zero the port is an output and when one the port is an input.

The final bit in the control register IRQEN, enables the interrupts. A one here will generate an interrupt when there is a falling edge on the Acknowledge input. Remember the other bits might have fancy names but they are simply input or output bits for us to use how we want.

If that's how the UPC looks to the computer, how does it look to us? Well, in the old days – sorry to keep harping on about them – each device had a fixed hardware address. We could simply store our numbers there.

Nowadays, as a machine's hardware design can change, computer manufacturers prefer us to access hardware through operating system calls. So Acorn have

● *Figure III: The 82C611 Parallel Port Registers*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DATA | | | | | | | | Data |
| Busy | $\overline{ACK}$ | PE | $\overline{SCLT}$ | $\overline{ERROR}$ | R | R | R | Status |
| R | R | DIR | IRQEN | $\overline{SLCTIN}$ | $\overline{INT}$ | $\overline{AUTOFD}$ | $\overline{STROBE}$ | Control |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |

provided three system calls to allow us to interact with the port. Basically they allow us to:

- Read parallel data and status register
- Write parallel data
- Read/Write the control register

The first two are quite straightforward to use, with register zero giving the operation, and information being sent and returned in registers one and two.

The third operation is a little more tricky to use as it performs both read and write in one operation. The state of the control register is determined by the formula:

```
new state = (old state AND R2) EOR R1
```

Now this can look confusing, I know it confuses me, but you simply have to think what you want to do. For example, if you just want to write a fresh value, with no regard for what was there already, simply put the value in R1 and make R2 zero.

However, if you want to leave any bit unchanged, that bit must be set in R2 and clear in R1. To set a bit to one, it must be clear in R2 and set in R1, and finally, to clear a bit it must be clear in both R1 and R2. Simple isn't it!

Let's look at an example. Suppose we want to set the strobe, clear the INT and leave the rest unchanged. We first work out R2 with a one in the bits we don't want to change – this gives us 111010 or &3A.

Next we work out R1, with a one in each bit we want to set and a zero where we want to clear or leave unchanged. This gives us 000001 or simply 1.

The operation to read/write the control registers is number 2, therefore the complete instruction for this in Basic is:-

```
SYS "Parallel_Op",2,1,&3A TO ,A%,B%
```

This will return the old value of the Control register in the variable *A%* and the new value in *B%*. You have to make sure that, when you are accessing the control register, you don't alter the values of the direction bit and the interrupt request bit, otherwise you might get some unexpected results.

To illustrate all this I have written a small test program on this month's disk. It is called *Bi-Di_Mon* and will allow you to give your port a thorough test out.

One option simply puts a continuous binary count to the outputs. I found that the least significant bit changed every 0.6 mS on an A5000, that corresponds to a frequency of about 800Hz. This signal was very jittery due to the many, and constant, interrupts generated by the rest of the system.

When I looked at using the port as inputs I got quite a surprise. At first I thought it wasn't working, as the standard way that inputs work is that with nothing connected to them they take on a value of a logic one – we say they float high.

Now the inputs of this chip behave totally differently. If you connect the input to earth it goes to a logic one and stays there – it only goes to a logic one when you connect it up to 5 volts. Even when disconnected it remains at a logic one until it is connected to earth again.

Now this can pose a bit of a problem as 5 volts are not available on the port for testing. I overcame this by using one of the control outputs that I had set to a one.

This could be used as the source for many pull-up resistors, if you wanted to have a simple input without any external supply, and this is shown in Figure IV. I think this is the reason some of my readers have been having trouble with the input side of the port.

The Programmer's Reference Manual suggests that when you are playing with the printer port like this, you lock it off so that other multi-tasking applications can't access it at the same time. This is to treat the parallel port like a file, so before you start you issue:

```
Lock% = OPENOUT("parallel:")
```

and when you have finished you release the port with:

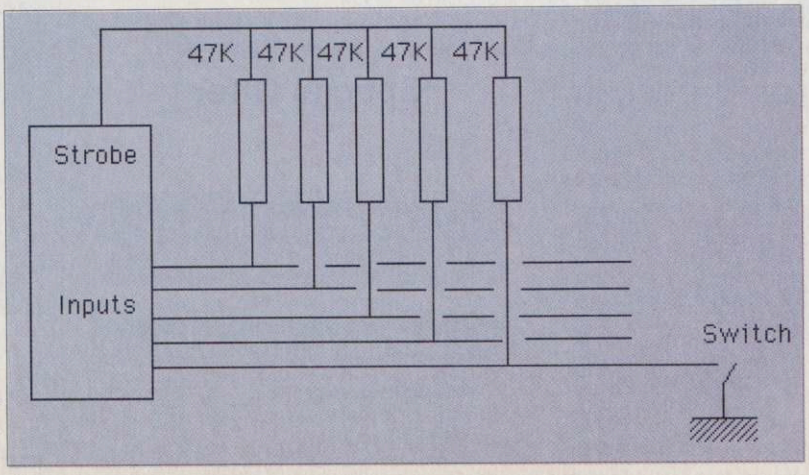
```
CLOSE#Lock%
```

Now this is only important during multi-tasking, for development purposes it is best to leave this out until the final version. This is because inevitably a development program will crash before you can exit it cleanly.

Consequently, the next time you run you will find that the port is already open and you will have lost your handle reference to allow you to close it. Therefore these are REMed out in the test program.

