

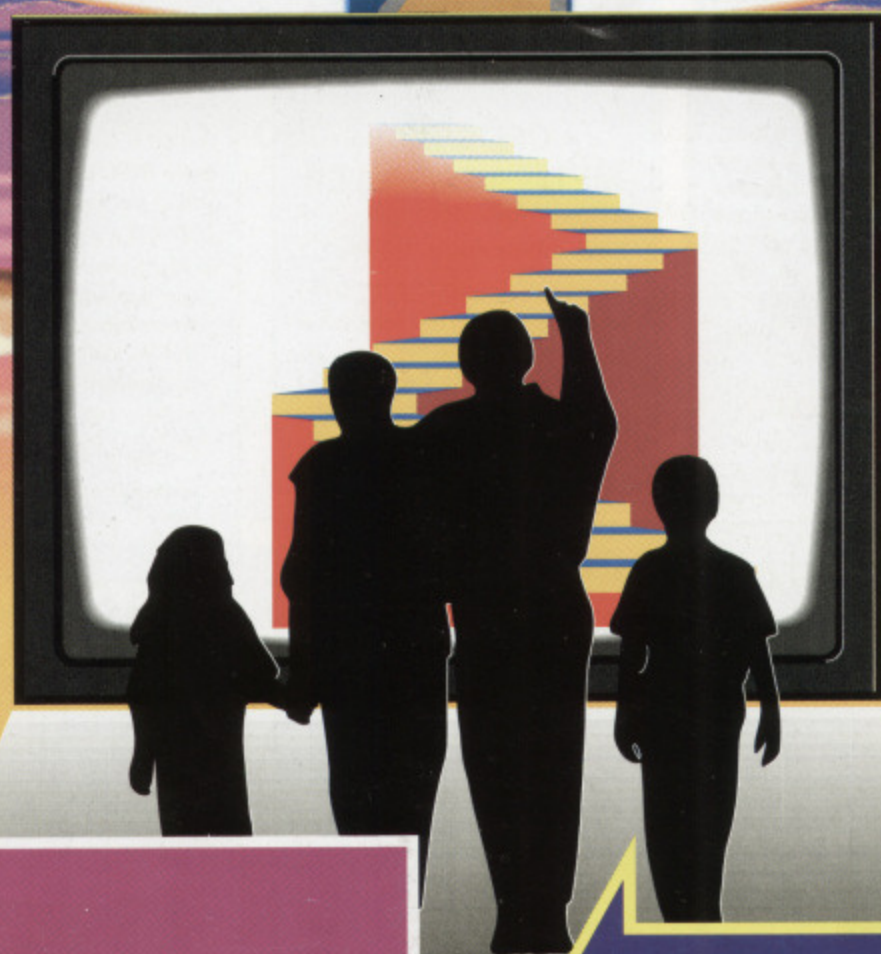
# THE MICRO USER

Volume 9

Number 8

October 1991

£1.95



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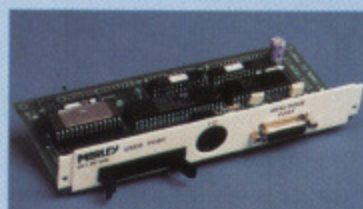
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## FREEBIES

Would you like to receive software packages for the 8 bit BBC Micro for free? Find out how on Page 15.

## SPECIALS

57

**Mozaic Madness**  
A simple but brain-teasing puzzle for all Acorn machines.



102

**Tai-Pei**  
Play this superb version of the classic patience game.



77

**100th Issue Results**  
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This symbol indicates that the feature contains at least one full length listing for you to key in on your micro.



All the major listings in this magazine are accompanied by checksums to help you key them in correctly.

*Get it right* ✓

For full details of how to use them see the article on page 56 of the February 1991 issue.

## CLASSIFIEDS

The best bargains in the world of all Acorn micros come from readers of The Micro User. Turn to Page 128 to find just what you're looking for – from cheap modems to complete computer systems.

## EDUCATION

23

**Update**  
Up-to-the-minute news of the Acorn range of micros in use in the world of education.



26

**Reviews**  
Catch up on the latest software for the BBC Micro series in schools, including:

- IMap-It
- PIPP Archimedes
- Imagine
- Hedgerows



121

**Let-Us**  
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## LET'S COMPUTE!

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**69** **Logo Lowdown**  
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**74** **Safe Scientist**  
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**117** **Hard Driving**  
How to arrange your hard disc for easier use.

**123** **Keyword Keys**  
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## Newcomers

**41** **UltraSonic**  
A new music package to accompany Arcade Game Creator.



**106** **IOrrery**  
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**119** **ARtCtulate**  
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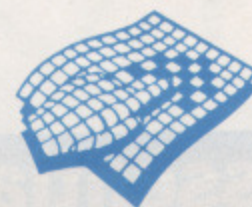
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**NEXT MONTH IN THE MICRO USER**

There are lots of handy utilities for all Acorn machines plus our PD section full of great money-saving ideas.



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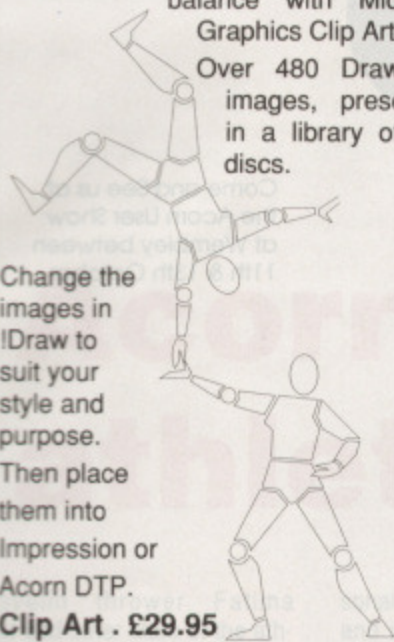
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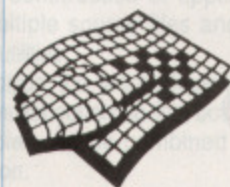
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# NEWS BEAT



## Acorn sponsor athletics stars

TOP javelin thrower Fatima Whitbread and other stars of the athletics world will soon be making personal appearances for Acorn Computers following a sponsorship deal reputed to be worth a six figure sum over the next two years.

Acorn have signed the deal with Fatima's Chafford Hundred Athletic Club at Thurrock in Essex. Formed nine months ago, its other members also include Linford Christie, Colin Jackson, Steve Backley and John Regis.

As their part of the agreement, athletes from the club will make per-

sonal appearances at Acorn events and in publicity material related to Acorn promotions.

"The technical expertise of Acorn, coupled with details of our training activities creates a combined programme that is both interesting and educationally stimulating for the country's up and coming young athletes", said Fatima who is president of the club.

"We are keen to encourage young athletes to develop, especially those who come from disadvantaged backgrounds.

"Acorn not only has an excellent

track record in UK schools but also its close involvement with those in society who have special needs ties in with our philosophy of helping those less fortunate than ourselves".

Acorn's marketing director, Mike O'Riordan, said: "We have a common objective in being able to help children achieve their full potential in education and sport.

"We are therefore delighted to form this partnership with the Chafford Hundred athletes and look forward to working closely with them over the coming months".

## YOUR MICRO USER

This issue of The Micro User introduces two innovative new sections designed to further increase the magazine's coverage of the Acorn computing scene. Both reflect the continuing influence of the BBC and Archimedes micros on the general computing scene and particularly the field of education.

● On Page 80 is the start of a tutorial series on the Archimedes and BBC A3000, The Essential Archimedes, which will give newcomers to these machines a great introduction to basic software ideas.

Coupled with The Essential Archimedes is our special offer of a free 3.5in disc, which contains demonstrations of some superb commercial programs that you can use with the series (see Page 33).

● On Page 65 we start another tutorial, based on the Let's Compute! magazine approach, giving younger readers a firm grounding on the BBC Micro.

Both eight page sections are in addition to – and not deducted from – the usual wide-ranging features to which all our readers look forward.

Another innovation this month are the cover-mounted vouchers, which can save you hundreds of pounds.

After all this good news, comes the down side. Regrettably, rising costs, plus the greatly increased size of the magazine, have forced a small price rise, the first in over three years.

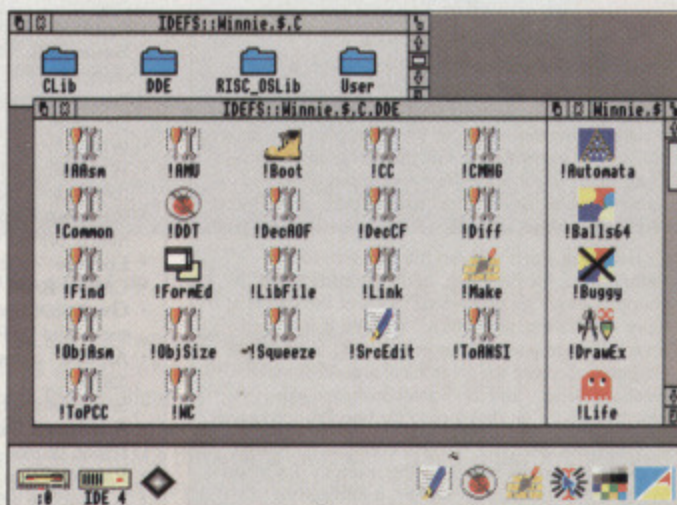
## Developer software takes Risc road

TWO major upgrades to Acorn's C and Assembler programming development software now integrate them into the Risc OS desktop and its fully integrated multi-tasking Wimp environment.

Called Acorn Desktop C and Acorn Desktop Assembler, they include all the tools needed for software development offering debugging, editing program source, generating object code, managing and construction of applications from multiple source files and using support utilities.

In addition, the two packages can be used simultaneously so that both C and Assembler can be combined in one application.

"The great step forward for these major new releases is that all the tools



Lots of useful tools

are now integrated into the multi-tasking Risc OS desktop", said Acorn's product manager Henry Howarth.

"This means that you can now carry out all aspects of software development simultaneously in a consistent and powerful environment".

Acorn Desktop Assembler costs £149, with a special upgrade offer of £75 for existing users. Acorn Desktop C costs £229 with upgrades for existing users of £85 for release 3 and £105 for releases 1 and 2.



Special version of IEdit







# A3000 is helping RAF recruiting

YOUNGSTERS thinking of joining the RAF are being helped in their decision by Acorn's BBC A3000 computers which are at the heart of 12 new interactive systems developed for the RAF's recruitment trailers which travel around the UK.

Designed by Simis Ltd of Guildford, who also wrote Interdictor, Interdictor II and Mig-29 Fulcrum, the systems allow youngsters to get a feel for the complexities of flying the RAF's Tornado. One of their first appearances was at the Royal Tournament at Earls Court.

Each potential recruit is allowed four minutes to complete one of three pre-defined missions which include air-to-air refuelling, air-to-air combat and landing an aircraft using the instrument landing system on an airfield.

Software designer Jonathan Newth believes 'the hardest of the three is the air refuelling simulation.



"Trying to position an aircraft precisely behind a tanker in three dimensions takes good co-ordination and timing, especially when you have to do it against the clock",

he said. The simulations are so popular that recruitment staff faced the problem of members of the public treating them as arcade games.

To remedy this, an on-screen

multiple choice questionnaire has been included which tests users' knowledge of the RAF. Only those who successfully answer the questions get to try the simulations.

"As a simulation can be based around anything that can be mathematically modelled and graphically represented, many companies that would never have thought of using this type of system in the past can now take advantage of it to increase their profiles", said Chris Tubbs, director of Simis.

The company have also designed a flight simulator based on the BBC A3000 for British Aerospace to use on exhibition stands. It was first used in Canada and is now appearing at a number of exhibitions all over the world.

Added Chris Tubbs: "The Acorn computer was chosen because of its exceptional graphics performance and also by the fact that the BBC A3000 is easily portable".

## Packing in an ARM 3 upgrade

WATFORD Electronics (0923 37774) have announced what is claimed to be the smallest, most compact ARM3 upgrade available for the Acorn range of computers - the Watford ARM3 MkII.

The new card measures 44mm x 53mm and stands just 6mm above the original Arm2 socket. And the price of the 25MHz ARM3 is equally small at an incredible £199.

This design has been achieved using latest CAD techniques which give a reliable four layer surface mount printed circuit board with separate supply and ground planes.

A new purpose-built 84 way gold plated connector ensures that firm contact is made with the original ARM2 socket.

The upgrade comes complete with a special tool and full fitting instructions. For BBC A3000 machines or users not into DIY installation, Watford will arrange for your machine

## Boxing clever

MINERVA (0392 437756) are about to launch the next step on from their popular Graph Box package. Graph Box Professional includes a number of enhancements and is designed for scientific and business use.

It features more sophisticated graphs and includes statistical analysis and a number of chart search facilities including "line of best fit" and "curve of best fit".

With Graph Box Professional, Archimedes users can measure between points on their graphs, can print from other packages and have the facility for a number of outline fonts not available for users of Graph Box.

Although the price has not been fixed, it is expected to be £129.99.

to be picked up, fitted with the card then returned.

Support software provided on disc gives a CacheKey module and a DeskTop application to control the ARM3. The CacheKey module activates the ARM3 through a simple combination of keys which can be user-defined.

The DeskTop application gives an indication of whether the cache is on or off and controls its operation by clicking on an icon.

Execution speeds vary with different programs, but Watford say a common factor of two is average while factors of three and up to five have been obtained.

Huge performance increases have been obtained using the PC emulator which runs three to four times faster with the Watford ARM3.

## More ARM3s

TWO other Archimedes suppliers, Aleph One (0223 811679) and Atomwide (0689 838852) have joined forces to announce an ARM3 upgrade for the A3000.

It increases the speed of all Risc OS applications, file operations and printing while retaining full compatibility with properly written software.

The unit has so impressed Acorn themselves that they ordered 71 in one month alone.

Atomwide have teamed up with Aleph One to offer a professional fitting service which allows the Aleph One ARM3 upgrade to be installed inside

the A3000. The A3000 ARM3 package costs £399.00 excluding VAT but including fitting and testing and courier collection and return usually within five working days.

The package is also available with an Atomwide 4Mb ram upgrade for £529.00 excluding VAT but with the same collection and fitting service.

## Fax turns scanner

THE Amstrad fax machine can now be linked to a BBC A3000 or Archimedes to become a 200dpi scanner in addition to its many other features.

Spacetech (0305 822753) have designed a small interface which plugs into the Econet space in the A3000 or Archimedes and connects to the serial port in the fax machine.

Software provided with the Faxscan card allows the fax machine to be used as a 200dpi scanner. It also allows the user to send facsimile messages direct from the Risc OS desktop, so DTP, Draw or Paint as well as text files can be sent without having to print out the document first. The software is fully Risc OS compliant and multi-tasking.

Card and software cost £99.50 plus VAT, or £49.75 if the Amstrad fax is bought from Spacetech.



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• 'Mastering the Wimp' — series on Wimp programming  
• 'Under the Lid' — hardware series  
• 'Assembler Workshop' — all about ARM Assembler  
• 'Beginning 'C' — series on C language  
• 'DTP/WP' — advice on using commercial software  
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## There's a Really good range for the Arc

LIVING up to its name, the recently formed Really Good Software Company is already coming up with a range of innovative and useful programs for Archimedes users.

Keyword Thesaurus version 1.51 is a Risc OS compliant Thesaurus with 10,000 words included on one 3.5in disc. Users can type in their word then choose an alternative with a similar meaning from the Thesaurus.

In addition words can be dragged from other applications or if the spelling of the source word isn't known exactly, part of it can be entered and possibilities from the Thesaurus are matched to it.

Once a suitable alternative word is chosen, it can be dragged directly from the Thesaurus window into whatever word processing package is being used. Soon to be added to Keyword Thesaurus v1.51 is a free word editor which will allow users to add their own words. Price £29.95.

MultiLink is currently the only multi-tasking serial link to connect 8 bit BBC Micros and Archimedes machines. Loaded from disc into the Archimedes, it opens a window to the disc in the BBC Micro and allows the user to drag files directly between the two machines.

Activated by two simple commands on the BBC Micro and a double-click on the Archimedes, the set-up takes just 30 seconds. The package costs £24.95 and can be supplied with the special cable for an additional £9.

Rounding off the packages cur-

rently available from The Really Good Software Company is MultiTTX, a front end for the Morley teletext adaptor.

Fully multi-tasking and Risc OS compliant, it allows Archimedes users to capture teletext pictures and text on the desktop as well as offering the standard teletext functions such as page selection, hold page, reveal hidden text and save page in teletext format or as text. Price, £29.95.

Two further packages are soon to be added to the Really Good range.

Twilight is a sophisticated screen save/data security program. It blanks the Archimedes screen with a variety



of animations or designs to prevent image burn-in on the monitor while the computer is not in use.

A number of different pattern modules are supplied or there is a facility for users to create their own. They can be activated after a user-specified time and the program is multi-tasking so printing can continue in the background if required.

Restoring the screen occurs either by pressing a key, moving or clicking

the mouse or, optionally, when a program outputs to the screen.

Twilight also includes a password feature to prevent unauthorised people using the machine while the owner is away, plus a facility for a user-defined hot key to make the screen go to sleep instantly – two useful features for office use where confidential data is used.

One save screen module has a memo facility for leaving messages on the default screen while you're away from your computer. Twilight will cost £29.95.

Also due soon is ARCooustic. Designed to make using an Arc an acoustic experience, it allows you to attach sound samples to thousands of different Archimedes events so that sound effects can accompany anything that happens on your machine.

For example, the *insert disc* request can be accompanied by a siren and *File not found* could blow a raspberry – the possibilities are endless. A whole selection of samples are supplied with the program, but any sound samples can be used.

One special feature is that different users can have their own personal sets of sounds on the same machine which can be set up with a couple of clicks of the mouse. ARCooustic will cost £24.95.

For further details of all products, write to The Really Good Software Company, P.O. Box 60, Ashton under Lyne, OL5 9WW.

## Stop Press Electron upgrade

AFTER many months work, Andrew Hildig of Slogger (0736 787272) reports that he is now close to completing his Electron upgrade to AMS Stop Press – developed to take advantage of the extra memory offered by the Master Ram Board.

As well as supporting all the standard features of AMS Stop Press, the upgrade is an internal version which uses no cartridge slots of Plus1 or Rombox Plus. It operates under Acorn ADFS, Slogger SEDFS, Pegasus 400, AP3, Solidisk and Cumana EDFS.

Designed for ease of use with no changing of discs and pages saved as standard files, it uses the full 64k memory of the Electron and scrolls much faster than standard Stop Press.

Stop Press 64 uses a standard mouse, 5.25 and 3.5in discs and reads View or Starword text files.

Hardware options are an internal board which fits inside the Electron case using the spare Basic Rom page and needing soldering, an internal board complete with user port for mouse, a cartridge needing no soldering or a cartridge with mouse user port.

Stop Press 64 will cost between £60 and £80 depending on hardware. Andrew's next Electron project is a digitiser.

## Triplets come cheaper

UNDER a special offer by Panda Discs, their music discs are being sold at reduced prices for the remainder of the year.

For people buying three or more, the discount price is £4 per disc. Those buying less than three still pay the full price of £6.

Available discs include 16 volumes for Hybrid Technology's Music 5000, three volumes for Hybrid's earlier Music 500 and three volumes for the System Music System originally known as the Island Logic Music System.

A list of all the tracks on each disc can be obtained by sending a stamped addressed envelope to Panda Discs, Four Seasons, Tinkers Lane, Brewood, Stafford, ST19 9DE..

## Graphics package enhanced

RENDER Bender II is the new graphics package from Clares (0606 48511) which includes a suite of four Archimedes programs for generating three dimensional ray-traced pictures and animations.

Building on the success of the original Render Bender, it includes many enhancements. It is fully Risc OS compliant and will even ray trace in multi-tasking mode.

And another major difference is that it is much easier to use than the original Render Bender thanks to Illuminator, a front end program

that lets you draw your scenes using a package similar to Draw.

Text can be added, objects animated manually and once scenes are defined, they can be taken into Render Bender to be ray traced and from there into the Animator package for animation.

Also included in Render Bender II is Converter which converts a compressed screen into a sprite file and allows the user to extract individual screens from an animation file.

Render Bender II costs £135.

## Files on show

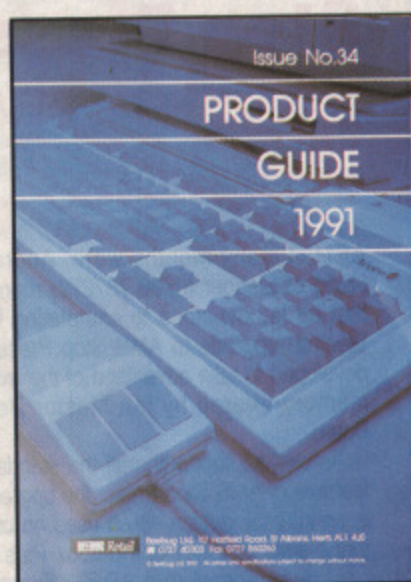
DESIGNED for use with any DTP or design work, !Glimpse is a new utility for BBC A3000 and Archimedes computers from Sherston Software (0666 840433) which displays miniature versions of all !Draw and sprite files within its own window.