● *So there you have it, with the increased use of this bi-directional printer port perhaps we will get back to the good old days, with everyone having the same interfacing capability.*

*Perhaps I might indulge my nostalgia for old fashion computing and get a state of the art PC. Well, perhaps the good old days were not that good after all.*




● *Figure IV: Using a control output to provide multiple pull ups*

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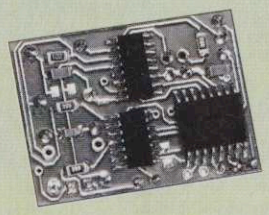

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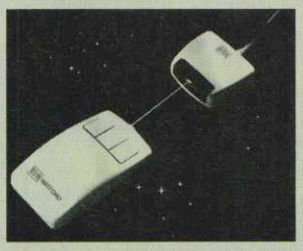

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| Apocalypse | £14 |
| Arcade 3 Compilation | £11 |
| Battle Chess | £21 |
| **Birds of War** | **£25** |
| Black Angel | £23 |
| Boogie Buggie | £14 |
| Break 147 & Superpool | £24 |
| Bug Hunter in Space | £9 |
| **Carnage Inc.** | **£20** |
| Cataclysm | £15 |
| Champions Compilation | £21 |
| Chess 3D | £14 |
| Chocks Away Compendium | £26 |
| Chocks Away Extra Missions | £17 |
| Chopper Force | £18 |
| **Crystal Maze** | **£29** |
| Cyber Chess | £25 |
| Cycloids | £17 |
| Demons Lair | £18 |
| **Dungeon** | **£24** |
| Ego Repton 4 | £17 |
| Elite | £31 |
| Enter the Realm | £17 |
| E-Type Compendium | £17 |
| E-Type Extra 100 Miles | £14 |
| Fervour | £18 |
| **F.R.E.D.** | **£17** |
| Galactic Dan | £14 |
| Games Wizard | £17 |
| Gods | £18 |
| Grevious Bodily Arm | £14 |
| **Haunted House** | **£20** |
| Heimdall | £22 |
| Hero Quest | £21 |
| Holed Out Compendium | £17 |
| Interdictor 2 | £22 |
| Ixion | £22 |
| Jahangir Khan Squash | £19 |
| James Pond | £18 |
| **James Pond 2 - Robocod** | **£21** |
| Lemmings | £18 |
| **Lemmings 2 - Tribes** | **£22** |
| Lotus Turbo Challenge II | £18 |
| Mad Professor Mariati | £14 |
| Magic Pockets | £22 |
| Master Break | £13 |
| Man at Arms | £14 |
| Manchester Utd in Europe | £18 |
| Nebulus | £18 |
| Oh No! More Lemmings | £14 |
| Omar Sharif's Bridge | £18 |
| Pandora's Box | £17 |
| Pipe Mania | £15 |
| Play It Again Sam 1 | £17 |
| Play It Again Sam 2 | £17 |
| Play It Again Sam 3 | £17 |
| Populous | £21 |
| Powerband | £14 |
| Powermonger | £24 |
| Quark | £19 |
| Quazar | £10 |
| Real McCoy 2 | £21 |
| Real McCoy 3 | £21 |
| Real McCoy 4 | £21 |
| Return to Doom | £16 |
| Repton 3 | £14 |
| **Saloon Cars Deluxe** | **£24** |
| Sensible Soccer | £22 |
| **Sim City** | **£21** |
| Simon the Sorcerer | £31 |
| **Stunt Racer 2000** | **£24** |
| SWIV | £18 |
| **Sylvia Lane** | **£18** |
| Striker | £17 |
| Technodream | £18 |
| The Last Ninja | £18 |
| Twin World | £13 |
| **Virtual Golf** | **£24** |
| Warlocks | £24 |
| Worldscape | £16 |
| White Magic 2 | £15 |
| **Xenon 2** | **£21** |
| **Zool** | **£18** |

### TOP TEN GAMES

| | |
|---|---|
| ① Lemmings 2 - Tribes | £22 |
| ② Zool | £18 |
| ③ Gods | £18 |
| ④ Sensible Soccer | £22 |
| ⑤ Turbo Challenge II | £18 |
| ⑥ Chocks Away | £26 |
| ⑦ Lemmings | £18 |
| ⑧ Populous | £21 |
| ⑨ Saloon Cars Deluxe | £24 |
| ⑩ SWIV | £18 |

## DTP

| | |
|---|---|
| Impression Junior | £63 |
| Impression II | £105 |
| Impression Borders Disc | £12 |
| Impression Business Sup. | £38 |
| **Impression Style** | **£85** |
| Impression Publisher | £135 |
| Impression Publisher OPI | £223 |
| Ovation | £82 |
| Desktop Thesaurus | £16 |
| Equasor | £36 |
| Font Pack - Avant Garde | £23 |
| Show Page | £139 |
| Spellmaster | £42 |
| Sleuth OCR | £40 |
| Type Studio | £37 |

## Word Processors

| | |
|---|---|
| DeskEdit 3 | £24 |
| Data Word | £14 |
| Easiwriter II | £114 |
| Easiword Plus | £42 |
| Pendown | £45 |
| Pendown Plus | £67 |
| Primeword | £50 |
| Talking Pendown | £55 |
| **Wordz** | **£84** |
| WordWorks | £39 |

## Spreadsheets

| | |
|---|---|
| Eureka | £95 |
| ProSheet | £39 |
| **Resultz** | **£105** |
| Schema | £89 |
| Schema 2 | £135 |

## Databases

| | |
|---|---|
| DataVision | £66 |
| Flexifile | £68 |
| Genesis Project | £49 |
| Genesis Professional | £119 |
| Knowledge Organiser | £75 |
| Masterfile III | £45 |
| Multistore v2.01 | £99 |
| Pinpoint | £64 |
| Pinpoint Junior | £23 |
| S-Base Developer | £139 |
| S-Base Developer Plus | £299 |
| S-Base Personal | £69 |

## Integrated

| | |
|---|---|
| **Acorn Advance** | **£85** |
| Desktop Office | £69 |
| Fireworkz | £145 |
| Pipedream 3 | £70 |
| Pipedream 4 | £117 |

## Languages

| | |
|---|---|
| Acorn Desktop Assembler | £118 |
| Acorn Desktop C | £179 |
| Acorn PC Soft | £89 |
| Control Logo | £20 |
| **Easy C** | **£45** |
| Logotron Logo | £45 |
| RiscBASIC Compiler | £66 |
| RiscFORTH Compiler | £66 |
| Robo Logo | £37 |

## Printer Drivers

| | |
|---|---|
| Expression PS | £19 |
| Citizen Colour Driver - OS 2 | £15 |
| Deskjet 500C/550C Driver | £15 |
| Epson JX Printer Driver | £15 |
| Star Colour Driver - OS 2 | £15 |
| TurboDriver - Canon BJ | £42 |
| TurboDriver - Epson Stylus | £42 |
| TurboDriver - HP | £42 |

## CD Software

| | |
|---|---|
| Acorn Education Directory | £29 |
| Artworks | £165 |
| Artworks Clip Art | £19 |
| British Birds | £150 |
| CD – 4 Disc Set | £149 |
| CD Francais | £120 |
| Creepy Crawlies | £90 |
| Dictionary of Living World | £175 |
| Dinosaurs | £124 |
| Grooves | £90 |
| Hutchinson Encyclopaedia | £99 |
| Illustrated Holy Bible | £23 |
| Illustrated Shakespeare | £23 |
| Image Warehouse | £53 |
| Revelation II | £98 |
| Sherlock Holmes | £23 |
| Space Encyclopaedia | £57 |
| Really Useful CD v1 | £47 |
| Really Useful CD v2 | £47 |
| Times & Sunday Times | £195 |
| Woodland | £144 |

## Graphics

| | |
|---|---|
| Artisan 2 | £42 |
| Autosketch II | £65 |
| ArcTist | £14 |
| Atelier | £59 |
| Artworks | £115 |
| Chartwell | £24 |
| Craftshop 1 | £18 |
| Craftshop 2 | £18 |
| Euclid 2 | £59 |
| Film Maker | £55 |
| GraphBox | £54 |
| GraphBox Professional | £102 |
| Illusionist | £68 |
| Image Animator | £65 |
| **Kid Pix** | **£34** |
| Plot | £66 |
| Poster | £74 |
| Presenter GTI | £65 |
| PrimeArt | £46 |
| **Pro Artisan 2** | **£99** |
| Render Bender II | £89 |
| Rephorm | £49 |
| Revelation II | £74 |
| Revelation Image Pro | £125 |
| Titler | £114 |

## CAD

| | |
|---|---|
| Arc PCB v1.7 | £79 |
| Arc PCB Professional | £169 |
| Arc PCB Schematics | £229 |
| CADet | £125 |
| SolidCAD | £65 |
| SolidTools | £169 |
| PowerRouter | £129 |
| Excellon Drill | £53 |

## Accounts

| | |
|---|---|
| Business Accounts System | £275 |
| Business Accounts Modules | £85 |
| Payroll Manager | £66 |
| Prophet Accounts | £131 |
| Home Accounts | £33 |
| Financial Accountant | £225 |
| Shareholder Professional | £195 |
| Micro Trader System | £275 |
| Micro Trader Modules | £75 |
| PlanING | £95 |
| ProjectING | £295 |

## Site Licences

| | |
|---|---|
| Advance Primary Licence | £181 |
| Advance Secondary Licence | £440 |
| Artworks | £540 |
| Impression Style | £435 |
| Impression II | £542 |
| Ovation DTP | £475 |
| Pinpoint | £379 |
| Pipedream 4 | £695 |
| S-Base | £399 |

## Communications

| | |
|---|---|
| ArcComm 2 | £38 |
| ArcTerm 7 | £64 |
| Hearsay II | £75 |
| ArcFax | £25 |

**SPECIAL OFFER**
Pace Microlin pocket FAX/Modem, supplied with ArcFax and ArcTerm7 software. Complete with connecting cables, etc.
**only £199**

### Software Offers

| | |
|---|---|
| • Acorn DTP | £20 |
| • First Word Plus | £15 |
| • Lemmings | £12 |
| • Chuck Rock | £10 |
| • Quest for Gold | £9 |
| • Pacmania | £9 |
| • Gods | £15 |

### On-Site Warranties

| | |
|---|---|
| 1yr - A3010, A3020 and A4000 | £25 |
| 1yr - all A5000 models | £34 |
| 3yr - A3010 and A3020 FD | £42 |
| 3yr - A3020 HD and A4000 | £51 |
| 3yr - all A5000 models | £68 |

## Miscellaneous

| | |
|---|---|
| Armadeus | £58 |
| Recordz | £32 |
| Rhapsody 2 | £45 |
| **Rhapsody 3** | **£78** |
| AUN/Level4 Fileserver | £369 |
| Speech! | £17 |
| Investigator 3 | £49 |
| Font Pack 1 | £10 |
| Font Pack 2 | £10 |
| Font Pack 3 | £10 |
| MultiFS | £29 |
| Notate | £57 |
| Vox Box | £45 |
| Score Draw | £45 |

### *Software Bundles*

- **Arcventure** £65
  Romans, Egyptians, Vikings
- **Linkword** £87
  French, German, Spanish
- **Lemmings &** £27
  Oh No! More Lemmings
- **Crystal Maze &** £44
  Games Wizard
- **Artworks &** £119
  Clip Art CD
- **Impression II &** £130
  Business Supplement
- **PC Emulator &** £155
  Acorn Advance
- **Ovation & Thesaurus** £69