Users can browse through and pick the one needed to load into any application. It also allows viewing of multiple sprites within a sprite file.

The price will be pitched at under £10.



# The Product Guide



Beebug have published a 72 page full colour A4 product guide for users of BBC, Master, A3000 and Archimedes computers. It contains information on thousands of products that are available now for your computer. Whichever system you use, you will find this illustrated and helpful guide to be an invaluable source of information. Everything is covered from complete systems right down to spare parts. As an added feature comparison charts for monitors and printers are provided along with compatibility and upgrade information.

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## More fun than school?

FOLLOWING the run-away success of Fun School 2, the chart-topping and award winning multi-format educational package, Europress Software (formerly Database Software) have released their new selection, Fun School 3, which is set to do even better with improved graphics speed, playability, sound and now full conformance to the National Curriculum.

The complete set is once again divided into three age groups with six programs in each level and the popular Fun School 2 characters.

For the Under 5's there's the Fun School Teddy featured in programs covering shape matching, actions, picture gallery, counting, matching letters and painting.

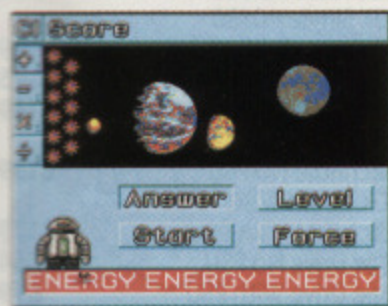
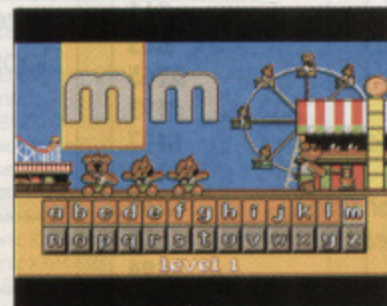
The 5 to 7's have Freddy the Frog in Journey which involves mapping and reading, Collect for sums, buying toys in the Toyshop, introduction to Electricity, a simple teletext-style database called FunText and a telling the time game.

The oldest age group, Over 7's,

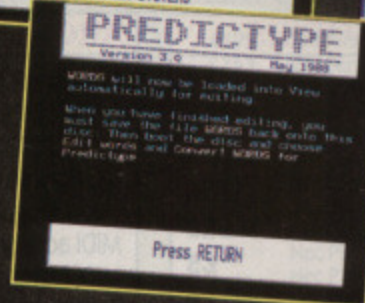
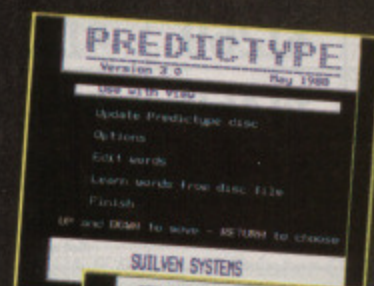


has the character Robbie the Robot in a word search program, a sort of Turtle Logo draw program, mental maths in Planetary Maths, directions and distances in Treasure Search, another Database with a built-in quiz system, and Sentences where children must correct errors.

Each set contains a high quality manual packed with notes on how to incorporate the software with other aspects of learning. Each set costs £24.99.



# FREEBIES



**T**HIS month it's the owners of the 8 bit BBC Micro that benefit from Scetlander, renowned for their high quality educational software, are giving away five copies each of their top-selling packages Predicttype and the Wordwise Plus Literacy Pack.

Predicttype 3 is a powerful tool for all keyboard users. Each time you start a new word Predicttype will offer you a selection of the most likely ones you intend to type – you just select the one you want. Predicttype increases both speed and, more importantly, accuracy when typing in text. But Predicttype doesn't just present a fixed selection of words, it learns as you type, and adjusts itself to your style so its guesses are more likely to be correct.

Predicttype 3 requires a 16k bank of sideways ram and will work with Wordwise, Wordwise Plus, View and Writer. Its usual price is £39.99.

The Wordwise Plus Literacy Pack is a completely integrated set of programs – written in the Wordwise Plus programming lan-

guage – and related materials that provide a unique interactive software package for literacy training.

Easy for both tutor and student, it provides practice for a wide range of literacy skills including spelling, comprehension, letter writing and filling in missing words. Many of the programs also offer feedback to show how the student is progressing.

The pack requires Wordwise Plus to be fitted in the machine it is used on, although the training materials are still largely valid and the text files are compatible with the original Wordwise. The complete set normally costs £48.99.

### What to do

Specify which product you would prefer – Predicttype 3 or Wordwise Plus Literacy Pack – and write to: Micro User Freebie Offer, Scetlander, 74 Victoria crescent Road, Glasgow G12 9JN.

Free copies of the packages will go to the first TEN readers whose names and addresses are pulled from the hat on September 22.



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A420/1 Learning Curve	<b>£1299</b>	<b>£1469</b>	<b>£1529</b>
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# THE MAD HATTER



**T**HIS is the final part of the solution to *Dennis through the Drinking Glass* and our hero finds sanctuary at last – after a number of vicissitudes. Try saying *that* when you're plastered.

We left Dennis at the Liberal Party Headquarters – in a phone box with Cyril Smith – so as a final charitable act he must feed Cyril and then shamble off north, west, north to the BBC Studios and Robin Day.

He must give Ken to Robin and then go northwest to Leon Brittan's cell. Here

he needs to take the key and then throw it away before going southeast to Shepherd's Bush for a well-earned drink. Now it's a question of heading west on to the M4 motorway and then south to Heathrow.

Here we catch the 747 and – goodness me – there's Norman Tebbit and a parachute on board: Eject Tebbit and you will find yourself in a hotspot and a fairly familiar situation.

East takes you to Saudi Arabia and a confrontation with a camel, Geoffrey Howe and your son Mark (where am I?) Thatcher. Stop Howe and you can

then safely ignore your filial favourite.

One move north takes you to the Vatican balcony and the Pope: If you know your good manners and kiss the ring you'll find yourself instantly transported to Paris. A move west brings you to Francis Mitterand, some French mustard and a CAP.

Have a drink to gather your strength and then take the mustard. Take the .Cap and rip it up – which is something our Minister of Agriculture should have done long ago – and go east to a Russian cell. Once the ticking has stopped, lift the bunk.

Now go down into the tunnel and wait to go to the bolt hole with the button. Go up to Michael Hesseline, give mole and receive a sovereign as a reward: Take it and have a drink.

Next go north to Trafalgar Square and then east to Bruce Kent. Give him the collar and take the CND badge in return. Now go northwest to Princess Di in the park and south to Macdonalds where Casper Weinberger is. Put mustard on Casper and go southwest to Shepherd's Bush, west to the M4 and have another drink.

Wear the badge and go west to Greenham Common, west again to

Plymouth: Ignore the dreamboat but take the key and then catch the boat to Northern Ireland.

Drop the badge here, and take the foghorn then go west to Ian Paisley. Give him the foghorn and have a drink. Now go south to Enoch Powell and the broken treaty. Give him the sovereign and you'll find yourself transported back to London by the banks of the Thames.

Take the raincoat and move southwest, north and east. Take the flag and go south to the hospital and Sir Keith Joseph. Go BUPA to the phonebox and dial 999 before having a medicinal drink.

Insert money to go to the cycleway then get on bike to find Nigel Lawson. Go for tax cuts, less, select Winchester, tip and revolution are the required input here, after which you won't be able to see the wood for the trees.

Wear the raincoat, enter Turns (to check how you are doing) have a drink and weave south to Mary Whitehouse and a blue film. Flash, drop raincoat, go east to General Galtieri, give him the flag, unlock the door to the Gravediggers' Arms and there you are. It's all over.

## Burgers, bikes and booze

### More dottiness with the Djinn and handy lung-fish

IN last month's look at **Adventure Quest** I left you in the wadi having filled your bottle with oil. We won't need it yet, in fact we have quite a bit of scurrying round to do before we make use of it – but if we forget it we shall come to a frustrating stop before too long.

It's time to go mountaineering again and this time, ignoring the sheep track, we go straight up. There's no need to worry about the body hanging on the gallows or the threatening notice: The Orcs have been dealt with.

Go north into the stone tower, east into the small room and take the rope, then go out again and climb the stairs until you come to the room with the foul smell. Once inside, don't panic. Throw the ruby – which turns out to be a bomb – and the Shape will no longer be able to do you any damage.

Take the emerald eye from the alcove, but leave the bag where it is for the present – you'll be coming back

this way soon. Now you need to go up to the place where the abominable snowman was chained up.

Leave the tower and go on up the mountain. When you are outside the cave, drop everything and go back down to the tower, collect the bag and take it down to the Wadi.

From here you need to go two moves west to the dry canyon and then south towards the oasis guarded by the Djinn. If you open the bag here a blast of wind will blow the Djinn away: It's a case of one windbag disposing of another.

One more move south places you right in the oasis, so have a drink and take the lamp. Now you'll be able to see what's in the cave, so scurry off back up the mountain, through the tower and up to the cave.

Enter the cave and light the lamp: You'll see a small stalagmite, yet another white dot, and you'll hear the sound of running water. It took me a

fair amount of puzzling before I worked out what to do here.

First, tie the rope to the stalagmite and then throw all the objects one by one – the lamp last of all. Make sure you collected everything outside the cave and that you are carrying nothing before entering Down. This will put you on to a ledge which then collapses, hurling you into the water.

Don't panic, enter Up instead. If you are told you can't, it's because you are still carrying something which you should drop – the game actually allows you to be carrying four objects and drop them before trouble occurs. Once you have climbed up successfully you are on another ledge and you should move east to where you will find a model of a lung-fish.

The lung-fish is a very important object and will be needed at several points in the adventure from now on. It's vital (literally) to realise how it works, though. It changes your capac-

ity to breathe in a particular medium the moment you pick it up.

Thus, if you pick it up while in an air-breathing environment you will at once get the message: *You can't breathe*. If you then drop it, you will still be unable to breathe in air until you have picked it up again. After that, if you are not going to change environments, it can be dropped again safely leaving your hands free to carry four objects.

So, take the lung-fish and go down into the water. Your next input should be up – and you'll find yourself on a beach, unable to breathe: So drop the lung-fish then take it again and your troubles will be over. You will also find that everything you threw into the water from the cave has been washed up on the beach – and there's a new item awaiting you, too, a fishing net. Its use will prove illuminating.

More next month.



## Elite Tips

Stephen Smith offers tips on getting rich quick – and getting killed even quicker if you don't watch your step.

Find somewhere with an Anarchy system within 0.5 lightyears hyperspace jump. Stephen uses Bianté and Erbieso in Galaxy 4. Here's the scam: Buy as many tons of Narcotics as you can from the non-Anarchy system – make up the load with Computers if needed. He's been able to get Narcotics for around Cr17 a ton at Bianté.

Now hyperspace to the Anarchy system – in this case Erbieso – where they sell well: Around Cr99 a ton is possible. Then it's just a question of battering your way through successive waves of hostiles until you collect the profits.

If the price is too low, simply hyperspace back to the stable system and then rejoin the Anarchy system immediately to see how prices are now. The point is, you can do the switch several times on one load of fuel until you decide the price is right.

This is not a tactic for wimps and Stephen is Elite now. Stephen has troubles, however, in Witch Space.

He gets thumped by Thargoids on a fairly regular basis. Does anybody have a set of tactics that works

every time? I just flail around with my Military Laser until they are all gone or I have been splatted myself.

Stephen also believes he's encountered the C and D ship – in the Anarchy system, naturally. There he was, just having dealt with an attack wave, his radar clear of baddies and debris, when something invisible mugs him and it's *Game Over* before he can draw breath.

I've had a letter from Stephen Hayes asking about second processors. The second processor required is the Acorn 6502 in its various guises. My own is external, but one can be fitted internally to a Master.

Not much software was written that followed Tube protocols, but Elite certainly was. My own disc (from Superior) caters for an unexpanded BBC Micro and also has versions for B+, Master and 6502 second processors.

I have had an absolutely massive missive from Daniel Doran who covers a number of topics – and I'll deal with the first one this month.

He's bought the game UIM (expensive and infuriating according to Daniel) and having completed the first two missions now gets plastered by the police no matter what he does or

where he goes. He wonders if it is a bug. I can't yet help personally – though a very kind reader has sent me his copy of the game to look at. I'm willing to act as a clearing house for any information you may have which will help Daniel. I'm still learning how to control the submarine. At the moment I keep burning up on re-entry.

James Turner has completed Mission One on his Master 128, and wonders what to do now. Press on, my son: Eventually you will be awarded Mission Two. James also asks if Mission One is rewarded in any way. I'm almost certain my bank balance was boosted by Cr10,000.

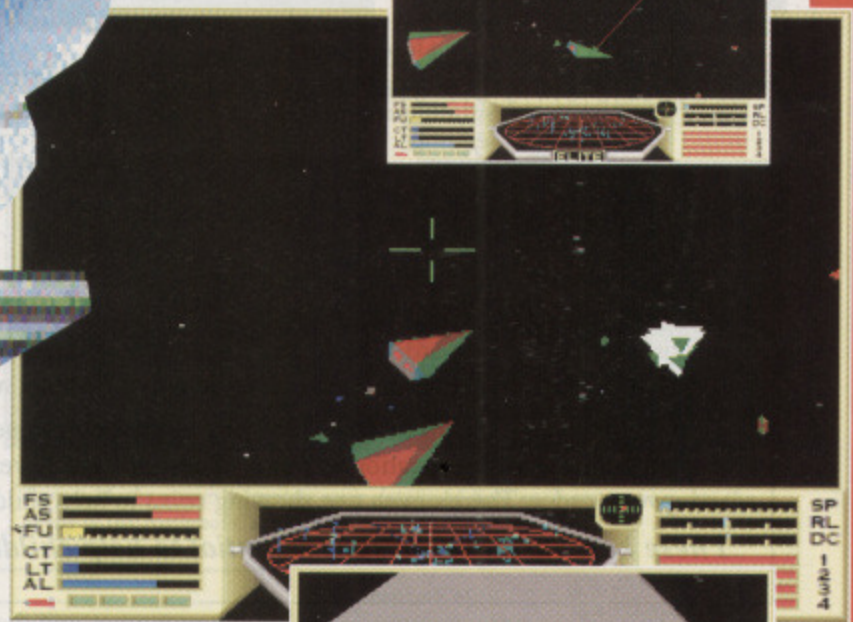
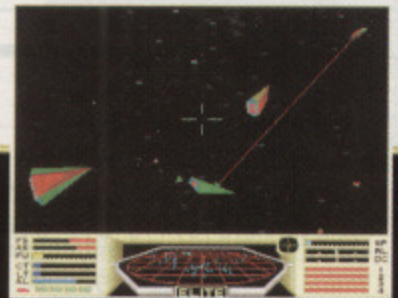
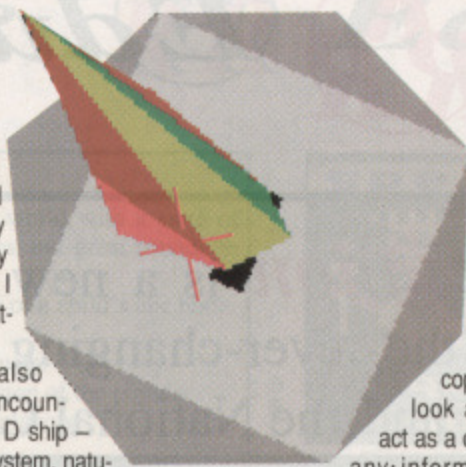
Commander V. Rogers has had trouble with *Elite* when he runs it with his Master Turbo board operating – the lasers fire all the time. He's had the hardware checked and that seems in order, so all I can suggest is that he contacts Superior Software. They have been very helpful to readers in the past.

## Problem Corner

Matthew Chatterley is stuck in the adventure game *Amnesia*. In spite of my vast stock of hints and solutions, I don't have anything on it. Matthew has four questions: Where does he dig the hole, what does he type into the computer, what does he do with the money and where does he apply the machete? If any reader can supply answers Matthew and I would both be grateful.


James Knott is a bloodthirsty lad who wants to blast Thargoids at will, rather than relying on the random precipitation into Witch Space. Well, James, on some versions you can do the following: Start the Hyperspace routine, pause the game once the countdown is under way, press Control+X, resume the countdown and it's Witch Space next stop.

By the time you read this, the Archimedes version should be near launch. It's brilliant: I've now seen what is termed a prototype version. Lick your lips lads and lasses, it won't be long.





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## Behind Triple Education

### Pete Davidson (Project Director)

Pete has a BSc(hons) in Mathematics and Computer Science and also has certificate of education. He has been involved in education all his working life and has taught in Primary and Secondary schools and also lectured at University.

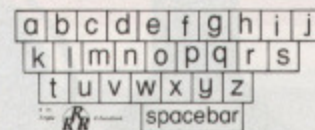
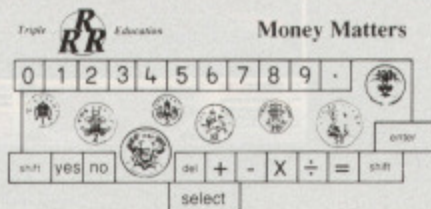
Over the past few years he has been involved in publishing magazines and software. He has been features editor of *The Micro User* and the world's first educational computer comic *Let's Compute!* He's also worked on many top educational software packages such as *Mini Office*, *Mini Office II*, and the award-winning *Fun School* series.

### Steve Botterill (Financial Director)

Steve is a well-known figure in the computer software industry. He helped to establish *Superior Software* as the leading games producer for the BBC and Electron from 1982 to 1988. More recently he set up *Impact Software* and now is co-director of *The Fourth Dimension* and *Triple R Education*.

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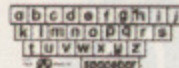
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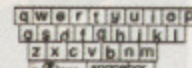
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A superb suite of programs to teach currency facts. Based on a circus theme it's ideal for all children from tots to teens. Youngsters will love the cheerful clown graphics and the unique coin keyboard overlay. This is the best way for children to learn all about British coins and ways of tendering sums of money.

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BBC/Electron tape.....12.95  
BBC 5 1/4" disc .....14.95

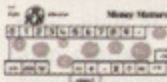
Master Compact 3 1/2" disc .....15.95  
BBC A3000/Archimedes disc .....19.95



BBC



ARCHIMEDES



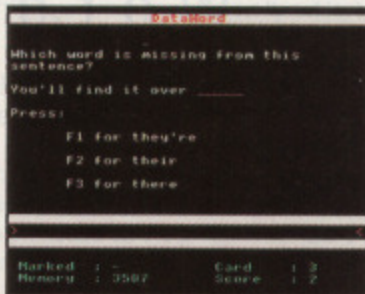
Money Matters comes complete with a keyboard overlay. Children can press pictures of coins rather than the computer keys

## DataWord

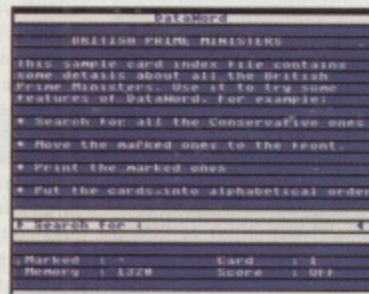
This unique program has been designed with ease of use as a priority and fulfills many of the needs for a database in the National Curriculum. It works just like a card index but the flexibility of the text editor allows you to also use DataWord as a word processor too! Another really powerful feature of Dataword is the built-in card linking system which means parents and teachers can create files of inter-connected cards. **THIS IS NOT JUST A DATABASE**, it's a word processor, quiz game, electronic programmed learning book and a fabulous introduction to the world of Information Technology.

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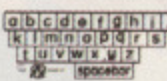
Master Compact 3 1/2" disc .....15.95  
BBC A3000/Archimedes disc .....19.95



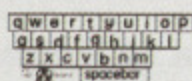
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ARCHIMEDES



Data Word comes complete with two of the revolutionary lower case keyboard overlays and FIVE fascinating example files.



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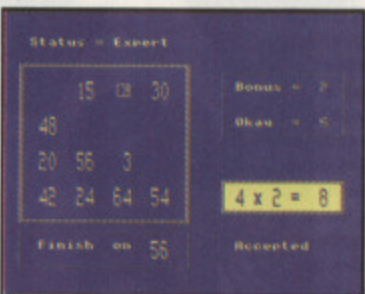
**NumberFax:** A unique game showing factors, odd and triangular numbers and more.