## Books

| | |
|---|---|
| !Help 3 - RISC OS 3 | £10 |
| !Help - RISC OS 2 | £10 |
| !Help - Draw | £16 |
| Advanced BBC User Guide | £10 |
| Archimedes Assembly Lang. | £15 |
| Archimedes Operating Syst. | £15 |
| A3000 Technical Manual | £29 |
| A5000 Technical Manual | £65 |
| A3010 Technical Manual | £30 |
| A4 Portable Handbook | £7 |
| A4 Technical Manual | £65 |
| A4 Welcome Guide | £10 |
| A540 Technical Manual | £65 |
| Acorn to PC | £7 |
| Ansi C Rel.4 User Guide | £25 |
| **Artworks Made Easy** | **£15** |
| Archi Games Maker Man. | £15 |
| ARM Technical Data Guide | £14 |
| BBC BASIC User Guide | £20 |
| BASIC V - Dabhand Guide | £10 |
| Budget DTP on the Arc | £13 |
| C: A Dabhand Guide 3rd Ed. | £17 |
| Control on the Archimedes | £10 |
| First Impressions | £28 |
| File Handling for All | £10 |
| Good Impressions | £25 |
| Graphics on the Arm | £15 |
| Impression II - Dabhand Guide | £15 |
| Mastering 1st Word Plus | £14 |
| Master 128 Ref Man. Part 1 | £14 |
| Master 128 Ref Man. Part 2 | £14 |
| Master 128 Advanced Ref. | £5 |
| RISC OS Style Guide | £10 |
| RISC OS 2 Prog. Ref. Man. | £79 |
| RISC OS 3 Prog. Ref. Man. | £99 |
| RISC OS 3 Apps/User Gd. | £20 |
| **RISC OS 3 First Steps** | **£15** |
| Wimp Prog. for All | £13 |

## Home Office

Includes Pipedream 4, PC Soft with DR DOS 6, Easiwriter, Datapower, plus demonstration software.
**only £85**

## Learning Curve

Includes Acorn Advance - integrated software package, PC Soft with DR DOS v6, plus some demonstration software.
**only £42**

# Despite appearances, we offer you very little choice.

At **Watford Electronics,** we will only offer any product when we are convinced that we can sell it at the best price with the right level of support. It's an approach that our thousands of customers appreciate, for we are now celebrating twenty-one years in the business. So as you look through all the lists of items that follow and discover how competitive we are, you'll discover just how little choice you have. **You simply must call us.**

## Laser Printers

All Laser printers (excluding HP Lasers) include 12 Months On-Site maintenance

| | | |
|---|---|---|
| Brother HL4 | 4ppm | £398 |
| Brother HL6 | 6ppm | £422 |
| Canon LBP4+ 1.5M RAM | 4ppm | £635 |
| Canon LBP4U | 4ppm | £485 |
| Canon LBP-8 Plus IIIR | 8ppm | £1559 |
| Canon LBP-8 IV 600DPI | 8ppm | £925 |
| Epson EPL5000 | 6ppm | £433 |
| Epson EPL-5200 | 6ppm | £483 |
| Epson EPL-7500 PS | 6ppm | £1135 |
| HP Laserjet 4 ML | 4ppm | £747 |
| HP Laserjet 4 | 8ppm | £962 |
| HP Laserjet 4L | 4ppm | £469 |
| HP Laserjet 4M | 8ppm | £1286 |
| HP Laserjet 4P | 4ppm | £717 |
| HP Laserjet 4MP | 4ppm | £979 |
| NEC610 Super Script | 6ppm | £422 |
| NEC Silentwriter S102 | 6ppm | £914 |
| NEC Silentwriter S102P PS | 6ppm | £1284 |
| OKI OL400EX | 4ppm | £385 |
| OKI OL410EX | 4ppm | £523 |
| OKI OL 830PS | 8ppm | £799 |
| Panasonic KX-P4400 | 4ppm | £360 |
| Panasonic KX-P4410 | 5ppm* | £424 |
| Panasonic KX-P4430 | 5ppm* | £530 |
| Panasonic KX-P5400 PS | 4ppm | £599 |
| Panasonic KX-P4440 | 10ppm* | £779 |
| Star LS-5 | 5ppm | £442 |
| Star LS-5 EX (RISC Based) | 5ppm | £510 |
| Star LS-5 TT True Type+Mac | 5ppm | £732 |

*2 years on-site warranty

### Laser Toners

| | | | |
|---|---|---|---|
| Canon 2, 3 & 4 | £52 | KX-P4400/5400 | £12 |
| Canon LBP4U | £55 | KX-P4450/50i/55 | £19 |
| Canon 8/Star LP8 | £56 | KX-P4410/20/30 | £29 |
| Canon LBP8-IV | £72 | NEC 290 | £78 |
| Epson GQ | £12 | NEC S60/60P/62P | £89 |
| EPL 40/41/4300 | £63 | OKI OL400/800 | £21 |
| EPL 5200 | £90 | OKI OL400e | £17 |
| EPL 71/7500 | £117 | Star LP4 | £48 |
| HPII/D, III/D | £55 | Star LS5 | £63 |
| HP IIP, IIIP | £48 | VM800 8K pages | £99 |
| HP4/4M | £72 | Qume Crystal(3) | £99 |
| HP Laserjet 4L | £49 | | |

### Laser RAM Upgrades

| Type | 1M | 2M | 4M | 8M |
|---|---|---|---|---|
| HPIIP; III/P/D | £54 | £90 | £132 | |
| HPII & IID | £65 | £110 | £175 | |
| HPIIIsi | £57 | £85 | £158 | £299 |
| LJ4/4L//4M | £65 | £79 | £145 | £299 |
| EPL40/41/4300 | £70 | £110 | £205 | |
| EPL 50/5200 | £– | £115 | £215 | |
| KX4410/30 | £70 | £110 | £185 | |
| KX4420/50i | £65 | £89 | £149 | |
| KX4400 | £89 | £129 | £239 | |

### Jetpage Postscript Cartridge

- HP IIP/IIIP £225
- IID & III £227

### Various Add-Ons

- HP Premier Font Collection £19
- Laserjet Various Font C'tridges **from £45**
- HP Postscript Module for LJ4 £270
- Laserjet 4 Powered envelope feeder £199
- Jetdirect Ethernet Card for Laserjet IIIsi/4/4Si £339
- 500 Sheet paper cassette (3rd Bin) £205
- HPIIP/IIIP Lower Cassette Tray £115
- Canon LBP-4 Lower Cassette Tray £96
- Ozone Filter P4420 £9; P4450/55 £20

## Panasonic Printers

| | Printer | CSF | Ribbon |
|---|---|---|---|
| KX-P1170 | £91 | £59 | £6 |
| KX-P1624 | £210 | £126 | £8 |
| KX-P1695 | £267 | £126 | £6 |
| KX-P2023 | £122 | £155 | £8 |
| KX-P2123M | £132 | £69 | £7 |
| KX-P2124 | £210 | £89 | £7 |
| KX-P2624 | £255# | £126 | £8 |

#Includes 12 months on-site warranty

- Colour Kit for KX-P2180; KX-P2123 and KX-P2124 £30
- Dustcover for 80 column printers £6
- Serial Interface for above Printers £46
- Black Ribbons for P1081, 1180, 1124 £7
- 32K Buffer for above Printers £16

P.S. Our original Panasonic Ribbons are guaranteed to last 3 million characters.