**Scale Factor:** Read linear scales exactly - and at higher levels improve your arithmetic skills too.

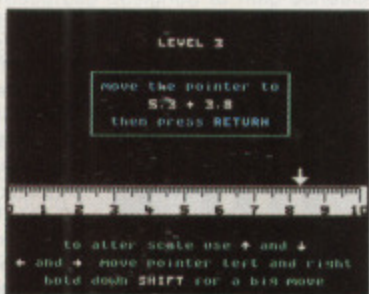
**Slider:** A computer version of Snakes and Ladders.

BBC/Electron tape.....12.95  
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Master Compact 3 1/2" disc .....15.95  
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Target Maths comes complete with details of how each program meets the needs of the National Curriculum

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Converta-Key comes complete with two of the revolutionary lower case keyboard overlays



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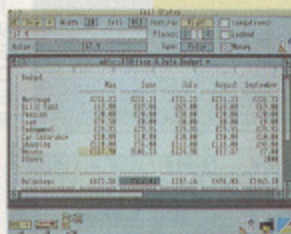
DeskTop Office is all you need for Education, Small Business or Home use.



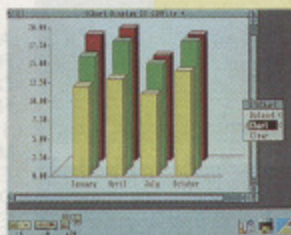
At last - a fully integrated suite of database, word - processor, spreadsheet, charts and communications for the Archimedes. The database is simple to set up with a flexible card layout enabling you to design cards to suit your data. Video style controls make it easy to browse through the records. With instant search on fields, sort routines and reports available, DTObase gives flexibility whilst remaining simple to use.



The word - processor, DTOWord is ideal for all types of correspondence, with the ability to change text to bold or condensed, indent, centre, justify etc. DTOWord makes every document look professional. Text can be any colour and even displayed in large characters on screen making this package ideal for young children or those with poor sight.



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The final package in the suite is the communications program DTComms. Multi-tasking, even on line, DTComms supports ANSI and TV1925 emulations and is configurable for all baud rates and protocols. Text files can easily be transmitted and received.

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## Young Press praised

WHILE thousands of athletes from around the world were striving for honours on field and track at the recent World Student Games in Sheffield, local children were also being praised for their achievements in the less active sphere of computers.

In a scheme designed to take advantage of this unique event, pupils from 30 Sheffield schools used the latest technology to produce daily news sheets throughout the two weeks of the games.

Using portable computers, teams of intrepid young newshounds from a different school each day, stalked the arenas, swimming pool and tracks to conduct interviews with competitors, compile reports on events and talk to visitors.

They even had the scoop of an interview with Neil Kinnock when he turned up at the games and such was their professionalism that they became known as *the young Press* and were accorded the same privileges as the professionals.

Their reports were sent via modems down the line to Sheffield Education Computer Centre from where the project was masterminded and where they were downloaded into Archimedes computers using Longman Logotron's communications software ArcComm2.

Files were saved and transported

to PenDown by Longman Logotron for editing by other students. The work was then exported to Acorn's Desktop Publisher where the final copy was typeset and the A3 news sheets were distributed to the various venues to give competitors, visitors and organisers a daily news service on the games.

"The atmosphere here was absolutely marvellous", said manager of the computer centre at Nether Edge, Dave Smith. "The children worked really hard not only through the two weeks but at weekends as well, backed by many of their teachers and also by staff at the centre including our advisory teachers Joan Craven, Marg Lester and Alison Tyldesley. It really made you think that life was worthwhile".

Planning started two years ago when Sheffield Education Department seconded teacher Paul Desgranges to look into the educational possibilities of the games and their accompanying cultural festival being held in Sheffield. At the same

time, staff at the computer centre also started to think how schools could become involved using computers.

Initially the centre produced a pack of curriculum activities which local schools used before and throughout the games.

Following the games news service, which included both junior and secondary school pupils, a booklet is to be produced on the project with plans for an introduction written by Neil

Kinnock.

Sheffield Education Computer Centre started eight years ago and is supported by Sheffield Education Authority.

# Update

## IT hot of the press

A NUMBER of new IT publications are now available from Northern Micromedia.

The MITAC (Management of Information Technology Across the Curriculum) project has launched a series of training materials and resources designed to help schools and colleges more effectively manage their use of IT.

Six titles are available. Some include simple software, all are activity-based and are well supported by comprehensive guides and background material.

Coach Lane Comprehensive is designed to raise awareness of IT issues in schools, encouraging management teams to look at IT in action in a fictitious secondary school. IT 1995 and The IT Toolkit build on this awareness and Making IT Happen offers a series of informative and interesting articles to help get the ball rolling.

The project's most recent resources have more definite focus. Exploring Roles and Responsibilities for IT helps clarify who should be doing what and The IT Development Framework is about working with teams to encourage and support the appropriate integration of IT into

## Hands-on at art show

WHEN children visit most art exhibitions, they are strictly instructed to keep their hands off. The opposite is the case with Art Machine, the revolutionary art exhibition which actively encourages participation by young visitors.

Nine A3 sized Concept keyboards have been a main attraction at Art Machine where youngsters are encouraged to push knobs and clamber through sculptures as well as creating their own art through using the keyboards.

Attached to BBC A3000 computers, the Concept keyboards are used with a range of software commissioned by Topologika and specifically designed to link maths with art.

Among the first participants in Art Machine were pupils from the Isle of Sheppey's Danley Middle School. Another group of young visitors who found the Concept Keyboards particularly interesting were those from the George Orwell School's department



for visually impaired children. Head of the department, David Arnold said: "The physical aspect of touching is very important to visually impaired children. Our group found the Concept Keyboards really fascinating because of the ease with which the children could create images on screen."

"The main learning difficult associated with visually impaired children is the time taken to complete a task. Reading and writing takes considerably longer for visually impaired chil-

dren and leaves them physically fatigued. "With their large, colourful overlays, Concept Keyboards are much easier for those with sight difficulties to operate".

Earlier this year, Art Machine was at London's Barbican Centre. In April next year, it re-opens at Blackpool's Winter Gardens. Such has been its success that later in 1992, it will go on show in Amsterdam and at other venues in Denmark, Sweden, Belgium, Germany and Spain.





existing programmes of work.

The second set of literature has been produced by a NCET/NORIC Maths, IT and Special Needs project and is a range of materials on how IT can support mathematics learning for special needs children from nine to 13.

It covers National Curriculum attainment targets and makes extensive use of a great deal of software which is available in schools including Logo, Grass and Ergo. The materials combine practical problem solving and investigational activities with the facility of IT to provide an "alternative, stimulating and non-threatening learning environment".

Among various aspects of the maths curriculum dealt with are pattern in number, data handling, shape and symmetry, Logo and Roamer work.

The various titles can be bought individually or in packs. For further details contact Northern Micromedia, Resources Centre, Coach Lane Campus, Coach Lane, Newcastle upon Tyne, NE7 7XA. Tel: 091-270 0424.

## Special Needs Open Day

IF you're quick off the mark reading this latest copy of *The Micro User* you may just be in time to attend the Special Needs Open Day to be held by Morley Electronics on September 17.

It aims to offer useful information to people involved in special needs education and to give them a chance to see at first hand some of the hardware and software now available for people with special learning needs who use Acorn computers.

A number of specialist software houses will be exhibiting their products and there will be demonstrations of the Acorn Special Access Pack by representatives from Acorn.

More details from Michael Fodden, Morley Electronics, Morley House, West Chirton, North Shields, Tyne & Wear. Tel: 091-257 6355.

## 32-bit technical support

CONCENTRATING on BBC A3000 and Archimedes machines, a new company Selective Computer Services

has been set up to serve people in Derbyshire, Leicestershire, Nottinghamshire and Staffordshire.

Running the firm is Barry Thompson who recently took early retirement after 19 years in further education where his special emphasis was on teaching computer skills.

"I aim to provide for all the needs of the home, school and small business computer user, including technical support and servicing", said Barry. "The main aim of the business is to sell and support computers which will help build the confidence of users so that they will not feel afraid of using new technology".

Barry intends to deal in the BBC A3000 Special Access Computer, to offer technical support in schools, colleges and homes and to provide home tuition. He can be contacted on 0332 690691

## Longman on the move

EDUCATIONAL software house Longman Logotron has moved. It is now at 124 Cambridge Science Park, Milton Road, Cambridge, CB4 4ZS. Tel: 0223 425558. Fax: 0223 425349.

## Latest packs from ESM

ALREADY making plans for its appearance at next year's BETT show in January, educational software publisher ESM has announced a number of new products.

Most likely to become available first are Archimedes versions of ESM's popular Best Four Packs. In response to demands from teachers, the Best Four Language and Best Four Maths packs should be out at the end of September in Archimedes format.

Not surprisingly, both packs contain four programs and are good value for money. ESM will also launch a new Archimedes pack called Best Four Adventure including four of the popular Anita Straker adventure programs - The Lost Frog, Puff, Martello Tower and Merlin's Castle.

Aiming for the Christmas trade is the first of a series of support packs which have been developed to expand the possibilities of ESM's popular wordprocessor, desktop and interactive publishing package Desktop Folio.

Due out soon, it's the Christmas Theme Pack and contains a wealth of design ideas for Christmas cards, posters, pantomime programmes, festive menus and advent calendars. Included are many ready-to-use pictures and page designs as well as a Practical Ideas booklet. Other theme packs will follow.

Aimed at a January release is an Archimedes version of the popular BBC geography pack World Map Study which includes excellent graphics, greater versatility and more information than its predecessor.

A map-based database for storing and manipulating a range of geographical and environmental details, it will present data visually in a number of ways including bar charts, scatter-graphs or coloured maps. All data can be updated allowing World Map Study to become an ongoing source of information for any project.

Rounding off ESM's latest announcements and also due for release in January is Bookstore, an Archimedes database program which encourages children to record and retrieve book reviews they have written.

With Bookstore, teachers can keep a record of what each child is reading and young readers have an easily accessible source of book titles.

For further details on new products and on pricing, ESM can be contacted on 0223 65445.

## New Risc OS titles

TWO new Risc OS educational titles have been produced for Archimedes and BBC A3000 machines by Sherston Software (0666 840433).

Described as a simple but powerful information handling package, !Hilghter allows children and adults to create and link pages of graphics and text together in a way that is as simple as using a highlighter pen.

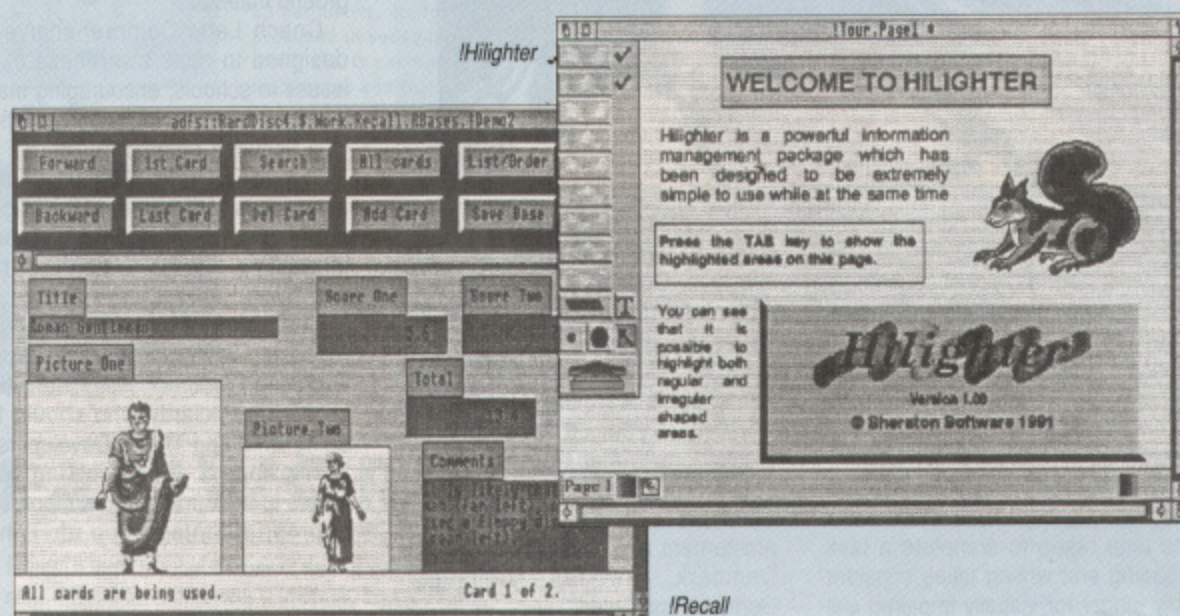
"The package comes with several

different Hilghter folders to illustrate its potential and has a multitude of possible uses both at school and in the home", said Sherston's Bill Bonham.

Second Sherston offering is !Recall, a new database package which has been designed to make it easy enough for children to use while retaining enough power for the majority of applications.

Special features include easy-to-design record sheets which will handle !Draw and sprite files, pictorial representation of searches, sum fields that allow the package to be used like a mini spreadsheet and full graphing facilities.

As *The Micro User* went to press, prices are not fixed but were likely to be under the £50 mark.





# fun school

# 3

## Learning is now even more fun!

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

On sale at top dealers nationwide. Selected formats available at larger branches of WH Smith and Boots.



**Under 5s**



Count up to nine to help teddy get the honey



Pair the large letters at the alphabet fair



**5 to 7s**



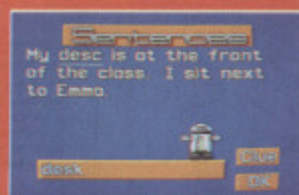
Tell the time and watch the clock come alive!



Guide the frog from log to log to solve the sums



**Over 7s**



Correct spelling, grammar and punctuation mistakes



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PC 5.25"		5891		5892		5893
PC 3.5"		5894		5895		5896
Amstrad PCW		5211		5212		5213
Spectrum	9084	9085	9086	9087	9088	9089
Commodore 64	9076	9077	9078	9079	9080	9081
Amstrad CPC	6189	6190	6191	6192	6193	6194

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DATABASE EDUCATIONAL SOFTWARE





**Product:** Map-It  
**Price:** £32.00  
**Supplier:** FM Associates, 40 Hylton Road, Newton Hall, Durham DH1 5LS.  
**Tel:** 091-384 1874  
**Requirements:** A3000 and Archimedes series

**L**ET'S talk about hypermedia, the system of organising information so that you can discover – and sometimes create – linkages between different bits of the information.

The best version of this type of package for the Archimedes so far is Genesis – presenting you with pages containing text, graphics – and potentially sound and video. Genesis uses buttons to take you to other pages.

Sometimes they are little blocks that advise of *More*, or take users to a menu. Sometimes they are hidden behind the content so that clicking on a picture of a bird reveals a page about it.

What is so powerful and exciting about this kind of system is that it allows the exploration of a body of knowledge in a free-form and creative way.

!MapIT is a Genesis II application that provides the National Curriculum IT document, its Attainment Targets and programs of study plus a certain amount of curricular analysis in the

hypermedia form.

You'll need at least 2Mb of ram, but you don't need a copy of Genesis as the !Browser application is provided. First the browser is loaded, followed – with considerably more disc swapping than the instructions suggest – the !MapIT file.

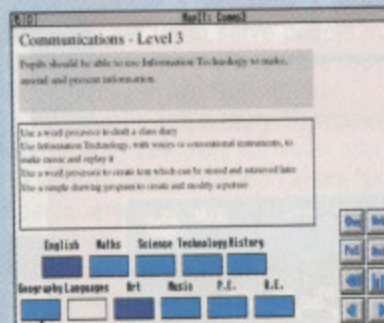
Clicking on Introduction takes you through some basic and important pages on the thinking behind IT in education. The idea of cross-curricular competence is introduced and it's this area with which the package is concerned.

In this form IT is divided into five strands: Communications, information handling, modelling, measurement and control plus applications and effects. The following pages give a clear view of IT in schools and will help sort out any confusion.

It breaks the problem down into its constituent parts and ends up by warning that MapIT is not a package for the IT coordinator or even the IT department, but something to guide a whole school policy.

I must say that the inclusion of this text as part of the actual package was a bit belt and braces. The text cannot be explored and the only relevant options on each page are: Next page, previous page and main menu.

It soon becomes clear that Genesis takes a while to load the fonts for each page – it gets really dull waiting for it. I would have preferred to see this printed out in a



Linking ATs across the curriculum

booklet. Hard disc users will not experience the same delays though.

The main menu offers each of the 11 areas the National Curriculum will eventually cover. So clicking on Geography and then waiting for half a minute will result in a very useful grid.

There's one for each subject covering each AT level crossed with each of the five strands identified above. The grid is shaded so you can see that while they would expect a high IT content in level 4/communications you wouldn't anticipate any level 3/modelling.

This is great because it immediately sends users to those parts of the curriculum where they can use IT and avoids unnecessary searching. It should be remembered though, that these shadings represent the authors' opinion and not explicit statements from the National Curriculum.

The key button always gives a guide to the meanings of whatever

graphical information is available and the help button indicates what all the other buttons do.

The graph button at this point – after you swap discs – shows the percentage contribution Geography can make to IT capability. This is a rather strange idea. Quite where such specific figures come from isn't clear, but again it can be a helpful guide.

From the grid page we can move sideways to another subject or choose to examine one point on the grid. Picking out communication in level four, I expected to find those Geography ATs that related to IT communications. Actually geography had been left behind and here is level 4 for AT 5 in the technology document, the communications bit.

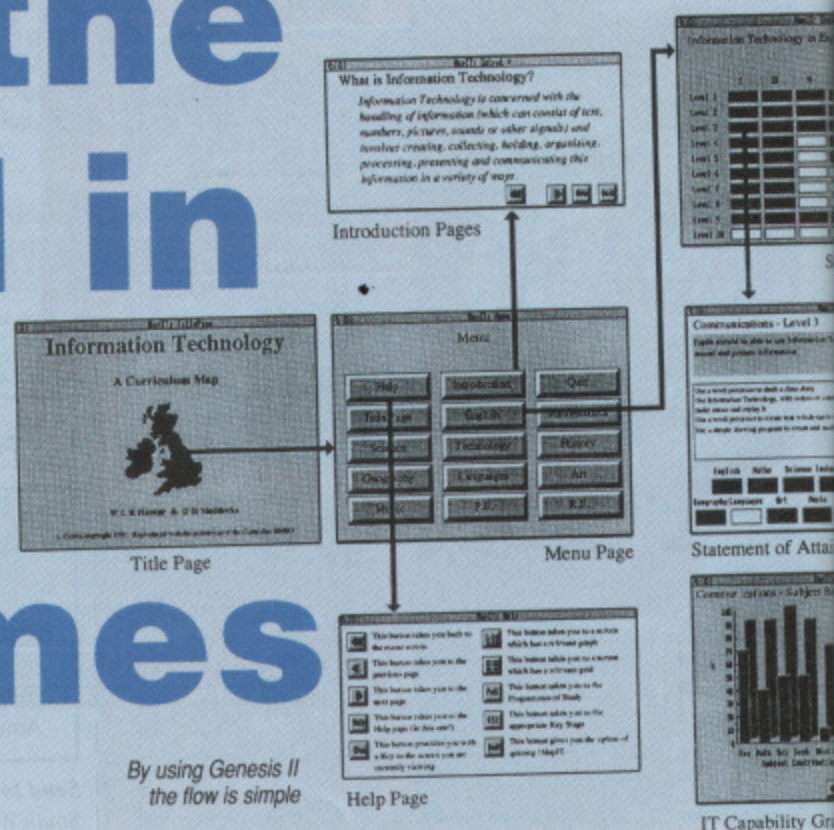
There are suggestions for specific activities, like restructuring a story by moving and formatting text. Whether these activities come from any National Curriculum documents is not clear, but considering that this was a recommended area for geography, there's no specifically geographical task on the screen.

We can now move on to the Programs of Study, choosing from the four key stages. The text is from the Technology document and does the relevant cross-referencing for you. It's also possible to look at grids and graphs which summarise the stands by subject, the opposite to the above.

There's no doubt that there is a genuine attempt here to be cross-curricular. There are problems, though. It

# Around the IT world in 80 frames

*Marshal Anderson examines a new hypermedia application to aid the harassed IT teacher*



By using Genesis II  
the flow is simple



# Discovering the hedgerows

**Product:** Hedgerows  
**Price:** £19.67  
**Supplier:** MEP, 8-10 Lower James Street, London W1R 3PL.  
**Tel:** 071-287 5060  
**Requirements:** BBC B and Master

*Donning his pith helmet, Marshal Anderson takes his class on safari*

is maybe too much to expect the resolution of the software to give you actual ATs and activities in individual subject areas, but you are left with a fair old search though the documents to find actual activities. That said, it's better than starting from scratch!

Some of the links between pages are not what you'd expect and it's not always easy to get back to a specific page. The software is very slow and a little more information on how to use the I!Browser would have been useful. Some menu options aren't explained, and there is a difference between clicking a button with select or adjust. However, my copy of I!MapIT is not quite finished, and these quirks should be cleared up in the final version

## Summing up

This is an interesting package offering a lot to schools – especially secondary – who are in the process of sorting out their IT policy. It will help sort out some starting points for discussion and development, directing coordinators to the relevant parts of the National Curriculum. It is still only a glimpse, though, of how hypermedia could help us through this maze..

DO like a software package with a lot in it and if quantity is your only criterion then Hedgerows will certainly impress. Running on a BBC Micro, the package aims to provide the IT view of a hedgerow study at a range of age and ability levels.

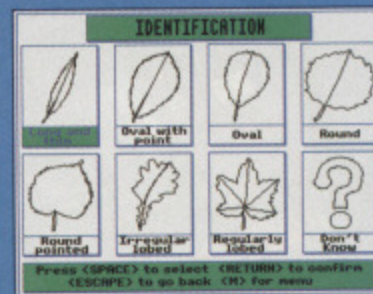
The first thing you come across is the identification screen. The idea is that you bring samples of leaves and twigs back to the classroom and the program steps through a series of questions from the shape and arrangement of the leaves to general queries about the plant.

The leaf shapes are illustrated onscreen so there is less confusion about what can be difficult choices to make. However, the database only contains a couple of dozen plants and the variety in any hedgerow runs into hundreds – but at least it is a start.

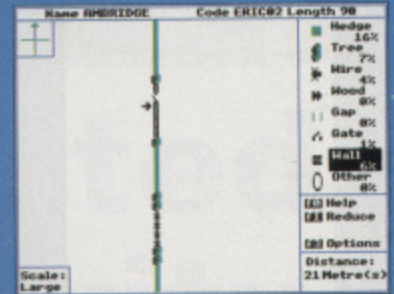
The program reports if it can't match your description. Once the software has an answer it will display a line drawing of the relevant leaf with various notes.

The other major section of the package is Field Work, which takes analysis of a hedgerow to a much more sophisticated level. To use this you'll need to go through the program before setting off into the field to ascertain what sort of information you'll be looking for.

The Hedge Survey has you setting up a section of hedge from 1 to 99 metres long. The package saves the



Stepping through the identification



Specifying your particular hedge

hedge's location and grid reference, its orientation and altitude plus an identification code.

Once this is all in a dotted line appears representing the hedge on to which the features surveyed can be placed. Available are things like hedge, gap, tree and fence, each represented graphically on the map.

The cursor keys are used to build up a plan of the hedge with a continuing display of the percentage each type of feature represents. At any point you can enlarge the map or get a printout. The hedge can be divided into sample points that take in its height and width to provide statistics used later. Once the dimensions are entered you can add the species found at that point. Again you are limited to the species offered or "other", but plants seem to have been carefully chosen as the main constituent parts of any hedge.

A further option is to date the hedge, using information on the types of plants there. You are warned that this is only an estimation, yet the age can be reported as 573 years – very strange. If these figures were rounded to the nearest 50 years and given the caveat "about" the message would be better.

The other main option available is the Detailed Study, which looks at the hedge from the point of view of its various microclimates. Here information about the wind speed, air, ground and soil temperatures as well as soil moisture at different points can be entered.

After entering all the required data it can be represented as a series of simple graphs and compared with other

hedges. As there can be a huge amount of data here the printout option is very useful.

All files saved in the Hedge Survey are compatible with the Key database. Two files are created, the basic hedge survey data and the detailed data. This really does give the power to study in great depth just what is going on.

Given all these facilities, the package presents a wealth of possibilities for class and field work. With packages like this though, there is always a danger that the software may end up dictating the form of the survey.

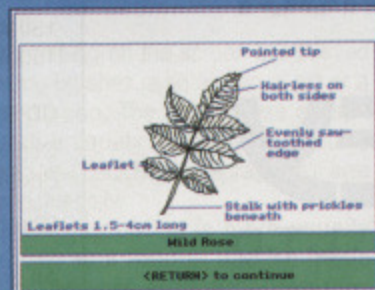
However, this is a versatile and useful package. My only real complaint is that the error trapping is poor to non-existent, so you'll have to be careful swapping discs and so on. It's also worth noting that the Hedge Survey needs a double disc drive to be usable.

The documentation is clear and concise with suggestions for activities. Further help is available in the form of a Hedgerows Activity Pack with a teacher's guide, worksheets and the usual bits and pieces.

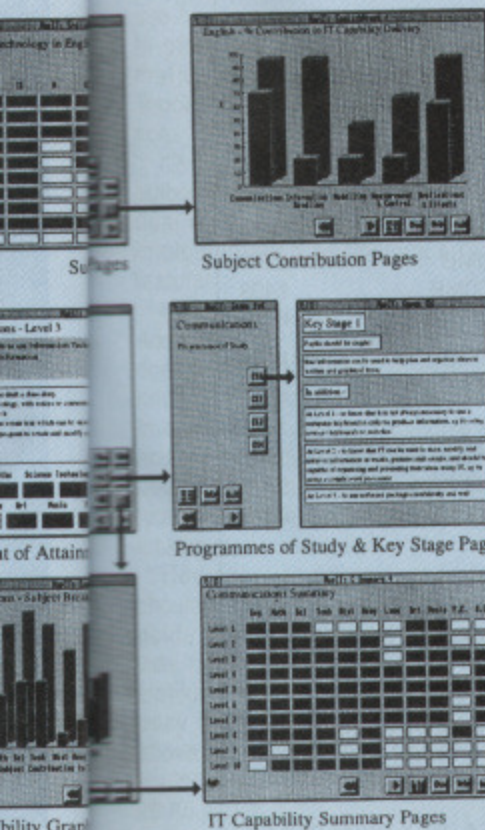
There are also programs to help users identify trees and wild flowers, all very reasonably priced.

## Summing up

This straightforward package is simple to use and well documented. It'll help expand the work you do on any field trip, from the junior age range using it to identify plants up to the upper secondary years using sophisticated statistical techniques.

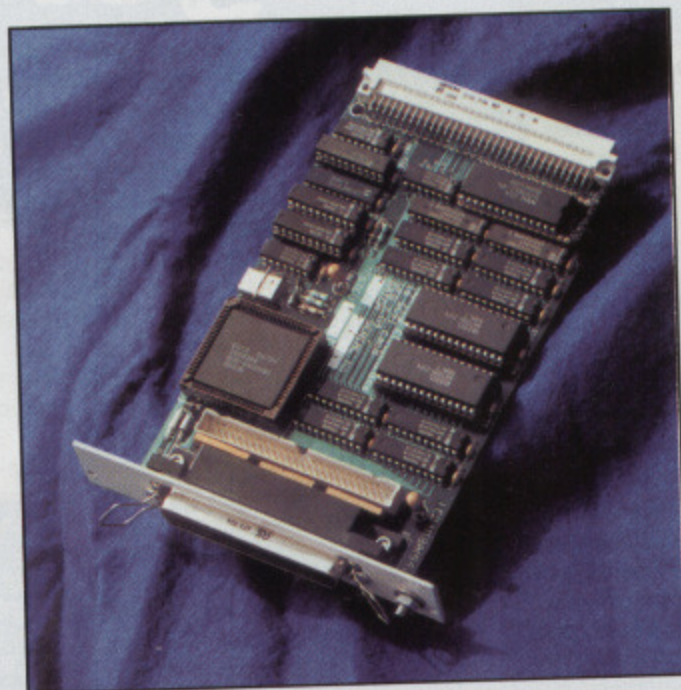


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Product: Imagine  
Price: £39.95  
Supplier: Topologika, PO Box 39,  
Stilton, Peterborough PE7 3RL.  
Tel: 0733 244682  
Requirements: BBC A3000 and  
Archimedes range

**I**MAGINE is described, on the front of its bright, distinctive packaging, as an easy-to-use design package for the Archimedes. When it arrived for review the rest of the family smiled – they've seen my art work. If I could produce something worth looking at then anyone could.

Well I did, and Imagine is so good that I believe that it could well become the default art package in schools.

For pupils of both junior and secondary school age its ease of use, range of features and price put other similar packages into the shade.

The sensible system of copyright protection is also encouraging. There are no dongles or key discs to be carried around or lost but the program does announce its serial number and the name of its registered owner in a pop up window when the program is first started.

It is something which potential thieves cannot ignore but which is not too inconvenient for the genuine owner.

Topologika's attitude towards backups is similarly helpful. They say that they expect users to make backup copies for daily use and that a purchasing institution such as a school may make any number of copies for use on a single site of that institution. In other words, they grant an automatic site licence. Well done Topologika. Other companies please note.

It's obvious from the very start that author Peter Killworth has put a great deal of thought into the design and implementation of Imagine's many features.

It does not conform entirely to Acorn's design guidelines, but neither does Impression, and I think everyone knows how good that program is. Imagine has a strongly intuitive feel and, as I quickly discovered, it can be used by anyone with experience of typical Archimedes software without looking at the user guide.

However, deciding that I really should stop doodling and that the user guide deserved at least a glance, I was treated to a pleasant surprise. Unlike many guides, this one was easy to read, friendly in style and, above all, informative. Everything you could wish to know is in there in only 28 A5 pages.

Possible pitfalls are described and ways of avoiding them are suggested. Even reasons for why the program does things in the way it does are given.

The program runs in Mode 15 and can use either 256 or 16 colours to paint across the entire screen area. An unusual feature is the ability to work on a second screen completely independently of the first. It may also be used as a temporary storage or trial area.

For these reasons the program does not multi-task, as there is simply not enough memory on a standard 1Mb machine. The non multi-tasking nature of newly released programs is the subject of some debate, but I don't think that it is an issue here. The gains far outweigh any losses and only when all Archimedes are supplied with 2Mb as standard could there be reason for a re-think.

Creating screens is achieved through a series of menus. The main one is displayed automatically when the program is loaded and from this a series of sub-menus may be accessed by clicking on the desired option.

This is not the standard Risc OS way to access sub-menus and it does involve a lot more clicking. I'm not happy with this for good reasons. Young children, for example, can find sliding the pointer off arrows on menus quite tricky.

On the other hand I like the menus' intelligent nature. They pop up away from the area which is being worked on and remember your previous choice. The next time a menu is selected your previous choice appears already highlighted and ready to be selected again.

When you have finished with a menu the mouse pointer is returned to where you were previously working.

Choices on the menus can be amended to suit the user. Some features may be disabled and others altered and help can be tailored to meet individual needs. Providing assistance in concise and informative boxes, you can set this to appear every time a menu is selected or where and when you deem it important.

Painting on the screen is achieved using brushes, a spray can, a jug or a magic pen. The brushes are chosen from a variety of shapes and sizes with you deciding the spray can's size and intensity.

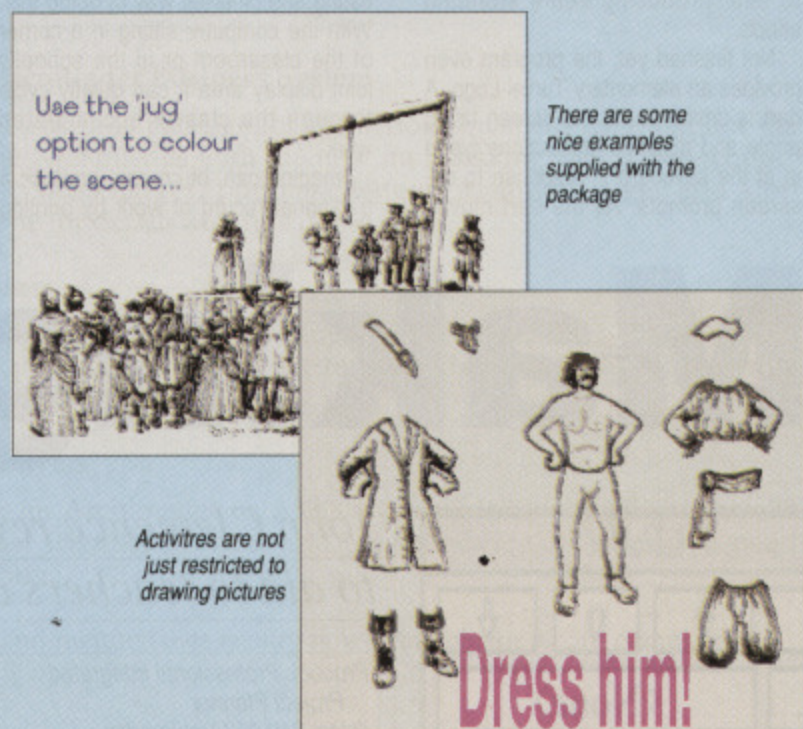
The jug option is more usually known as a flood fill and the magic pen produces some very interesting effects – click select anywhere on the screen and again a short distance



Imagine has a good user interface

# Unlimited creativity?

*Discarding his easel, Frank Jukes reviews a promising new paint package*



away and the colours lying along the line between the two points form a pattern which can be painted onto the screen to produce a ribbon-like effect.

In a similar way a small area of the screen may be used instead of one of the colours. Known as a texture, this pattern can be painted on to the screen with one of the standard brushes to produce an interesting background. As with most of the

other options, if you don't like the effect a click of the adjust button will restore the screen to its previous state. In a similar way the whole screen can be automatically covered in a series of rectangular patterns to produce an effect similar to brickwork – you can't reverse this option though.

All of these direct painting methods





may be enhanced by a whole range of additional facilities, all of which are available from menus. Some of the extras are simple and what you might well expect and others are more powerful.

Regular shapes such as rectangles, circles and even spirals are easily drawn, while you can place text anywhere and at virtually any size – as long as you have system or outline fonts.

In the more powerful options the transform option allows a rectangular area of the screen to be selected and then transformed or distorted. An area of the screen is selected using the mouse and then painted back in another position after being flipped, rotated or distorted to fit into a quadrilateral of your choosing.

To make all of these processes easier the program reduces the mouse's speed. Unfortunately it's not restored to its previous speed when the program is exited.

Imagine is not just an art and design tool. It has features which extend its use into mathematics. Tessellation and painting in a variety of symmetries – left/right, up/down or even 8-fold rotational – are both possible and easy to use, producing some stunning effects.

Not finished yet, the program even provides an elementary Turtle Logo. A dart is driven round the screen using angle and distance instructions typed in at the keyboard in response to on-screen prompts. As the dart moves

around the screen it draws a line which may be solid, dotted, dashed or brush shaped. The usual FD 20 or LT 90 type of command used in full blown Logo packages is not used and so this part of the package should really be viewed as an extra rather than a serious Logo implementation.

It is nevertheless a useful addition, and could be useful in integrating logo into the design curriculum.

The ability to save and later re-load recently created work is, of course, crucial and like the rest of the program it's quick, easy and menu driven.

Screens may be saved as standard screen sprites or in a compressed form onto discs known as gallery discs. These are ordinary discs with a Gallery directory where the screens are saved.

If the program finds that the directory doesn't exist it will create it automatically after first checking with you. This seems an unnecessary complication, but it does ensure tidiness and enables another program called Gallery – supplied with Imagine – to replay a collection of pictures as a slide show.

Displaying children's work is vitally important in motivating them, recording their achievements and in encouraging development.

Gallery's slide show offers an interesting and different way of doing this. With the computer sitting in a corner of the classroom or in the school's joint display area it can quietly cycle through the class's accumulated work.

Imagine can, of course, produce a traditional record of work by printing



Imagine makes the most of your talents

the screens. It does this using the appropriate printer driver which it reminds you to load if it isn't present when the program is first loaded.

The printing process is not without problems though. The first involves the second drawing screen. Memory limitations mean that this must be discarded or saved before printing, and this can be mildly annoying.

The second problem may involve the loss of unsaved work. If the printing option is chosen and the printer is not switched on the user is prompted to turn it on.

This on-screen warning could be missed or ignored by someone in a hurry and once the program tries to start printing there is no simple way to stop it. It would be useful if Escape, for example, aborted the printing process. The ability to stop printing

would also be useful when a mistake is spotted only when the printer has started.

However, one nice feature is the ability to select and print only that part of the screen you want.

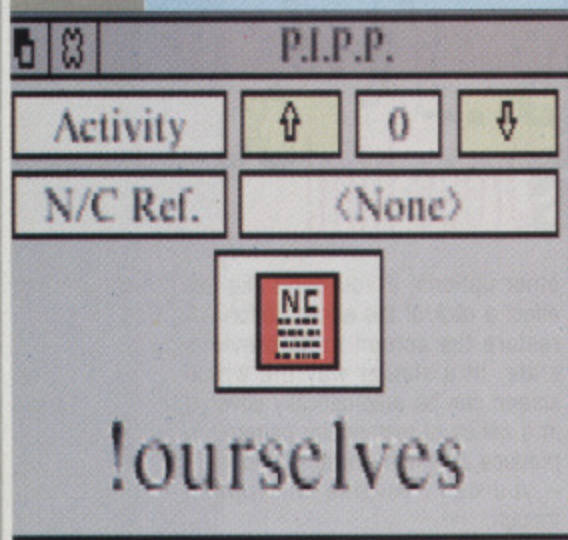
### Summing up

Imagine is very impressive, powerful yet quick and easy to learn. I cannot think of any missing features, and the guide is helpful and encouraging. The licence conditions and protection system are friendly and sensible and the price is right.

If your school is in need of a painting package then go ahead and buy this one.

# Making plans

*John Clemence reviews an updated version of a program to aid to teachers at the lesson planning stage*



The opening window of a loaded project

**Product:** Professional Integrated Project Planner  
**Price:** £42.00 (Archimedes – Primary Schools), £43.00 (BBC B and Master – Primary Schools), £52.00 (PIPP 2 Archimedes – Primary and Secondary), £15.00 (Archimedes – Homes)  
**Supplier:** CIS, Unit 2a, 436 Essex Road, London N1 3QP.  
**Tel:** 071-226 3340  
**Requirements:** BBC B and Master and A3000 and Archimedes series

**P**.I.P.P. is designed to help teachers plan their topic or project work while taking into account the requirements of the National Curriculum and works by allowing the teacher to have access through the computer to the statements of attainment.

These are combined with notes describing the associated activities which the children will carry out. The activities are devised and written by the teacher and the program is designed to help in the organisation of

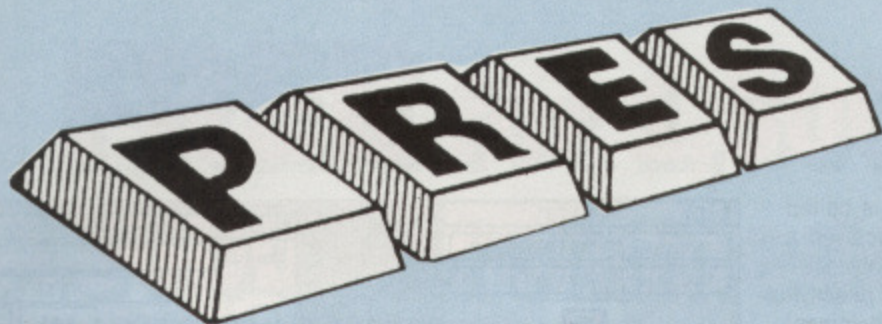
the ideas and for searching the National Curriculum statements for relevant references.

This information is stored on disc and as a project is planned you can either print the activities alone or complete with the attainment targets covered.

Since I first reviewed the program a little over a year ago it has undergone considerable changes and is now fully Risc OS multi-tasking.

There is a version covering Key





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Stages 1 and 2 and a fuller, more expensive one containing the complete National Curriculum which is designed more for secondary schools.

According to which version you buy, the resources disc holds part of or the entire National Curriculum published to date including the History and Geography statements but not the revised Maths or Science documents.

Except for History, where the example statements have also been included, this version of the program does not include the programs of study or the non-statutory guidance. However, these should be available in due course.

C.I.S. will also supply replacement files for the National Curriculum as final versions of the documents become available. A recording package is also planned which will enable you use the matched statements for your activities and attribute them to groups of children who have carried out the project.

The program relies on !Edit from the application discs in order to enter and edit text, so you may have to learn two new packages in order to gain the maximum benefit from using P.I.P.P. On the whole I liked the idea of incorporating the use of a program that was already available to all users of the machine – it makes good economic sense.

P.I.P.P. was supplied on two discs with a draft copy of the manual. One disc contained the essential resources while the other held an example file.

The program can be run in a 1Mb machine but you would then probably need to place projects you were building on the same disc as the Resources. I used a 2Mb A3000 with an additional disc drive with no difficulties, although I noted that both disc drives were quite active.

Care has to be taken with the order in which loading operations are carried out as P.I.P.P. has a sub-directory containing the font it uses. So it is important to load P.I.P.P. before !Edit otherwise you'll be given misleading error messages. Using two drives I found the best solution was to have a copy of !Edit – and the System Directory – on the same disc as the Resources.

Once loaded, the application appears at the bottom of the screen with a caption saying Inactive. A project may be loaded by double clicking on it in a directory window. Ready made projects are available.