## Canon Bubblejet Printers

| | Printer | CSF | 2nd Bin | Ink Cart |
|---|---|---|---|---|
| BJ10SX | £154 | £43 | – | £15 |
| BJ200 | £202 | – | – | £16 |
| BJ230 | £276 | – | – | £16 |
| BJ300* | £322 | £88 | £88 | £11 |
| BJ330* | £372 | £92 | £79 | £11 |
| BJC600 | £418 | – | – | £7.50 |
| BJC800 | £1075 | – | – | £16 |

Black Cart. for: BJC600 £6; BJC800 £13

- Optional Battery Pack for BJ10EX/SX £33
- BJ10E/10EX/10SX/200/230 Jumbo Ink Refill pack (twice cartridge volume) £12

* includes 12 months on site warranty

## Citizen Printers

| | | | |
|---|---|---|---|
| 120D+ parallel | £90 | Swift 90 | £115 |
| 120D+ Serial | £109 | Swift 90C | £122 |
| ABC 24 pin Mono | £115 | Swift 200 | £142 |
| | | Swift 200C | £187 |
| ABC 24 pin Colour | £135 | Swift 240 | £170 |
| | | Swift 240C# | £187 |

2 years warranty on Citizen Printers.
# FREE Windows Printer Driver

- Swift 24 Ribbons: Black £4 Colour £13
- Cut Sheet Feeder for 80 col. printers £75
- Citizen 120D Ribbons £3.50

## Star Printers

| | Printer | CSF | Ribbon |
|---|---|---|---|
| LC15 | £179 | £135 | £5 |
| LC100C | £103 | £65 | £9 |
| LC24-15 Mk2 | £240 | £135 | £5 |
| LC24-30C | £169 | £– | £– |
| LC24-100 | £130 | £69 | £5 |
| LC24-300C | £224 | £– | £– |
| LC24-20 Mk2 | £170 | £65 | £5 |
| LC24-200C | £200 | £65 | £12 |
| LC200 C | £147 | £65 | £12 |
| SJ144 colour | £345 | £– | £– |
| XB24-200C | £320# | £80 | £12 |
| XB24-250C | £385# | £139 | £12 |

# Includes 12 months on-site warranty

- Black Ribbons for Colour Printers £5
- Serial 8K I'face LC10/15/24/200 £52
- 32K Buffer LC/XB24-10; 15; 200 £52

## Scanners

**AT –** HP-ScanJet IIP **£500;** IIC £949
**PS/2 –** HP-ScanJet IIP **£501;** IIC £950
HP Auto Doc Feeder IIP **£229;** IIC £365
HP ScanJet II CX £689
Epson GT-6500 A4 incl. Pic Publisher LE, Omni Direct Pk Port F, Interface card & Cables £530
Epson GT 8000 A4 Scanner with Pic Publisher LE, Omni Direct & SCSI Interface Card £745
Epson A4 Scanners: Supplied complete with Pic Publisher LE, Omni Direct OCR, Interface card & Cables
**GTX6500P** £535 **GTX6500S** £599
**GTX8000P** £699 **GTX8000S** £760

## Epson Printers

| | Printer | CSF | Ribbon |
|---|---|---|---|
| DFX5000C | £1095 | £– | £23 |
| FX870 | £228 | £47 | £4 |
| FX1170 | £284 | £69 | £6 |
| LQ100 | £119 | £– | £4 |
| LQ150 Col | £165 | £– | £– |
| LQ570+ | £189 | £45 | £4 |
| LQ870 | £335 | £45 | £6 |
| LQ1070 | £289 | £69 | £6 |
| LQ1170+ | £404 | – | £10 |
| LQ2550 | £667 | £360 | £6 |
| LX100 | £109 | £– | £4 |
| LX400 | £91 | £69 | £4 |
| LX850+ | £134 | £69 | £4 |
| LX1050 | £174 | £125 | £6 |
| SQ870 | £415 | £170 | £23 |
| SQ1170 | £560 | £155 | £23 |
| Stylus 300 | £178 | £– | £10 |
| Stylus 800 | £185 | £– | £10 |
| Stylus 1000 | £344 | £– | £10 |

### Epson RS232 Interface

Standard **£28;** +8K Buffer £75

- LQ100 Tractor Feed £29
- FX850/LQ800/850 Tractor Feed £69
- FX/LQ1050 Tractor Feed £85
- LQ2500/2550 Tractor Feed £90
- Dustcovers for 80 col printers £6

## NEC Printers

| | Printer | CSF | Ribbon |
|---|---|---|---|
| P22Q | £134 | £59 | £6 |
| P3Q | £– | £– | £– |
| P32Q | £245 | £79 | £6 |
| P72 | £386 | £115 | £8 |
| P90 | £562 | £115 | £8 |

- Black Ribbons P20; P32 £6
- Ribbons P60/70/P90 Black **£8;** Colr £14
- P60/70 Colour Option Kit £59
- CSF for P20 **£59;** P60 **£89;** P70 £89

## Universal Printer Sharers

Connect up to 4 Micros to 1 printer or 4 Printers to 1 Micro with our combined, Sharer/Changer switch boxes.