The example project file is called *Ourselves* and I've also received a further project disc called *Homes*.

Both consist of a number of activities covering a range of attainment targets. Because of the open ended way in which the program is constructed it's quite possible to develop these ideas further in any way that you think suitable.

However, I could find no way with the current version of P.I.P.P. of being able to get an overview of what statements had been covered by a project. It is easy to list the statements for each activity but not the complete set for an entire project.

It would also seem that working out the statements of attainment for two or more projects would be impossible. It was also annoying not to be able to find any quick way of finding out how many activities had been planned. A lesser niggle was that I found the screen rather cluttered from time to time.

As well as providing the luxury of having the whole National Curriculum at your finger tips, P.I.P.P. can carry out quite powerful searches of the entire text. I used the package to prepare a project on Light and Colour. Within 65 seconds it had searched the whole of the National Curriculum for references to the word colour.

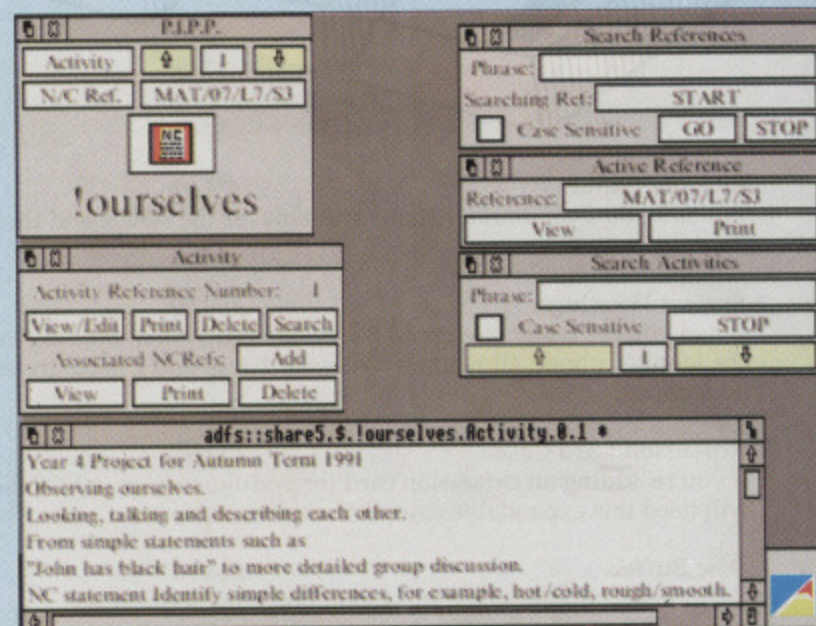
All of the National Curriculum references found in a search can be printed so that as you plan your activities it is very easy to find the references and attach them to each activity. The draft manual contained the beginnings of a tutorial.

Printing can be carried out in two stages – either the activity or the statements of attainment. However, there is nothing to stop you placing the National Curriculum statements into your project plans using the mark and copy facilities built into !Edit and then printing the whole thing in one go. The printed quality is quite basic but fast and is really all that is required.

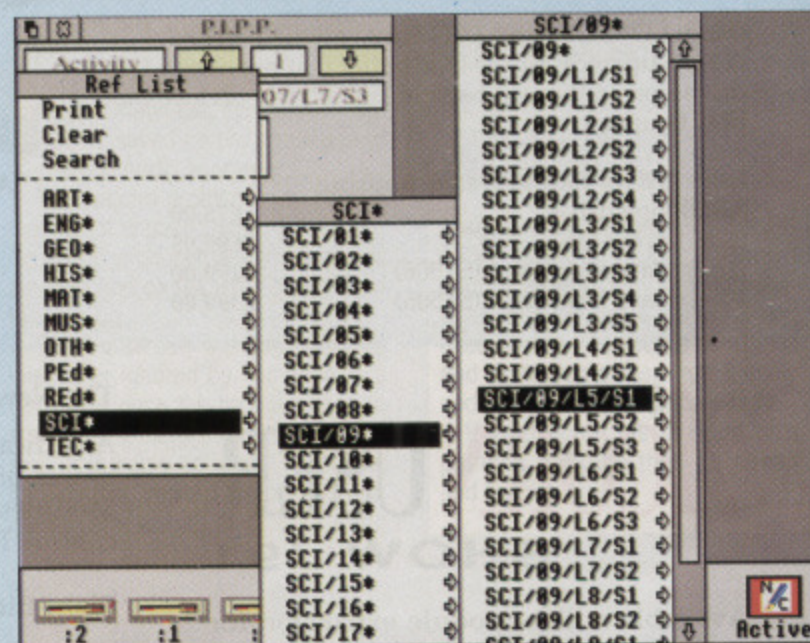
### Summing up

I began to find my way around P.I.P.P. quite quickly and despite some small reservations found it to be useful in planning one of my projects for next term.

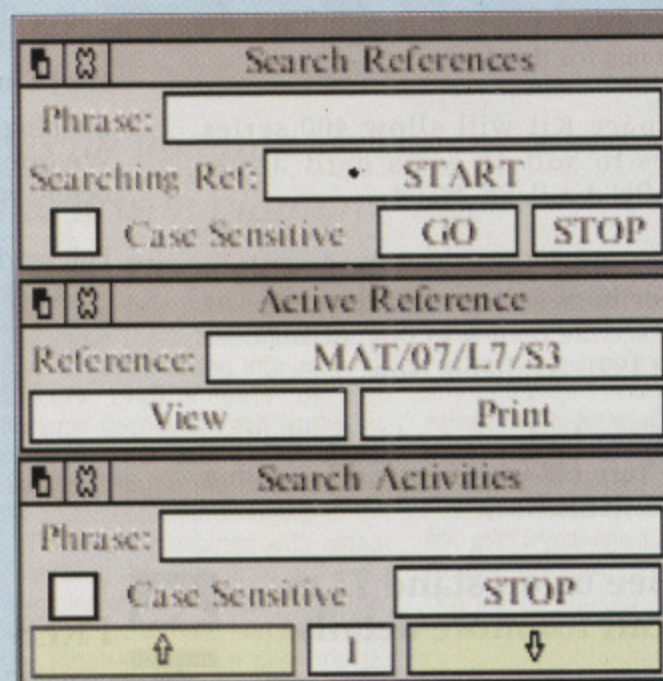
It invites a cross curricular approach to planning but provides no facility to draw a flow chart or conceptual map of a project showing all the links to different areas of the curriculum.



A typical planning screen



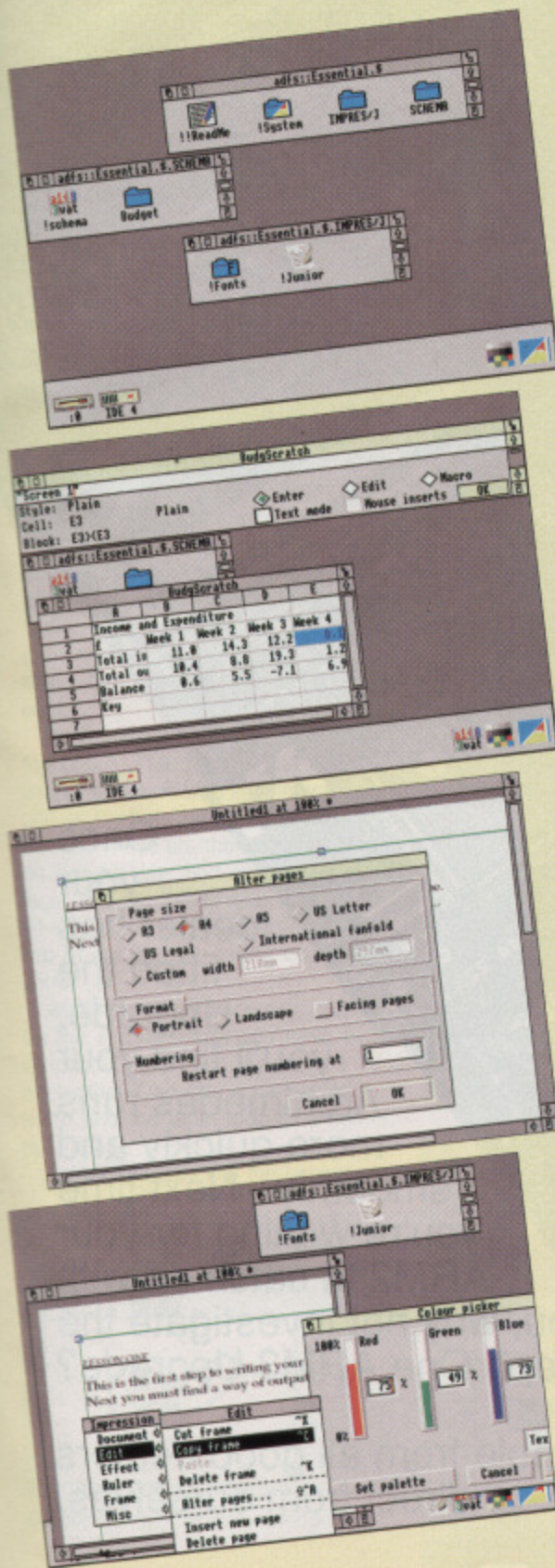
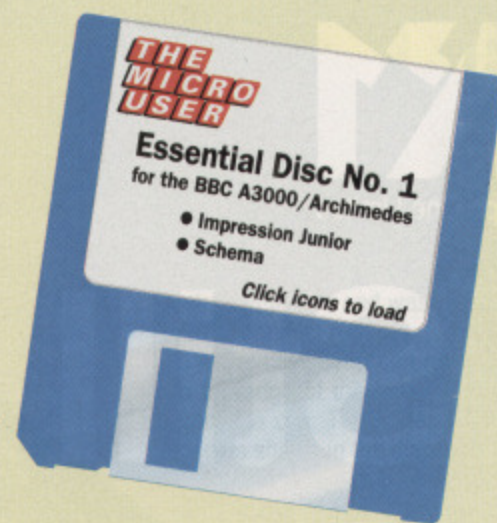
Browsing through part of the National Curriculum



Searching is straightforward



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To complement our new Essential Archimedes section (see Page 80) we are offering a free disc to the first 1,500 readers who complete and return the form at the bottom of this page.

The Essential Archimedes series will build up over the coming months into a comprehensive source of ideas and tutorials covering all aspects of the BBC A3000 and Archimedes range. The first four sections cover desktop publishing, spreadsheets, databases and graphics by object.

To help you try your hand at DTP and spreadsheets we are offering two exclusive versions of Impression Junior from Computer Concepts and Schema from Clares Micro Supplies.

An excellent introduction to the world of DTP, **Impression Junior** is the entry-level program of the Impression range.

It is simpler and less powerful than its big brother, Impression 2, but still combines all the best features of word processing and desktop publishing in one easy-to-use program. As it is frame-based you can put text and graphics anywhere you want on a page and its flexibility puts no restraints on your creativity.

Our version is identical to the program being sold for £89.95 but without the ability to save or print. Also included is the outline font manager and a special font.

**Schema** is a powerful program which incorporates all the essential spreadsheet features: Trigonometric functions, matrix operations, statistical operations and many more. It also has its own macro programming language which allows it to be expanded even further.

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Schema normally costs £135. The version on the free disc is complete in every way - apart from the Save and Print functions.

● Future subjects to be covered in *The Essential Archimedes*: Graphics by Pixel, Wordprocessing, Programming in Basic, Music and Risc OS Programming.

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**O**VER the last few months we've been looking at using our I<sup>2</sup>C interface for a number of serious data gathering applications. Well, you can't be serious all of the time so this month we will look at a very silly game. Those with Model Bs and Masters need not be left out either because you can play this through your User Port.

Being the proud father of two small children, I have found that the more gruesome a game, the better it's liked. Therefore, I present for your delectation the Computerised Brain Surgeon, a game of pure skill.

All games need a rationale so here's the scenario for this one. You are about to operate on a brain that contains seven tumours. These must be removed using a pair of tweezers.

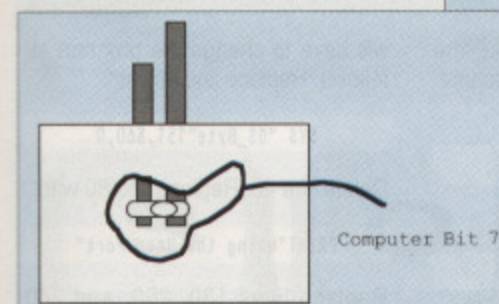
However, you must not touch the sides of the incisions otherwise you cause permanent brain damage and the patient dies. The patient is only under a local anaesthetic, so if you have an Archimedes and this month's subscription disc, some pretty strange noises will accompany the removal of each tumour.

That's the idea of the game, so how do we make it? Well, it's all done with stout cardboard and aluminium tape. You need two pieces of card separated by small spacers made from a stack of small pieces of card.

Each incision is a hole cut in the top piece. The edge of the hole is wrapped around with aluminium tape and all the holes are electrically connected. These are then connected to bit 7 of the User Port or the I<sup>2</sup>C interface. To keep things neat, these can be connected to the underside of the top board so the wiring does not show.

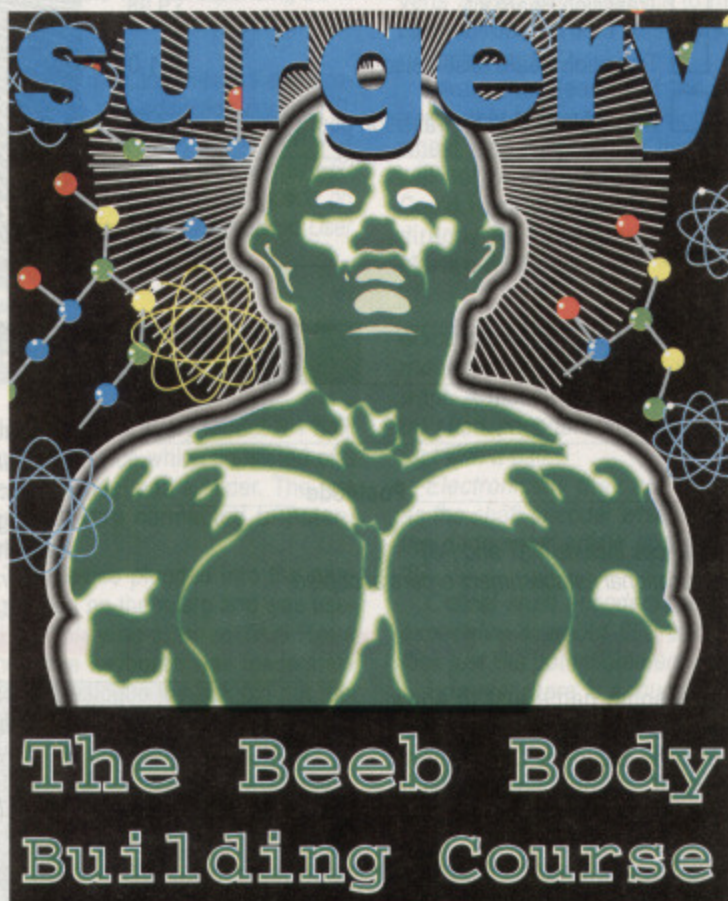
At the bottom of each hole, that is on the second card, you have two strips of aluminium tape close to each other. One side is connected to earth and the other side to a computer input.

Astride the tape sits the tumour or



Electronic surgery: incision around a tumour

# DIY brain

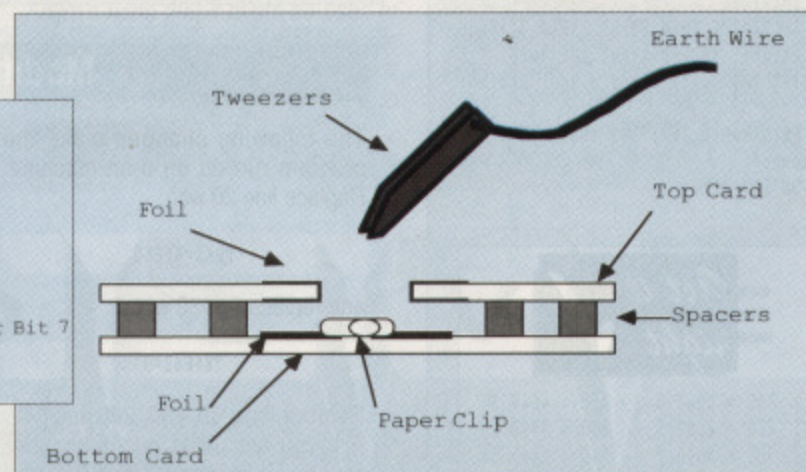


*Mike Cook introduces an amusing and educational application for the I<sup>2</sup>C bus*

paper clip which normally shorts the computer input to earth. However, when the clip is removed the computer input will assume a logic one state. You will need seven of these

sites, each connected to a different computer input bit.

Finally to remove the paper clips we need a pair of metal tweezers, with an earth wire attached. This is



Side view of part of the game

best done by drilling a small hole in the side and attaching a wire to a nut and bolt through the hole. The foil tape runs can be terminated using a nut bolt and washer to allow you to connect a wire.

Alternatively you can run the tape to the edge of the board and use a crocodile clip. The general arrangement is shown in the diagrams.

The foil tape can be made to connect if overlapped and pressed down firmly with the back of your nail. Remember that glue will act as an insulator, but I have found that there is sufficient gap to make it form a contact.

Another option is to bolt a washer over the join of two pieces. If you want two lines of tape to pass over each other without making contact, you can lay a piece of sellotape over the crossing point before you lay down the second piece.

It would be wise to test the connections with a continuity meter if you are unsure of the connections. A pack of foil tape and 20 6BA nuts, bolts and washers are available as Body Build Pack No 75.

Finally, the game needs to be connected up to the computer. This is simple if you have the I<sup>2</sup>C interface as it uses screw connectors. If you have an 8 bit machine or a conventional User Port Module then you could do with the Body Build User Port Transition board, Pack 1.

Having built up the game, and perhaps done some suitable surface drawing on the top card, you're ready for the software. A very basic game is shown in the listing, and this is suitable for a BBC A3000 or Archimedes with my I<sup>2</sup>C interface fitted. It can be modified for a Model B or Master – see the box below.

## How it works

The program first looks at the inputs until all the paper clips are in place, at which point all the inputs except bit 7 will be at zero. Bit 7 will be at a one as that is the one connected to the edge of the holes.

Then there is a delay for two seconds and they are checked again. This is because there might be a little contact bounce when you first put the clips down. This is all done in lines 100 to 210.

Next the computer's input is monitored and for each input that goes to a logic one, your score is incremented, lines 230 to 310. The variable *T%* keeps track of what pieces have been removed – this prevents





cheating by continually removing and replacing the same piece.

If you want to add a sound for each piece removed, add it to the end of line 270. This is monitored until all the pieces are removed or the side of a hole is touched.

The final state of the inputs will determine if you have been successful and the appropriate message will be displayed. Then the program loops back to the beginning and holds until all the pieces are replaced.

There is a better version on the subscription disc which has digitised sound samples that accompany the removal of each piece. Since it is a brain that you are operating on, the noises are a little whacky as random neuron circuits are fired. These include a cymbal, a duck, a gasp and a howl. The death of a patient is accompanied by a Tarzan-like yell and if you are successful you get an enthusiastic round of applause. This isn't listed because typing in digitised sounds is a little tedious to say the least.

If you want to change the sounds on the subscription disc simply copy new ones into the ISurgeon folder. Then lines 610 and 620 should be changed to reflect the name of the new sound file. Note that the number after the sound name is the speed at which the sound should be played. And there you have it. A

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☐ Transition Board kit £9.98

☐ Transition Board assembled £11.00

☐ Assembled cable for transition board £7.50

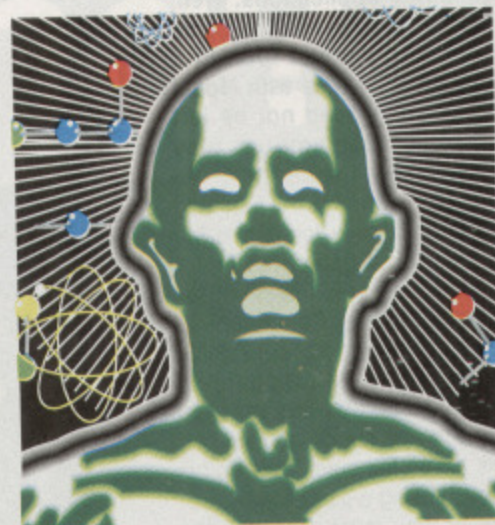
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Address \_\_\_\_\_

Postcode \_\_\_\_\_

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## BEEB BODY BUILDING PACK ORDER FORM



Make cheques payable to Musbury Consultants and send to:

8 Fairhill, Helmshore, Rossendale,  
Lancs. BB4 4JX.

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Eurocheque  
(for bank clearing charges).

very gruesome game just to show that we are not always serious here in the Body Building Department. Next month, something completely different.

```
10 REM >IIC.BRAIN
20 DIM PBKX 3
30 ?PBKX=&FF
40 SYS "IIC_Control",&70,PBKX,1
50 MODE 1
60 PRINT"BRAIN SURGEON"
70 PRINT" By Mike Cook"
80 PRINT"Using the IIC interface card"
```

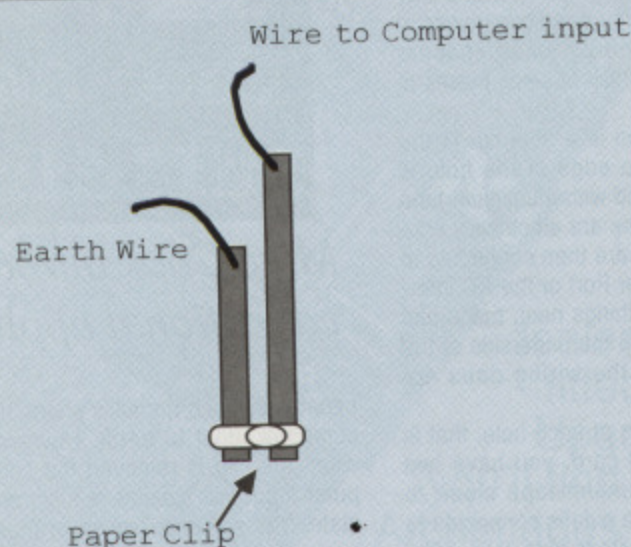
```
90 PRINT TAB(0,14)"Score"
100 REPEAT:REPEAT
110 PRINT TAB(0,23)"Put in place all the pieces of Brain"
120 REPEAT
130 SYS "IIC_Control",&71,PBKX,1
140 UNTIL ?PBKX=&80
150 PRINT TAB(0,23)"Now begin to remove the Brain Tumours"
160 PRINTTAB(0,17);SPC(39)
170 PRINTTAB(0,19);SPC(39)
180 TIME=0
190 REPEAT UNTIL TIME > 200
```

```
200 SYS "IIC_Control",&71,PBKX,1
210 UNTIL ?PBKX=&80
220 SCORE=0:TX=0
230 REPEAT
240 SYS "IIC_Control",&71,PBKX,1
250 AX=?PBKX:VX=1
260 FOR BX=0 TO 6
270 IF (AX AND VX)<>0 AND (TX AND VX)=0 THEN TX=TX OR VX:SCORE+=1
280 VX=VX*2
290 NEXT
300 PRINT TAB(0,14);"Score ",SCORE
310 UNTIL (AX AND &80)=0 OR (TX=&7F)
320 TMX=TIME
330 IF TX=&7F THEN PRINT TAB(0,17)"Congratulations! Your patient survived." ELSE:PRINT TAB(0,17)"Sorry - your patient died"
340 PRINTTAB(0,19);"You took ";TMX/100;" Seconds"
350 UNTIL FALSE
```

10 = 00	100 = 5D46 F	190 = CEE9 E
20 = FE1E E	110 = 562F 5	200 = 9D27 E
30 = 360D 6	120 = BFBA A	210 = 23BF A
40 = DAF4 C	130 = 9D27 E	220 = C208 1
50 = 7054 4	140 = 23BF C	230 = BFBA 3
60 = 5AAB C	150 = 9301 6	240 = 9D27 1
70 = 9036 5	160 = 9E7B 7	250 = E5AB 3
80 = 1CB 4	170 = 6A D	260 = 8A75 0
90 = AE5F 4	180 = 173E B	270 = D81E 2

Get it  
right ✓

280 = D087 B	320 = 4649 F
290 = 2C83 3	330 = 394B E
300 = 8546 7	340 = E455 6
310 = 5362 3	350 = 226C C



One of the  
tumour sites

### Modifications

The following changes make the program run on an 8-bit machine. Replace line 20 with:

PBKX=&FE60

and replace line 30 with:

?&FE62=0

Remove lines 40, 130, 200 and 240. If you are using an Archimedes with a conventional User Port you

will have to change the program as follows. Replace line 30 with:

SYS "OS\_Byte"151,&60,0

Delete line 40. Replace line 80 with:

PRINT"Using the User Port"

Replace lines 130, 200, and 240 with:

SYS "OS\_Byte"150,&60 TO ,,?PBKX



# P R O B L E M

## Pass the port...

I HAVE recently sold my old Master Compact and obtained a new Master 128. My Morley Teletext adapter plugged into the joystick port on the Master Compact. I want to rewire this to plug into the user port on my Master 128. — **Andrew Brigg, West Yorks.**

● The Compact, unlike the BBC B and Master, does not have an analogue input, so the joystick port is in fact the user port. Therefore you cannot connect the unit up to the Master's joystick port which is an analogue input.

You will need to connect the teletext adaptor to the user port. I spoke to Morley Electronics who said they would be happy to do this for you if you send your unit back.

## ...any port

I HAVE a BBC B for and I am building a speech synthesiser which is to connect to the user port on my micro.

Unfortunately I do not know the user port's address. I have looked through the User and Advanced User guides but have not been able to find the information I need. Can you help me? — **Jonathan Whale, Cambridge.**

● The address of the user port is

&FE60. This is, in fact, given on page 437 of the User Guide, but in a somewhat cryptic form. Before you can use it you must tell it which pins are to be used as inputs and which as outputs.

You do this by writing to the Data Direction register at address &FE62. Each bit containing a one in this location will make the corresponding bit in the user port an output. A zero bit will make it an input.

You can read and write to these locations using the indirection operator ?. The user port is really the B side of a VIA that is addressed between &FE60 and &FE6F. For further information on what it contains see the Advanced User Guide.

## Steering the Arc

WHEN I had a trusty Model B I built a control device which consisted of a steering wheel and a slider. The two controls were connected to potentiometers.

This device plugged into the analogue port on the micro and was useful for playing games like Revs where the keyboard was inadequate and an analogue joystick did not feel right. It worked well and increased my lap time on Revs considerably.

I have now bought an Archimedes and would like to use a similar

device. This time it will have to plug into the mouse port. I have seen your body building pack which converts a BBC Micro joystick to mouse connections. Would this work in a realistic manner?

I want the steering of the car to accurately follow the position of the wheel, and suspect that this method will not provide adequate control. Could I use the innards of a mouse directly as input devices? — **Tim Morley, Bolton.**

● You are quite right. The joystick-to-mouse converter is not what you want. A mouse is basically two digital shaft encoders mounted in contact with a ball.

Electronically they are the same as the shaft encoder which I used in the pedometer article in September '87.

Optical shaft encoders tend to be expensive at about £50 each, and look just like potentiometers.

However there is a much cheaper contact type available at about £7.00 from Maplins. Being a contact type, it will require some de-bounce circuitry of the type shown in my article.

## Rom filing system confusion

I HAVE an Issue 7 machine which I particularly need to use with the RFS. ICs 98 and 99 are already installed but there is no holder for the rom cartridge.

Nor can I find any information as to the type of holder required or the way in which it is connected. It would appear from inspection of the circuit diagram that only 10 connections are available for a 28 pin rom.

Can you give any information please? — **L. G. Barlow, West Midlands.**

● I think you are confusing two

things here. The speech synthesiser chips IC98 and 99 do incorporate a sort of Rom Filing System (RFS), but this is a serial system designed to add extension vocabulary chips to the system, as I showed in the March '85 edition of The Micro User. Only a few of the lines in the chip are used, hence the small connector.

When it was produced it was Acorn's hope that it might be used to transfer programs as well. However, this needed a custom chip and it proved too expensive for anyone to bother with.

However the real RFS uses the

normal sideways rom chips. With this you blow files into an eprom and access them like a small slow disc drive. The files need a bit of header code and this is described in the Advanced User Guide, in fact the format is very like the Cassette Filing System.

The Watford Eprom programmer software has a utility to assemble several files into an Eprom automatically. To access them you need to type in \*ROM then you can catalogue and load in the files in the normal way. You cannot, of course, save them.

## Your technical questions answered by MIKE COOK

### Living in a box

I WAS interested in the question about RF interference in a recent Problem Solved. I have encountered this problem when using the BBC Micro in conjunction with my amateur radio activities.

I was surprised that it should occur with broadcast reception where the "wanted" signals are at a much higher level. Perhaps the first step should be to check that there is not a major fault in the receiver.

Most of the interference usually comes, not from the computer itself, but from the monitor and its connecting lead. It is often particularly marked if a colour monitor is used. The most effective step in curing this problem is to put everything inside a metal box, but this need not render the keyboard unusable.

The answer, which I have found completely effective, is to coat the inside of the case with a nickel-based screening aerosol which should be available from any good supplier of electronic components.

In my case spraying the inside of the monitor case was sufficient, but having bought the aerosol you might as well spray the inside of the computer at the same time.

ALL the works MUST be removed before spraying! Also it is essential that the coating itself is then earthed between the computer, the monitor and if possible the receiver. — **L.G. Barlow, West Midlands.**

● Thank you for the information. I knew about the screening aerosol, but have never had good reports of it before. As it is so expensive I was loath to recommend it. However, it seems to have served you well.

# S O L V E D HELP



# DON'T DECIDE ON A NEW HARD DISC UNTIL YOU HAVE READ

**"HOW TO CHOOSE A HARD DISC FOR YOUR ARCHIMEDES WITHOUT  
MAKING ANY SERIOUS ERRORS OF JUDGEMENT AND ENSURING  
OPTIMUM VALUE FOR MONEY"**

If such a document existed life would be easier, but, as we haven't written it yet, we suggest that you read the following *IMPORTANT* information.

## THINK ABOUT THE FUTURE

The average Archimedes user can probably make do with about 45Mb of hard disc storage. CD ROM hasn't really taken off yet on the Archimedes, and read/write optical storage is still far too expensive for everyday use. Tape backup systems, while useful, are considered a bit of a luxury when you can back up to a pile of floppy discs.



*The right tool for the job*

When the Model B came onto the scene people were making the same kind of decisions about cassette decks. How things change! However, there is one big difference between then and now. Now, it doesn't cost a fortune to 'future-proof' your expansion options.



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## WHY GO FOR A SLOW SYSTEM WHEN YOU DON'T HAVE TO?

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**R**EVISION seems to be the name of the game this month, what with new versions popping up all over the place. Not to mention the examination revision quiz-type questions from the Welsh Boys.

Just in time for mock exams you can test yourself on Atomic Theory, Electronic Arrangement or Atomic Numbers using your Beeb - I was quite pleased with just how much I remembered from my O levels.

If trigonometry or equilateral triangles are more of a bugbear than they can help, too. However, if you are more confident they have just the thing - a CV compiler.

Moving on and up is James Coates who runs Procrastinet PD and The PD Magazine. He's now left Ludlow College and changed the name to Different Ideas. At the same time he's also acting as caretaker for John Harston's library, JGHPD. If you feel that your order has been ignored it is possible that it has gone astray so do contact them at their new address at the end of the column.

Version 4 of Sound Tracker landed

on my desk recently plus some nice utilities for the more music conscious out there.

You'll have probably seen VU bars before, but how about a spectroscope and an echo? Echo II is a digital delay line which operates in four-voice mode and controls voices 5 to 8 of any SoundTrack you want. The sliding controls allow you to alter the delay time, feedback, volume and modulation speed.

Spectre + is another Warner Hepping production. It gives a spectrum estimation in a window while a tune is playing. From left to right you can see the amplitude of 64 frequency bands with the frequency of each band increasing linearly.

The latest version I've seen in 1.06 which goes some way to stopping the leaking between amplitude values - not surprising considering the size of the analysis.

Cotswold PD have a good selection of BBC tunes too, while Cream PD have

a useful service where you select which tune/track you want rather than having to take pot luck with a sounds disc - nice idea.

A later version of Translator 6.44, plus a little utility called Modes, turned up recently but I believe version 6.4 is now shareware while a later version 6.6 includes windows created with Interface. Watch this space for further details.

I've heard from a couple of you who have been having problems with Oak SCSI drives and ArcFS. Not to worry I've been assured that this will be all sorted out and a new version of ArcFS will be on the November subscription disc.

One of the most common programs I come across in the PD world must be adventures. Usually written using Quill or ALPS, they are generally worth a hour or so's play at the very least. Therefore, it was with some interest that I booted up the Adventure Generator.

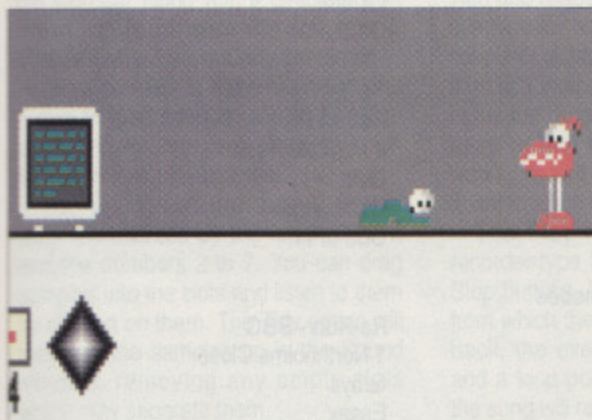
Unique, as it works on both the

BBC and Archimedes it comes with a sample called the Talisman of Ryke. Perhaps not the best adventure in the world, but as an example of what you can do with a little imagination it is excellent.

There is only one problem - it's shareware and not PD. But never fear, you can get the software, manual and demo game as well as program notes for £5 or just the software for £1 on Archimedes disc, 75p on BBC B disc, from: T Blunt, Inglenook, Kiln Lane, Binfield, Henley, Oxon RG9 4EH. Don't forget to say which version you need.

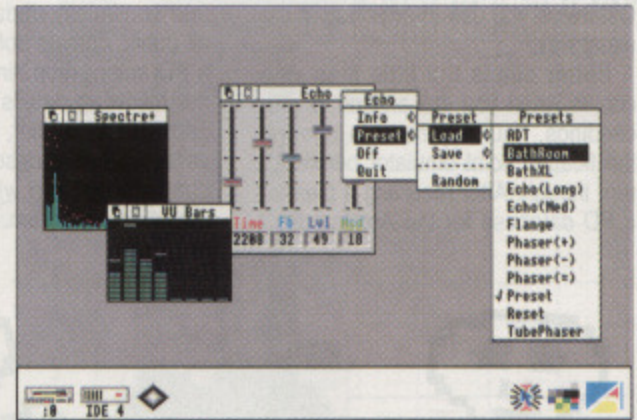
## Game for a laugh

It was nice to see Soft Rock Software releasing cut-down versions of Escape from Exeria and Guardians of the Labyrinth in to the public domain. The former is a Hac Manesque Archimedes offering and although the first screen is impossible you can jump to the other nine levels at will. If you are hooked you can buy the full version from Soft Rock. Guardians is



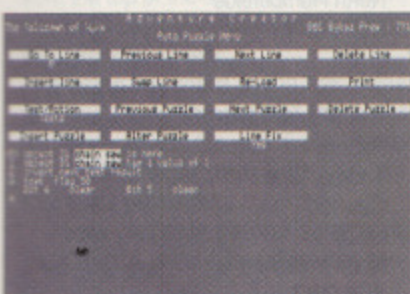
Bugs have never been such fun

# PUBLIC PD DOMAIN



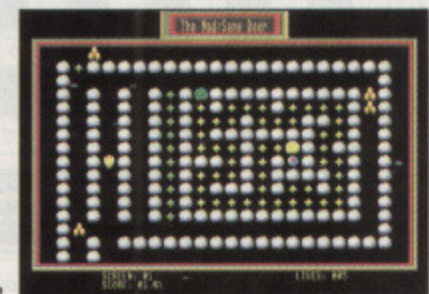
You can say that again

# Of music, bugs and adventures...



Create your own adventures

*Taking the bull  
by the horns,  
Teri Paul enters  
the PD arena  
anew*



Escape if you can





FEATURE

# DON'T DECIDE ON A UNTIL YOU

not so potentially gripping and the graphics are not tip top, but if you have been pining away for a superior-style arcade adventure this could go some way to easing the loss.

Still on the game front, a couple of unusual offerings arrived courtesy of JD Public Domain in Holland. Both are for the BBC. Exiz is basically space invaders but with nice looking graphics and jingles to raise it above the norm. Kitchen, by Kai Sui Ng, is not nearly as pretty but is unusual.

Your food has all migrated to the kitchen ceiling – no, I don't think that it is a strange Dutch custom – and you have to catch the eggs, sausages and chips with a frying pan and toss them on to the cooker. Easy enough until more than one item of food decides to fall...

While on the subject of ceilings and games, a new desktop silly bumped into my icon bar during the month. Introducing himself as DeskBug, he shares an uncanny resemblance to BugHunter from Minerva.

He trots around your screen while a random bug appears quite unconcerned when you click the mouse. Otherwise you use the desktop in the usual way.

Better still is the little man who comes when you call an end to proceedings. You may need to boot up the floating point emulator before it'll run, though. After receiving a plea for a PD database for the Archimedes I

## The monthly disc

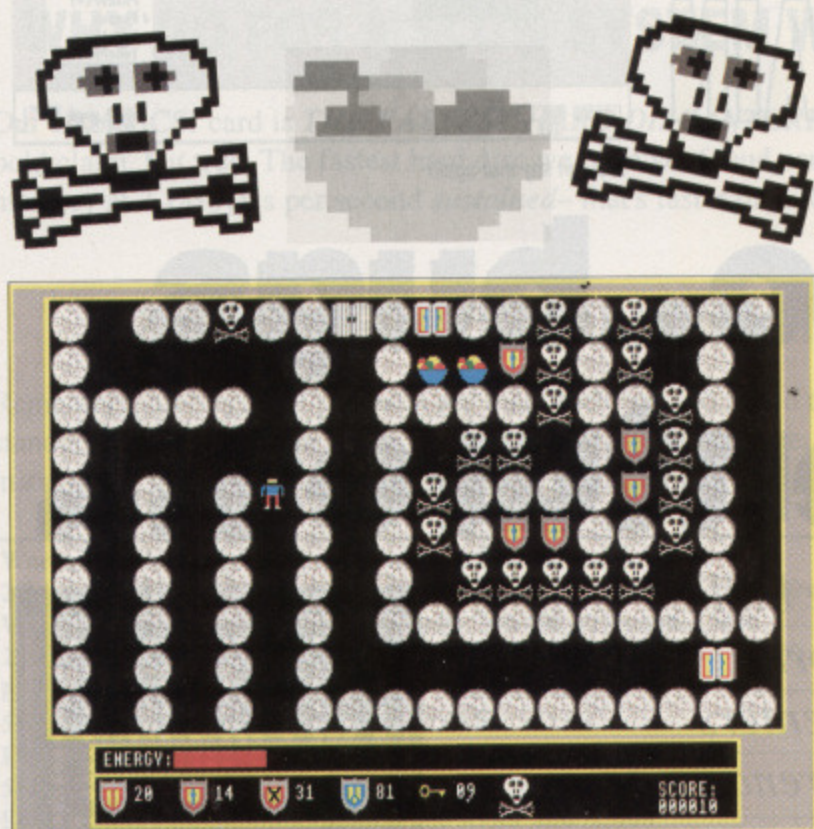
You'll find most of the Archimedes programs mentioned here on the subscription disc. All have been virus checked. To squeeze on as much as possible we have archived the programs.

If you are unsure how to create a ram disc and unarchive the files, open the IReadMe file on the disc and follow the step-by-step instructions.

found in my post two such programs for the BBC.

Welsh Boys PD have a simple address program which is useful for simple contact files, whereas Chris Pinnock's Einstein 1.2 has rather more to offer. More complex, it uses virtual memory, so you are able to store more away by just using a floppy disc.

Matthew White has set himself the mammoth task of creating a complete and continually updated database of all public domain software. If you are a PD author drop him a line including the following details about your programs: title, author, computer, latest version number, description – max 30 characters – and where people can obtain your program.



Find your way through the labyrinth to fame and fortune

# PD Libraries

Do remember always to send an SAE when you write to any of the PD libraries – they can keep their costs down only if you help, too.