### Standard Low Cost Sharers

| Connects | Serial | Parallel |
|---|---|---|
| 2 to 1 | £8 | £9 |
| 3 to 1 | £11 | £12 |
| 4 to 1 | £15 | £16 |

### Professional Sharer Units

| Connects | Serial | Parallel |
|---|---|---|
| 2 to 1 | £12 | £13 |
| 3 to 1 | £15 | £17 |
| 4 to 1 | £24 | £26 |

## Auto Printer Sharer Switch

| Connects | Serial | Centronics |
|---|---|---|
| 2 to 1 | £27 | £29 |
| 4 to 1 | £44 | £45 |
| 8 to 1 | – | £75 |

## 256K Multi Spooler

These Parallel Auto printer sharer switches have built-in 256K Buffer.

- 2 In / 2 out £99
- 4 In / 2 out £115
- 8 In / 1 out £149

(Cables for all printer switches are from £5 each please specify the type required when ordering.)

## Compact Converter Unit

Serial to Parallel & Parallel to Serial £32

**24-Hour Credit Card Order Line**
**0582 74 55 55**

## Hewlett-Packard Printers

| | | | |
|---|---|---|---|
| DJ310 Mono | £167 | D-Writer 510 | £189 |
| DJ310 Col. Kit | £28 | D-Writer 500C | £235 |
| DJ510 | £189 | D-Writer 550C | £375 |
| DJ500C | £235 | Paintjet XL300+ | £1630 |
| DJ550C | £346 | Quiet Jet+ | £299 |
| DJ1200C | £POA | DJ Portable+CSF | £206 |
| DJ1200C PS | £1373 | | |

+ Includes 12 months on-site warranty
3 years on-site maintenance available as follows:

| | |
|---|---|
| DeskJet & DeskWriter mono | £55 |
| DeskJet & DeskWriter colour | £65 |

- Paintjet Cartridge Black £17; Colour £27
- DJ Portable CSF £49; Carrying Case £49

### Desk Jet 500 Accessories

- Ink Cartridges Black £13; Colour £21
- High Capacity Ink Cartridges Black £20
- Ink refill Double Pack (JetFill) £10
- Ink refill High Capacity (JetFill) £13
- 256K RAM Cartridges 510/500C/550 £49
- Epson FX Emulation Cart.(500 mono) £45
- DJ 500/510/550 Dust Covers £6
- 636G 50 x Transparencies A4 £35
- 636J 50 x Glossy Paper A4 (also XL) £35
- 630Z 50 x Cut Sheet Paper A4 £15
- 500 Sheets A4 90gms Cartridge paper £7

### Plug In Font Cartridges for DJ 500

22706B - Prestige, Elite, Line Draw £55
22706C - Letter Gothic & HP Line Draw £56
22707P - Proprint Emulation Cartridges £57

### Fujitsu Printers

| | Printer | CSF | Ribbon |
|---|---|---|---|
| B100 Inkjet | £146 | £35 | £14 |
| B200 Inkjet | £209 | £35 | £14 |
| DL1150 | £209 | £99 | £6 |
| DL1250 | £309 | – | – |
| VM600 Laser | £529 | – | – |
| VM600E | £769 | – | – |

## Roland Plotters

| | | | |
|---|---|---|---|
| DXY1150 | £575 | DXY1250 | £725 |
| DXY1350 | £939 | DPX2600 | £POA |
| Sketchmate A4 | £335 | A3 | £449 |

## Printer Labels

**(On continuous fanfold backing sheet)**

| | |
|---|---|
| 1,000 90 x 36mm (Single Row) | £4.50 |
| 1,000 90 x 36mm (Twin Row) | £4.60 |
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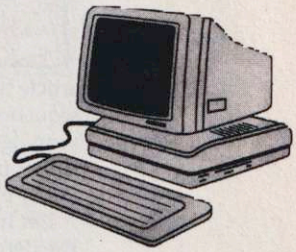

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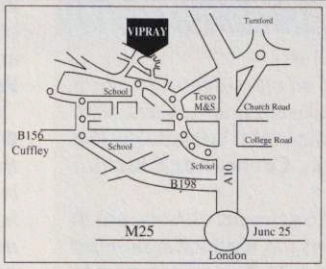


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# Musically inspired

I HAVE been following Ian Waugh's excellent series on Midi and sequencing and in the concluding article he mentioned the Inspiration sequencer. I tried to buy this several years ago from a company called Ampsound but all I got was a program full of bugs which constantly crashed.

On trying to get a working copy the defunct Ampsound couldn't help, so I went to the writers. They told me they too were out of business and couldn't help. Can I get a working copy of Inspiration from anywhere? – **Tony Lui, Bognor Regis, West Sussex**

● *In reply to this we recently had this communication from our contributor Terry Blunt:*

"I thought you would be interested to know that I have been able to coax Inspiration into working on RISC OS 3.1. There are a few omissions, however, and those features I've disabled by blanking out the related icons.

My copy of Inspiration is now more stable than the original – the dongle was responsible for some of the crashes – but you can no longer set cue points or quantise. I have sent a copy of the modifications to Acorn and they are interested in distributing this as an official patch.

It seems that Acorn are also considering a proper release of the product for RISC OS 3. They tell me that they had considerable involvement in the original implementation and are now trying to get hold of the full source files." – **Terry Blunt, Ashford, Kent**

*So watch this space ...*

## Bouquets in abundance

I USUALLY find myself contacting managing directors to complain, but not at Canon UK. Having recently purchased a Canon BJC600 I found I was experiencing problems and contacted their service department. They were helpful and courteous, but the problem was not solved. They promised to return my call and, what is more, did.

As a teacher I am very aware of positive as well as negative reinforcement and I would like to commend Canon's staff as the prompt service and response was very refreshing. – **G.J. Allsopp, Hednesford, Staffordshire**

I HAVE to take exception to the letter written by W. Bramham in the January issue. While I do agree about the publicising of Acorn and its associated products, I have found no problem in obtaining software.