### Abyss Software - Archimedes

35 Grantley Crescent  
Kingswinford  
Valley Fields  
West Midlands  
DY6 9EH

### JD Public Domain - BBC

7 Klembergerweg  
7214 BK Epse  
Holland

### Arch PD - Archimedes

109 Ferry Road  
Hullbridge  
Hockley  
Essex  
SS5 6EL

### Mad Rabbit PD - BBC

22 Oakwood Grove  
Horbury  
Near Wakefield  
West Yorkshire  
WF4 5JE

### BBC PD - BBC

18 Carlton Close  
Blackrod  
Bolton  
BL6 5DL

### MHPD - Archimedes

3 Rodmell Close  
Bromley  
Cross  
Bolton  
BL7 9DT

### RE Clark PD Library - Archimedes

Westbourne House  
34 Bradley Street  
Wooton-under-Edge  
GL12 7AR

### Ozone Friendly - Archimedes

180 Cumnor Hill  
Oxford  
OX2 9PJ

### Cotswold PD - BBC

Maycombe  
Field Road  
Whiteshill  
Stroud  
Gloucestershire  
GL6 6AG

### Robert Pike

4 Mayfield Road  
Girton  
Cambridge  
CB3 0PH

### Cream PD - Archimedes

38 Baunton  
Cirencester  
Gloscester  
GL7 7BB

### Re-Run - BBC

1 Northholme Close  
Grays  
Essex  
RM16 2NX

### Different Ideas PD - BBC

Eyton House  
Eyton  
Leominster  
Herts  
HR6 0AG

### Soft Rock Software - Archimedes

124 Marissal Road  
Henbury  
Bristol  
BS10 7NP

### Digital Illusions - Archimedes

20 College Road  
Wembley  
Middlesex  
HA9 8RL

### Matthew White - PD Database

The Pines  
7 Peasehome  
Hessle  
North Humberside  
HU13 0HY

### Digital Phenomena - Archimedes

104 Manners Road  
Southsea  
Hants  
PO4 0BG

### The Wizard - BBC

Ryburn  
Thorpe Lane  
Cawood  
Selby  
North Yorkshire  
YO8 0SQ

### Equinox PD - Archimedes

27 Station Road  
Earls Barton  
Northampton  
NN6 0NT



**T**HE Archimedes has, of late, become abundantly blessed with sample-related products and UltraSonic (review version 1.0) is a sample playback program designed to produce music for games and demos.

The music files it produces are compatible with the Creator Arcade Games Designer reviewed in the July issue.

The package contains two discs. One holds the editor and sample handling programs, the other contains 150 samples grouped into five directories – Bases, Instrument, Looped, Percussive and Strange. The discs aren't copy-protected – 10 out of 10 here – and the manual suggests you make a backup or copy them to your hard disc.

To play a piece of music you double-click on the !SoundExt icon to load the play module. You can then load and play a piece of UltraSonic music by double clicking on it.

The play module doesn't appear on the icon bar and there is no easy way of stopping the music. There are seven demo pieces including Axel-F and the Theme from Alf.

The music editor, !Ultra, appears on the icon bar along with a directory icon which lets you access the Sounds\$Dir directory where the sounds are stored.

!Ultra consists of three main sections – one to load sounds, one to edit patterns and another to arrange the patterns into their playing order.

The Sounds window has 32 sound slots represented by the letters A to Z and the numbers 2 to 7. You can drag samples into the slots and listen to them by clicking on them. The Tidy option will move all the samples up in the Sound window, removing any empty slots which may separate them.

You can set the path of each sound to Sound\$Dir which lets you copy all the sounds used into one directory and access it through the Sound\$Dir variable.

Strip Path strips the filepath completely, making the editor search for sounds in the directory the music was loaded from, allowing you to group sounds with the music which uses them.

The Pattern Editor is a variation of the popular grid editor found in many music programs as an alternative to music notation. However, the time scale runs from the top of the screen to the bottom, which will seem strange if you're used to the horizontal variety.

A piano keyboard at the top of the window shows the pitch of the notes and beneath it is the grid. Each beat is divided into eight steps and there are four beats per pattern.

There can only be one sample on each step. A pattern, therefore, can consist

of up to a maximum of 32 steps although the length of each sample can be individually set. You can create up to 256 patterns and copy one pattern to another.

You insert a note by clicking on the grid with the Select button and insert a rest or remove a note with the Adjust button. Unfortunately, you don't hear the sample as it is clicked into place, although you can hear the whole of the pattern you're working on by right-clicking on the Play button in the Play window.

Each note has several attributes which can be individually adjusted – Pitch, Amplitude, Stereo position, Smooth and Length. These are shown in a separate window and also in condensed form in the Pattern Editor next to each step. You can alter the settings on any step using the abbreviated display.

Notes can be entered from a Midi keyboard and from the computer's keyboard, although these must be used in real-time while other tracks are playing. The computer keyboard can only play across one octave, but you can change the octave with a select button.

Using a grid to display notes is a tried and tested idea, but the grid is too fine for easy note placement. It's only a couple of pixels between notes, and as the pitch indicator – the keyboard – is at the top of the screen, it's not always easy to find the pitch you want. It works, it's just a little fiddly, that's all. A zoom function might help.


The Play window contains tape recorder-type Play, Fast Forward and Stop buttons. You can set the position from which the song will begin to playback, the overall length of the song and a loop point – the place to which the song will return if it is set to loop.

There is also an Autofade option which causes the last three to six patterns – depending on their length – to fade out – a nice touch, especially for music to be used in games.

Patterns are linked in the Step Editor window. UltraSonic can handle up to four parts which the Step Editor calls Tracks. It can handle up to 256 steps and on each step you can specify a different pattern for each of the four Tracks, a Tempo setting and a Length. There are insert, delete and copy functions here, too.

The length of the song is shown in the Step Editor in black, although the length is actually adjusted from the Play window which, in turn, is called from the Pattern Editor.

UltraSonic has its own file format, so you can't load sounds from other sources although the discs contains a converter program which lets you

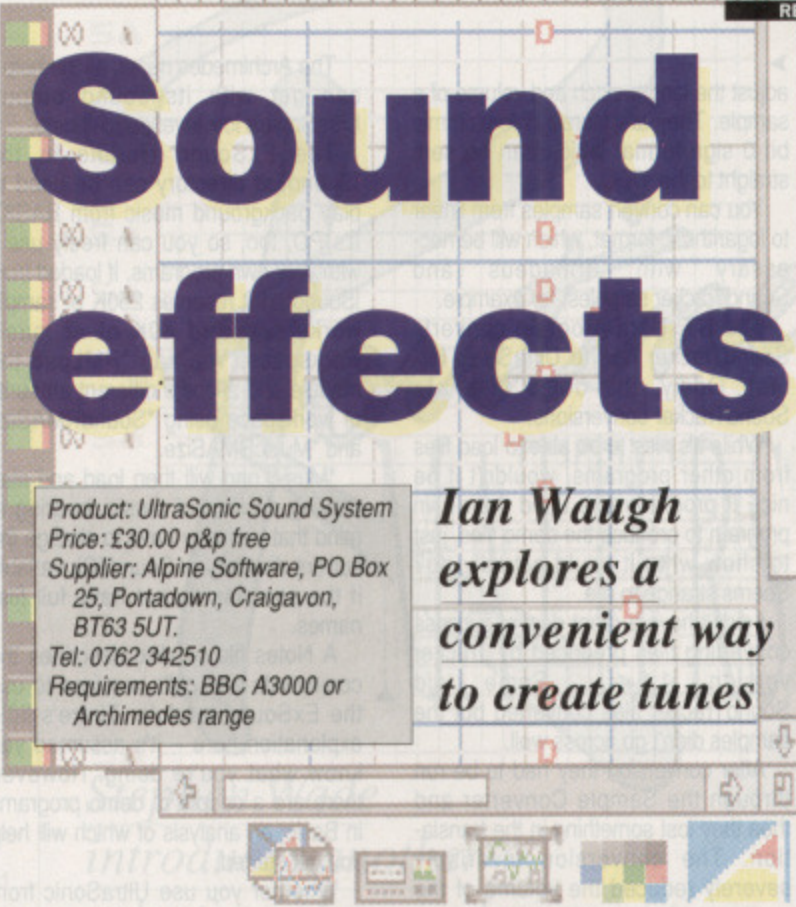
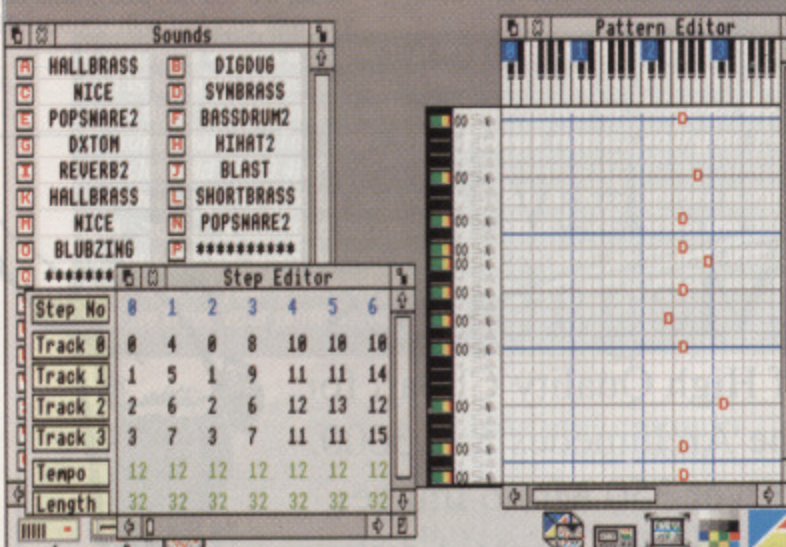


REVIEW

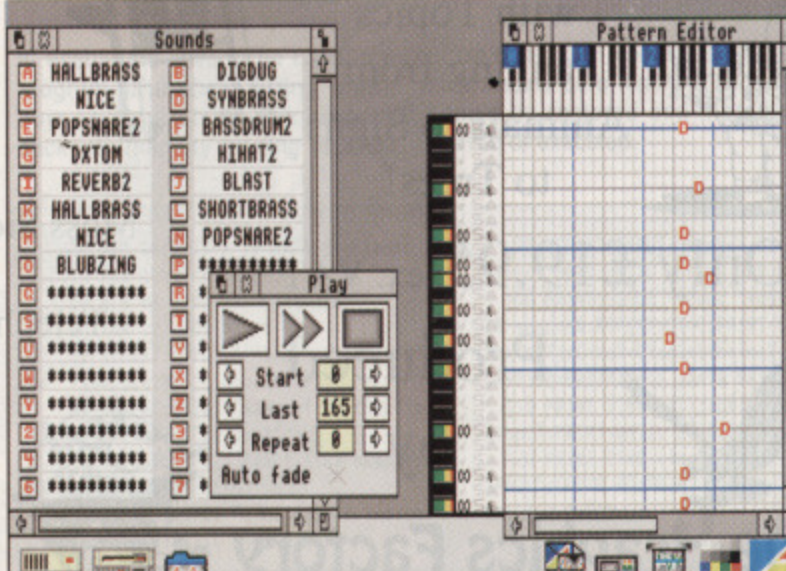
# Sound effects

**Product:** UltraSonic Sound System  
**Price:** £30.00 p&p free  
**Supplier:** Alpine Software, PO Box 25, Portadown, Craigavon, BT63 5UT.  
**Tel:** 0762 342510  
**Requirements:** BBC A3000 or Archimedes range

**Ian Waugh**  
*explores a convenient way to create tunes*

Step No	0	1	2	3	4	5	6
Track 0	0	4	0	8	10	10	10
Track 1	1	5	1	9	11	11	14
Track 2	2	6	2	6	12	13	12
Track 3	3	7	3	7	11	11	15
Tempo	12	12	12	12	12	12	12
Length	32	32	32	32	32	32	32



**Play**

Start: 0

Last: 165

Repeat: 8

Auto fade: [X]





REVIEW

adjust the length, pitch and volume of a sample. They are stored in logarithmic bit 0 sign format which can be sent straight to the VIDC.

You can convert samples from linear to logarithmic format, which will be necessary with Armadeus and SoundTracker samples, for example.

The ST>Ultra program converts SoundTracker files to UltraSonic format. Oddly, the demo files are SoundTracker conversions.

While it's nice to be able to load files from other programs, wouldn't it be nice if programmers used their own program to produce the demo files, just to show what it could actually do? Seems strange to me.

I didn't have a great deal of success converting files produced by Tracker version 1.0+... Some old SoundTracker files converted but the samples didn't go across well.

After conversion they had to be run through the Sample Converter and then they lost something in the translation. The conversion invariably severely reduced the volume of the music, too, and even the demo files are almost half the volume of Tracker music.

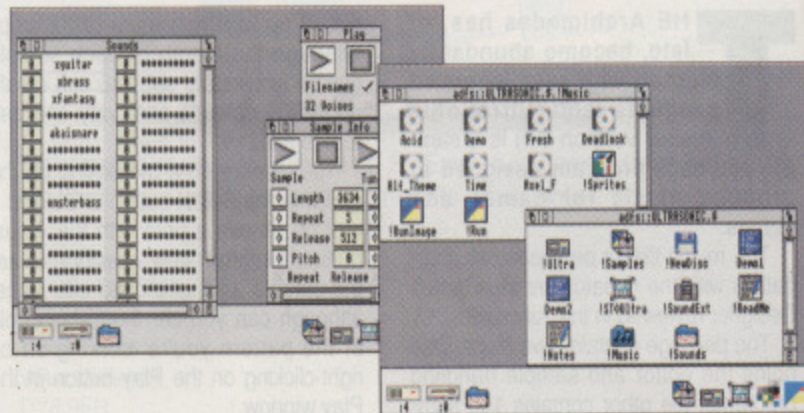
The Archimedes needs all the help it can get with its sound output. UltraSonic's low level doesn't help.

The ExSound module in the !SoundExt directory can be used to play background music from BASIC. It's PD, too, so you can freely use it with your own programs. If loaded from !SoundExt it reserves 250K of sample workspace and 40K of of music workspace. You can \*RMLoad the module and allocate different amounts of workspace using \*SoundRMASize and \*MusicRMASize.

\*MusicLoad will then load and start playing a piece of music, bearing in mind that you may have to change the current directory or Sound\$Dir variable if the samples do not have full file-names.

A Notes file on disc describes the commands and calls required to use the ExSound module. There's little explanation here - it's assumed you know what you're doing. However, there are a couple of demo programs in Basic, an analysis of which will help you get started.

Whether you use UltraSonic from Basic or just use the Editors to create music, the 150 samples should keep you well supplied with sounds. The



manual is a mere six pages in length and while it explains the basic functions of the program, it is woefully inadequate. You will be able to fuddle your way through - but why should you?

A short tutorial would be quite easy to write and the program really needs a few simple hands-on examples.

UltraSonic is not difficult to use, but it could have been made much easier. However, it is fully Risc OS compatible which is a first for this class of program - which doesn't include Maestro and Rhapsody. The Archimedes has a superb user-interface and it's annoying to see programs which don't use it so well done for that. If you don't already

have Alpine's Creator, you can buy both UltraSonic and Creator for £62.95, a saving of £6.

### Summing up

Sample player programs tend to have been written by hackers for hackers. UltraSonic tries to be more accessible, but the manual and certain areas of implementation let it down a little.

If you balk at Tracker's numeric approach you may well prefer UltraSonic's grid and Risc OS approach. It's cheaper, too.

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## Smarten up your displays

Author: Pete Goodliffe  
Language: Basic  
Filename: SmrtTxt

SMART text is essentially a complex – yet short – program which prints enlarged text on the screen by reading individual character definitions with *Oswald 10*. It does this in order to draw a scaled version of each character using various graphics commands in conjunction with a complex formula.

Exactly how it works would take a while and a great deal of space to explain fully, but experienced programmers should be able to follow the logic in the program and determine exactly what happens and how it is done.

All you need to know in order to use the program is the parameters which the procedure *xtxt* requires to produce the effect. They are:

The string of text to be printed  
Bottom left X co-ordinate  
Bottom left Y co-ordinate  
Top right X co-ordinate  
Top right Y co-ordinate

The co-ordinates relate to the position of the whole enlarged string on the screen and thus the total area to be covered by it.

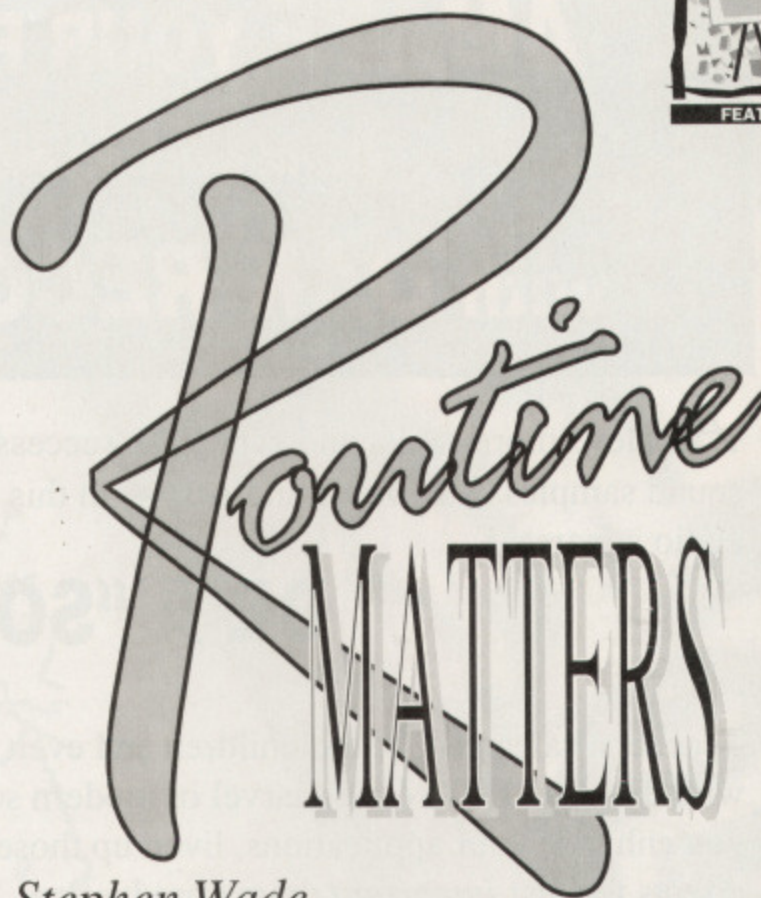
Interesting effects can be obtained using distorted text in the background,

or by passing the co-ordinates to the procedure in a different order. For example, passing the top right co-ordinate followed by the one for bottom left will print the text upside down.

This opens up many possibilities, such as adding a shadow to displays and many other similar effects.

As yet, the program cannot handle vertical or diagonal text printing – although it must surely be possible. Can anyone produce a routine of reasonable speed which will do this?

```
10 REM Smart Text
20 REM by Pete Goodliffe
30 REM (c) The Micro User
40 MODE 2:VDU 23,1,0;0;0;0;
50 DIM G%(7):AX=&A:X%=&80:Y%=&0
60 FOR M=1 TO 8:READ col,AS,X1,Y1,X2,
Y2:GCOL 0,col:PROCxtxt(AS,X1,Y1,X2,Y2):
NEXT:GCOL 0,2:MOVE 50,850:DRAW 1230,850
70 VDU 31,0,20:END
80 DEF PROCxtxt(AS,X,Y,L,H)
90 L=(L-X)/LEN(AS)/8:H=(Y-H)/8
100 FOR N=1 TO LEN(AS)
110 ?&80=ASC(MID$(AS,N,1)):CALL &FFF1
120 FOR A=0 TO 7:FOR B=8 TO 1 STEP-1
130 IF(?&81+A)AND 2*(B-1)<0 MOVE X+
(N-1)*L*8+(8-B)*L,Y-A*H:PLOT 0,L,0:PLOT
81,-L,-H:PLOT 81,L,0
140 NEXT:NEXT:ENDPROC
150 DATA 6,SMART-TEXT,50,1015,1230,850
160 DATA 1,By Pete Goodliffe,50,840,12
30,810
170 DATA 4,ROUTINE,0,800,1250,550
180 DATA 5,MATTERS,30,550,1220,450
190 DATA 3,1,1210,800,1280,735
200 DATA 3,9,1210,735,1280,670
210 DATA 3,9,1210,670,1280,605
220 DATA 3,1,1210,605,1280,540
```



Stephen Wade  
introduces another  
selection of your clever routines

If you have written a routine that may be of interest to other readers and is suitable for publication in this column, do not hesitate to send it on disc or tape along with documentation to: **Stephen Wade, Routine Matters, The Micro User, Europa House, Adlington Park, Macclesfield SK10 4NP**

Don't forget to give us your name, address and telephone number, and enclose a stamped addressed envelope to guarantee the return of your media. Also provide us with a declaration stating that the routine is all your own work, has not been submitted elsewhere, and that we have your permission to use it.

## READ all about the DATA

Author: Jonathan Markland  
Language: Basic  
Filenames: DataCnv and ReadDta

WITH assembled machine code programs or Ascii data files it is often difficult to pass on the stored information to fellow users by way of paper.

The same is true about trying to append predefined data to a program in a format which can be easily understood and converted back.

One simple solution is to translate the data file into the form of DATA statements. The resulting lines can be output to a new file, and subsequently either printed out or attached to a program by way of the *\*EXEC* command.

This is the principle behind the program below. It converts an Ascii

data file into a set of DATA statements in a separate file, requiring several pieces of information to be input in order to go about its task.