For example, I ordered three separate items by post from The Fourth Dimension in Sheffield in December and I received all three items in a single package within seven days despite the Christmas post. – **G. White, Bewdley, Worcestershire**

## Changing archives

I NOTICE that in the last two MegaDisks the archived (DDC) programs are now ArcFSArc (3FB). The program I use to catalogue the floppies only works with DDC. I know it's no trouble to change it, but just wondered why the change and the advantage, if any. – **R. R. Proctor, Littleborough, Lancashire**

● *Originally both ArcFS and Spark used the same archive format – type DDC – but while Spark has concentrated on handling archive formats from alien machines (PC's, Macs and so on) ArcFS has concentrated on providing the best possible handling of an Acorn-specific archive format. But it meant that ArcFS and Spark had common filetypes with different structures.*

*Mark Smith, the author of ArcFS, finally decided to break from this and use his own filetype, 3FB, and avoid any further incompatibility problems. ArcFS now uses a very fast and robust format with duplicate directories to help deal with corrupted archives.*

*For this reason it's important that the read-only version of ArcFS on the current MegaDisk is the one that's used to de-archive the programs – there's a new one this month.*

## Mail order blues

I AM having a few problems with my new A3010 – I can't get any software for it. The Acorn is an excellent machine and I just

## Whys and wherefores

I HAVE an early A5000 with 40Mb hard disk and 4Mb of ram with RISC OS 3.10, ARM3 and there have been some things which have been puzzling me which I hope you can clarify.

For instance, there's ScreenSize. If I call up the Task Manager and scroll down to the System Memory Allocation it tells me I have 160k. If I call up configuration from the Applications on the iconbar it tells me I have 96k as does *status. Which is correct?

Also, I have two versions of the SharedCLibrary. The one in the !System directory, in the Module folder, shows 3.75 (03 May 1991) which was copied from the January 1994 MegaDisk. If I use *Help Modules it shows version 3.99, 23 April 1992. Again, which is the right one?

I bought a demonstration pack at the Wembley Acorn World show and one of the disks has a later version of CLib, 3.76 (28 May 1992). Can I use this? I cannot see any copyright message in it. Does this mean that it is not copyrighted and I can use it? Is the latest version of CLib always the best one to use?

Do you remember the Mini Office II you produced, the one on the rom card for the BBC B? Well I had purchased one of these, but due to sideways ram I had in my BBC at the time it did not work properly so I returned it.

However it did enough to enable me to make a file in the word processor. Now, how can I get this file from a cassette tape to Edit on my A5000? I hope you can help.

Finally, I've seen an advertisement in Acorn Computing for a noise killer. The advertisers claim that computer noise is a health hazard – is this hazard real? – **W. Jackson, Cirencester, Glos**

● *The configure options control how much memory is allocated when the machine is switched on, whereas the amount actually required may be different. To be honest, you can configure most settings on a RISC OS 3 machine to be zero – apart from the font cache and system sprite area – because the system will take what it needs.*

*The system sprite area is an anachronism and would have been removed from the machine had it not been for the fact that some old programs use it. This can usually be set to zero as well.*

*As you are using RISC OS 3 you don't actually need the earlier versions of the SharedCLibrary in the System:Modules directory. However, again, some poorly designed programs get upset if they find it's not there, even when they don't use it. The SharedCLibrary most definitely is copyright, to Acorn.*

*To get your textfile on to a 32-bit machine you'll have to find someone with a BBC Micro that has a cassette and disk drive connected, and put the file on disk.*

*Then you'll need to transfer the file either to a 3.5in 640k ADFS disk, or use a transfer program to put the information across via the serial ports. There is no cassette system for the 32-bit machines.*

*Noise can be annoying but it's unlikely to be a hazard to most people.*

## Bit image modes

CAN you please tell me how to use my Acorn A5000 to drive my Epson RX printer in the bit image mode? When I had my BBC, I used my Basic programs:

```
*FX3,3                  screen off
VDU2                    printer on
VDU155,203,n1,n2        n1,n2 = number of bit image
                        data to be sent
PRINT CHR $(m1);
PRINT CHR $(m2);
PRINT CHR $(m3);
etc                     m1,m2,m3 ... = bit image data
VDU155,51,24            line spacing 24/216
VDU13                   carriage return
VDU1,10                 line feed
PRINT CHR$(mx) etc
VDU155,64               printer initialisation
VDU3                    printer off
*FX3,0                  screen restored
```

With the A5000 the printer does not respond to these instructions even when I work in the BBC Emulator. I suspect that the *screen off* instruction is not valid, but even when the screen is left on the printer does not respond.

It seems that something gets to the printer buffer because if the printer is subsequently activated I get some bit image data printed – the required data followed by garbage. Sometimes the printer starts to print the current time from the clock on the iconbar and continues indefinitely. Can you help? – **Peter Kenny, Lichfield, Staffs**

● *The best way of outputting to the printer under these circumstances is to treat it as a file using the command:*

```
Z%=OPENOUT"printer:"
```

*You can then send information to it using the appropriate file commands, like this:*

```
BPUT#Z%,CHR$155+CHR$203+CHR$n1+CHR$ n2;
```

*This Basic 5 version of the BPUT command sends a string to the output file – in this case the printer – and the semi-colon ensures that no carriage return is sent. You can send single characters with:*

```
BPUT#Z%,m1
```

*When you've finished close off the file with:*

```
CLOSE#Z%
```

*This method has several benefits, obviously it's easy to use, it prevents any other program from having access to the printer while you're using it and it's not affected by any other software issuing VDU commands.*

*Mike Cook uses this method in his Body Building article to prevent access to the printer port when inputting and outputting. He mentions the problem of losing the channel number if there's an error in the program.*

*You can issue a global *CLOSE from the command line but this is risky in a multi-tasking environment. An alternative is to save the channel number in a system variable which you can examine if there's an error.*

*So after the printer stream has been opened you can use a command like this:*

```
OSCLI("Set MyChannel "+STR$(Z%))
```

*Then, if there's an error, issue the command from Basic:*

```
*Show MyChannel
```

*which will display a number – say 53 – then you can type:*

```
CLOSE#53
```

*to close the channel before you try running the program again.*

don't know why nobody stocks the software. I have been to all the big software shops and they all keep saying mail order.

But how do you know what mail order companies you can trust and I would love to get some music demos. – **John Stevens, Liverpool**

● *For music see the PD libraries. It's very unusual to find untrustworthy mail order companies in the Acorn market because that's their main source of income.*

## Putting the boot in

I HAVE followed with interest your series for Newcomers for the Arc using RISC OS 3. I have changed my Desktop and found your column both confidence building and interesting.

I changed my desktop and made it very user friendly but my main problem is that on my A3010 I cannot get my desktop to boot automatically. I have tried resaving the task and altering the files but I can't get it to boot every time the computer is switched on. – **Alex Heazell, Haslingfield, Cambridge**

● *It's not clear from your letter whether you have a hard disk or not – however, it's not that important. The first point is that the drive to be booted from must be the default drive at switch-on. This is achieved using a number of configure commands. The first has to do with the filing system, normally this will be ADFS, but it might be IDEFS or SCSIFS in other circumstances.*

*Press F12 then type:*

```
*Configure FileSystem ADFS
```

*and replace ADFS with the appropriate system. Next you must specify which drive the Boot file will be on. For a floppy it will probably be 0 (zero) and for hard disk it would normally be 4:*

```
*Configure Drive 4
```

*You have to tell the operating system that you want booting to take place, so you use the command:*

```
*Configure Boot
```

*And finally you must alter an option on the disk itself to control the type of booting – there's Off, Load, Run and Exec – we want Run, which issues a run command on the file called !Boot on the disk in question.*

*The command is *OPT but we have to make sure it gets routed to the right disk. If you're using a floppy put the disk in the drive, then issue a command to make the disk (floppy or hard) the current one. For a floppy use:*

```
*Dir ADFS::0.$
```

*For a hard disk use the following command, or its equivalent for your system:*

```
*Dir ADFS::4.$
```

*Now you issue the cryptic OPT command:*

```
*OPT4,2
```

*That's about it apart from dragging the desktop Boot file to the disk's root directory. Next time you switch on, or Reset, the program will boot from the specified drive. In the case of a floppy you have to have the right disk in the drive too.*

**Want to write to us? The address is: Letters, Acorn Computing, Europa House, Adlington Park, Macclesfield SK10 4NP.**

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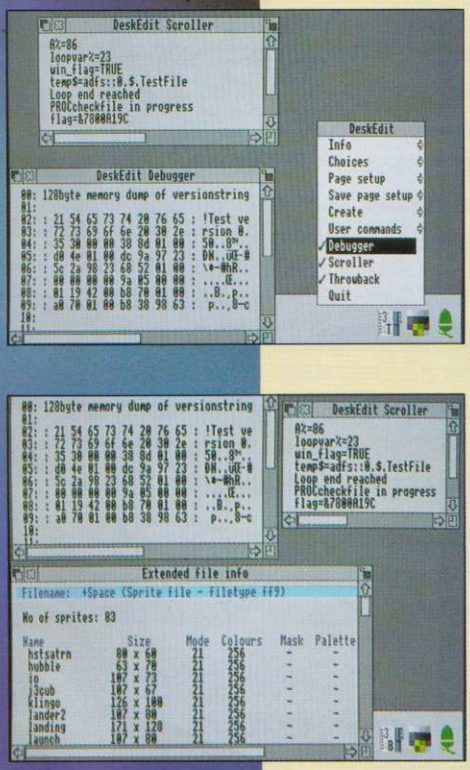


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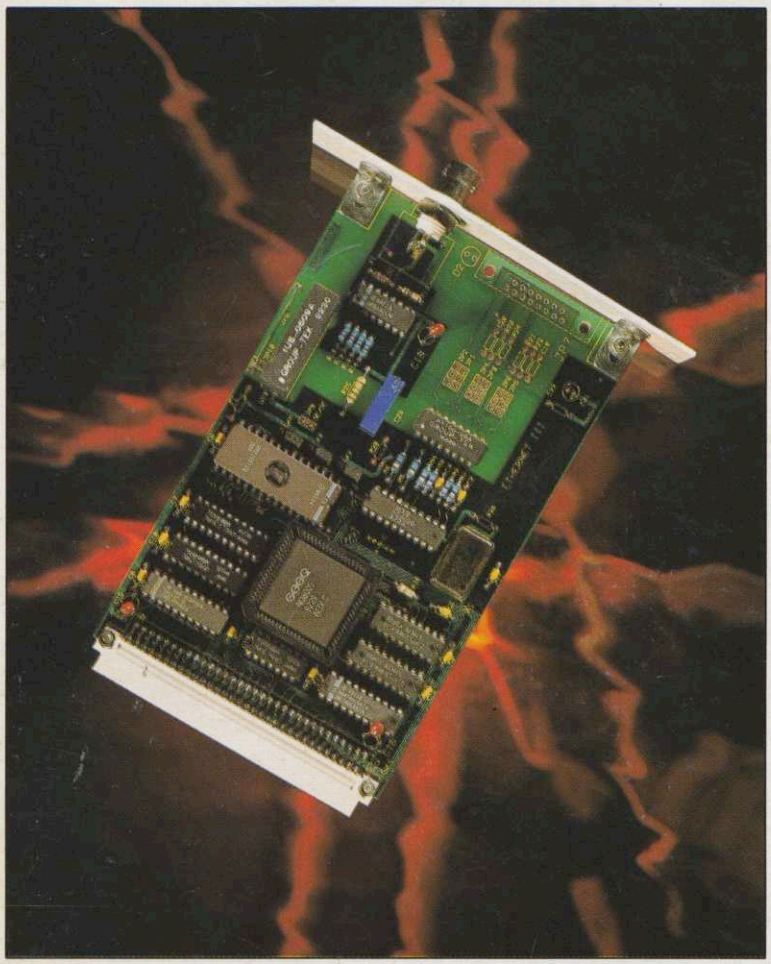

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