These are:

Name of the source data file  
Name of destination file for DATA statements to be output to  
Line number to commence with  
Increment between subsequent line numbers  
Number of bytes to be output to each line (between 1 and 120)

The program is compatible with the whole range of 8-bit Acorn micros containing Basic II or later and connected to a disc system or network. Owners of Basic I machines will need to substitute the *OSCLI* command for a *PROCS* type routine.

Reading the data back into a useable format is quite straightforward: Simply *\*EXEC*ute the file created by the program while in Basic

```
10 addr=&900:RESTORE
20 REPEAT:READ AS
30 IF AS<>"--" PROCdata
40 UNTIL AS="--"
50 PRINT &900:END
60 DEF PROCdata:FOR J=1 TO
LEN(AS)-1 STEP 2:$addr=CHR$(EVAL("&"+MID$(AS,J,2))):addr=addr+1:NEXT:E
NDPROC
70 DATA 2A477565737320776861743F
80 DATA 20497420776F726873212A0D
90 DATA --
```

to enable the lines to be used in a program. The above listing shows how an Ascii string can be read back into memory starting at &900

from coded DATA lines. Using a similar routine pure machine code data could be restored and then either saved or executed.

```
10 REM Data file to DATA statement
20 REM conversion program
30 REM by Jonathan Markland
40 REM (c) The Micro User
50 REPEAT:INPUT "Name of source file: "source$:UNTIL source$<>"
60 REPEAT:INPUT "Name of destination file: "dest$:UNTIL dest$<>"
70 REPEAT:INPUT "Start line number: "line$:UNTIL line%>0
80 REPEAT:INPUT "Line number increment: "lineinc$:UNTIL lineinc%>0
90 REPEAT:INPUT "Number of bytes per line: "bpl$:UNTIL bpl%>0 AND bpl%<121
100 PRINT:OSCLI "SPOOL "+dest$:XX=OPEN IN source$:REPEAT:C%>0:PRINT STR$(line%)"DATA ";:line%=line%+lineinc%:REPEAT:C%>0:J%>0:IF J%<16 PRINT "0";
110 PRINT STR$(J%);:UNTIL EOF#XX OR C%>0:PRINT:UNTIL EOF#XX
120 PRINT STR$(line%)"DATA --":OSCLI "SPOOL":CLOSE #0:PRINT "File "+dest$+" complete.":END
```



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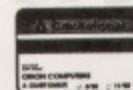


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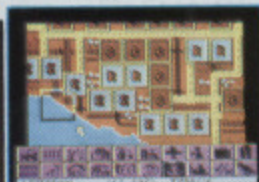
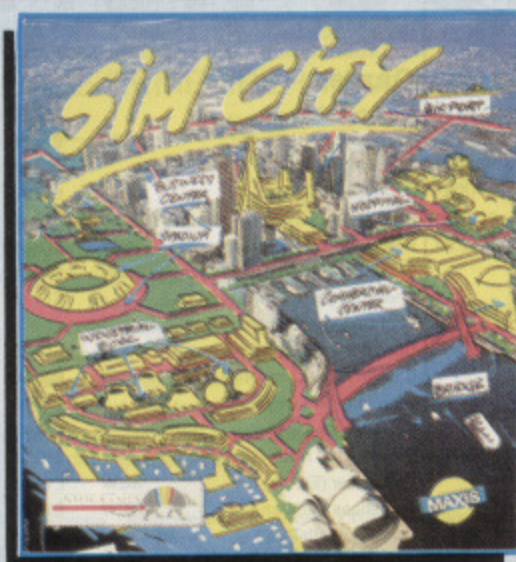
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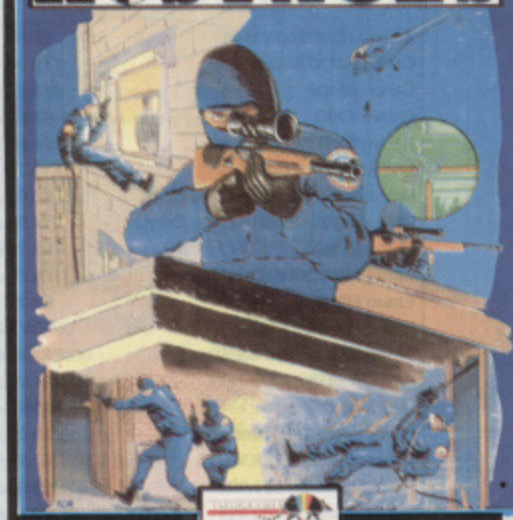


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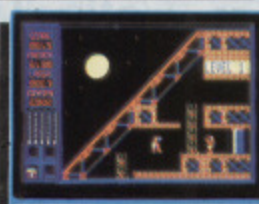
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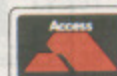
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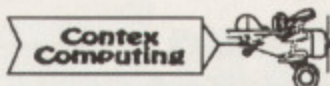
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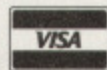
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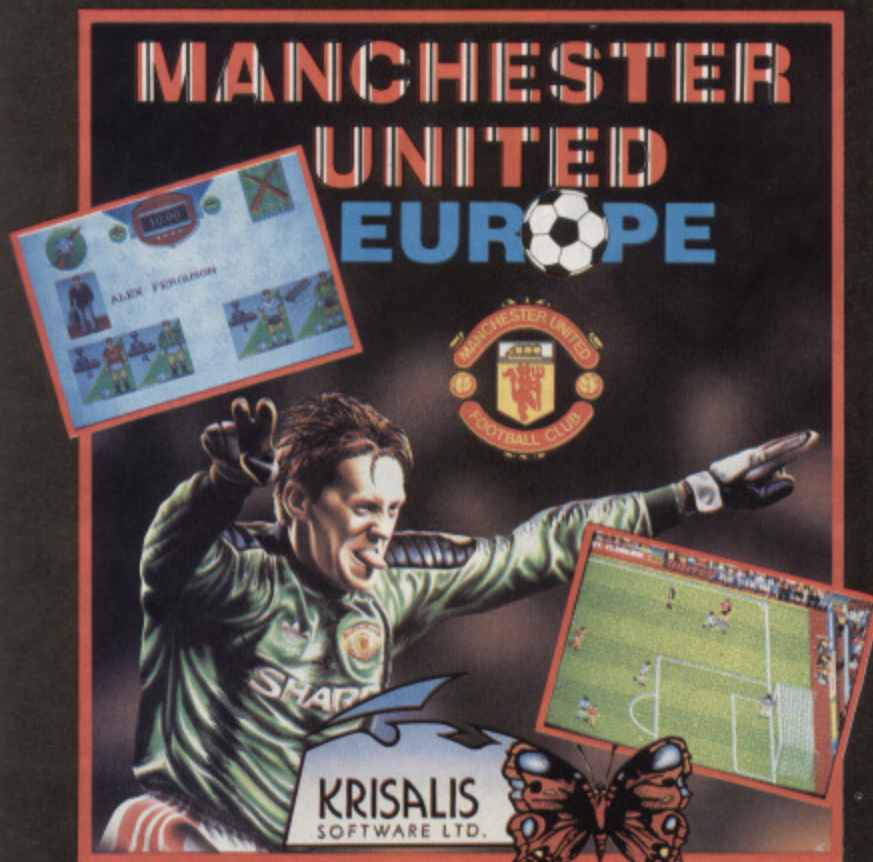




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If this game wasn't so fashionable in style it would be out-modishly 60's. However, as peace, love and caring are back in favour – thank goodness – then Top Banana is at the cutting edge. Though dealing with serious issues, the game is fun and doesn't take itself seriously leaving you with a difficult, addictive and a thoroughly superb working of that old blast from the past – the platform game. The T-shirt is pretty good too.

The theme is one of greed and destruction and is, unfortunately for Earth, not too far from the truth. Yet in the belief that love and competent programming can overcome all you must guide our hero through four increasingly difficult and weird worlds.

Graphically it's a mix of Monty Python, Sergeant Pepper and garish psychedelic colours. Add to this the noises of the rainforest and other sound effects as you munch your way through the various goodies and you have something that assaults the senses from all angles. Good though the sound is I was pleased to see a quiet and off option.

Starting in the rainforest you must kill bulldozers, chainsaws and suited businessmen with kindness before the rising water level reaches you. Eat as you go or the screen will begin to shake as you

become weak from lack of food.

The game boasts three-way parallax scrolling which just adds to the totally weird experience of it all. Do read the manual – strange concept I know – as it does give you some hints. With aching fingers I made my way to the top of the screen only to be cast down amidst a very personal thunder storm – help.

After saving the forest though you can either reassure Greenpeace or take on the hazardous metal city of level two. There are lifts but they are unreliable, and platforms but some are rotten. The water is still rising, but you'll also find hidden pockets of stagnant polluted water – how long can you hold your breath? Mutated metal machines patrol and radioactive waste falls around your ears.

Succeed here and you have only one more step on your way to total enlightenment. An increasingly weird level this one – why are there American footballers in a temple? And what are the drops of acid and metal discs which keep attacking. Not to mention the crashed red cars.

But if you want really strange try level four. Children's clown faces kept attacking me and though warned in the instructions that this is a level of delusion and nightmare, I was still unpre-

pared for something that is very, very strange.

The controls are straightforward, the monsters you meet random and if you are proficient enough you can edit the sprites to customise your own nightmares. The music is particularly good and has been generated in real time using Chaos theory so it changes continuously with a plethora of sample sounds at its disposal.

Though a classic platform game, the

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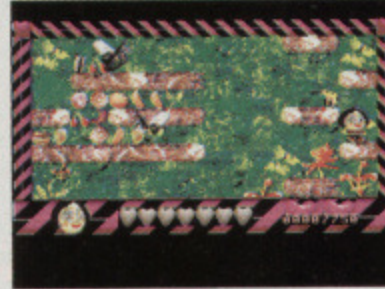
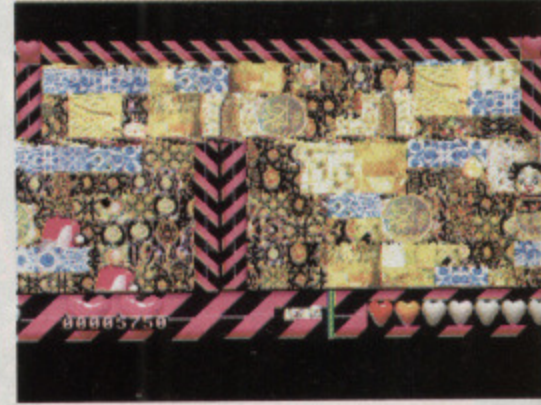
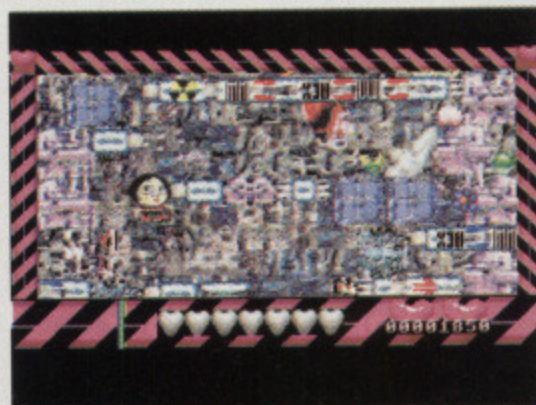
Requirements: BBC A3000 and Archimedes range

polish and sheer detail put into this rendition makes it a sure fire winner. The price may be a little on the high side, but you get a T-shirt and I was glad to see that not only are there no useless bits of packaging and the cardboard is all recycled too.

Polythene Pam

# TOP BANANA

...psychedelic green





**F**OLLOWING a quick scan through the introduction, my first impression of Heart of China was that of a slushy Mills and Boon love story – the hunky hero, “Lucky” Jake Masters, winning the heart of pretty young Kate Lomax, a nurse he has been hired to save from her wicked kidnapper, Li Deng.

Recently released by Dynamix which comes under the umbrella of Sierra, Heart of China is described as “a crash landing, globe spanning adventure”. The cover for the box looks the part, with a picture of Lucky posing on the dockside at Hong Kong, looking every inch the ace fighter pilot he once was.

After tossing the instructions aside for a few minutes I decided to make up my own mind about this 1930's adventure game.

The most obvious thing that struck me was the quality of the graphics, even in 16 EGA colours, and the superb animation. It is worth bearing in mind that a considerable amount of memory is needed for these effects and a hard disk is a must.

A quick dash through the credits and the scene setting will bring you to the Hong Kong docks, where there are boats bobbing on the calm waters of the harbour and the thriving town stretches along the bay. Sea gulls shriek, waiting for scraps they can scavenge while the debris of Lucky Jake's demolished sampan is forlornly scattered in the harbour.

Owing money to millionaire Lomax does not seem to be a good idea, judging by the way the old man treats his debtors, but he does offer Lucky two hundred thousand dollars to save his daughter within three days, of course Lucky has no choice in the matter and reluctantly agrees.

The shattered pieces of the boat are just an indication of the dirty dealing Lomax uses to get his own way, as if his money wasn't enough. Out of the reward money Lomax has offered to Lucky, he will take away twenty thousand dollars for each extra day Lucky takes to save her.

The flying bank notes which occasionally appear fluttering across the screen do not indicate your reward money piling up in your secret Swiss bank account, in fact quite the opposite, the money is flying away due to your lack of speed in rescuing Nurse Kate.

Thought bubbles appear displaying the characters musings which you are able to glean valuable clues from, and, as you work your way around the screen via the keyboard, clicking on an item will give you a full description.

If the pointer passes over a subject and changes shape it usually means



Seagulls bear gifts

...but dont upset the wildlife

# Heart of China

there is something worth looking at, or collecting for future use.

The cursor could change shape for any number of reasons, I would recommend taking note of anything and everything, as something dismissed as unimportant could mean the failure of your campaign.

After searching the dock thoroughly I could see nothing I could possibly want or need and departed via a waiting coolie's rickshaw. It takes you to town and the opportunity of finding a trustworthy partner to assist in the rescue of the fair Kate.

As advised by E. A. Lomax III, you must find Zhao Chi, the only Ninja living in China, to help you with your quest. Chi proves to be somewhat elusive at first, but with a little perseverance and a lot of backchat he will be found, or he'll find Lucky.

You will need to persuade Chi, who is convinced that “arrow-planes” cannot fly, to board your Yankie Eagle and take off for Chengdu, where there is a huge and ancient fortress to explore. Unfortunately it is heavily guarded and there is no way they will let you in without good reason.

To acquire the best possible information you will have to frequently alternate play between the characters, for example when you visit Master Wu, herbalist and document forger



You'll need some help too

extraordinaire, she will not like Lucky's manner and you will have to swap to Chi to get her to talk. The adventures continue through mysterious and exotic lands with various incidents to conquer and problems to solve which done correctly will change Lucky's life and probably Kate's too. Get it wrong and things might not turn out quite as expected.

You can save your game at any point and I would recommend saving your position if danger looms so that if the unmentionable should happen you won't have to start at the beginning again.

Try to remember there is more than one way to catch a fish, so to speak, if you can't do something one way, try another.

Both Lucky and Chi have invento-

ries. You can swap the items between them, pick up useful objects or drop things you don't want. You can also give whatever you pick up to either of the inventories, but it may be that only one particular person can use it successfully. HOC has made such a splash on the PC market that it is well worth looking at on the Archimedes. But it is slow to the point of frustration and the keyboard controls – forget using the mouse – are a little eccentric. However if you long for the heroic daring do's of Romancing the Stone or the Indiana Jones movies then this is a must.

The support materials, concept and programming are of the highest standard, and if you can afford the price and the time you'll be rewarded.

Sue McCarthy



Price: £39.99

Supplier: Sierra, Unit 2, Technology Centre, Station Road, Theale, Reading, Berks RG7 4AA.

Tel: 0734 303322

Requirements: BBC A3000 or Archimedes with new PC Emulator. Hard disc and 2Mb.

... adventure calls



# TOP BANANA

- SAMPLED GRAPHICS
- CYBERMIX SOUND
- RECYCLED PACKING
- EDITABLE SPRITES



## Frantic Fruit Fight to Save the Planet



TOP BANANA is a mega-arcade romp in which you use your power of Love to save our Planet from impending ecological disaster and release hidden hoards of succulent riches. Top Banana includes several totally new gaming features.

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To order Top Banana send a cheque or Postal Order for £25.99 (inc. P&P) payable to HEX addressed to HEX, P.O. Box 737, London SE5 9JG. Credit card holders dial 071 701 0652 for 24hr ordering service. For each extra T-shirt please add £6.99.





## Design Concept

A range of original Outline Fonts for the Archimedes harnessing the power and flexibility of the Acorn Font Manager.

Ainslie  
Ainslie.Bold  
Beacon  
Copper  
CELTIC  
Flip  
Goffik  
Katiyo.Bold  
Trust  
Trust.Solid

*Italic versions, and other font families, are also available from our catalogue.*

Our fonts are designed on the Archimedes. Although this involves sacrificing PostScript compatibility, this is a small price to pay for the ability to go beyond an over-rated standard.

### Prices:

Any one font: £2.50 (Single user licence)  
Other fonts of the same family name: £1.50  
Site Licence: Twice the single user price.  
Carriage on each order: £2.00

Design Concept,  
30 South Oswald Road,  
Edinburgh EH9 2HG  
Telephone 031 668 4518

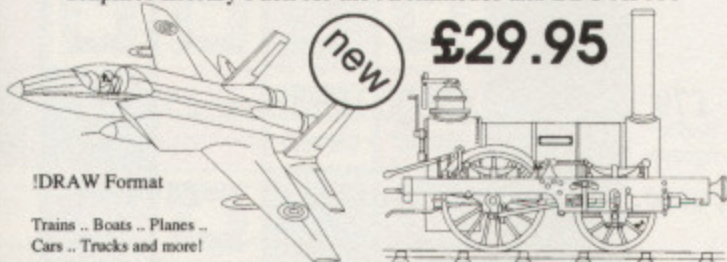


# Micro Studio

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## TRANSPORT

Graphics Library Pack for the Archimedes and BBC A3000



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<p><b>TOOLS</b></p> <p>£29.95</p>	<p>COME AND SEE US AT THE ACORN USER SHOW STAND 74</p> <p>Graphics Packs now include the following Geography, History, Nature, Wildlife, Business, Science, Engineering, Transport, Desktop Publishing, Humour, Design, Illustration, Leisure.</p> <p>Please send an SAE for details.</p>



# No.1

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# No.1

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Don't miss EMR's great show offers on music software and hardware for the BBC and Archimedes - or those amazing demonstrations!



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# SCSI and IDE Options From The Serial Port

Wouldn't you like to buy a SCSI or IDE system from a company that gives you a wide choice of solutions, honest advice about the best type of card for you and who are always reviewing and improving their customer service? If so you're reading the right advert!

The Serial Port supply the largest and fastest range of cards for the Archimedes - as well as a range of devices including hard drives, tape streamers, magneto-optical and CD-ROM drives.

As well as our standard 8-bit SCSI cards we now have a new 16-bit SCSI card which has just been launched and can transfer data at rates exceeding 2Mb per second - certainly one of the fastest and definitely the best looking SCSI card on the Archimedes! Our Turbo Drives perfectly complement this card with an ultra-low 9ms access time with cache and are covered by a full two year warranty.

Also new to our range is the Turbo Internal A3000 SCSI Card - this uses the same components as our 16-bit card but has been designed to fit inside an A3000 giving higher transfer rates than standard internal cards. Another possibility for the A3000 owner is our 'plug in and go' HardBox solution - this is simply a box containing any full size card, drive and fan that plugs into the expansion port of the A3000 keeping your internal slot free for other upgrades. Contact us for the latest availability information on these options.

Also, to give you peace of mind, all our cards and many of our devices are covered by a full two year warranty - we're that confident about the quality and reliability of our products.

## SCSI Cards

8-bit Full Size	£99
8-bit A3000 Internal	£99
Turbo A3000 Card	£139
16-bit Full Size Card	£139

## Standard Drives

45Mb	£200
80Mb	£300
100Mb	£400

## Turbo Drives

50Mb	£250
100Mb	£450

External metal case complete with PSU and fan £79

A3000 HardBox £55

Syquest Removable 42Mb drive complete with PSU, case, fan and one cartridge £499

Sony Magneto-Optical Drive £3800

When a card and any device are bought together all necessary connecting cables will be supplied.

For information on larger drives or other devices such as tape streamers and CD-ROM drives, as well as availability information on our IDE systems, please contact us.

Educational and dealer enquiries welcome

The Serial Port, Burcott Manor, Wells, Somerset BA5 1NH  
Tel: 0243 531194 Fax: 0243 531196



305/310 Memory - 4Mb £170

High quality upgrade to 4Mb RAM. Retains same ability in scheduling or as your dealer's. In MEMC1s not necessary. Will not obstruct other upgrades (APRIL, larger OS Rom, MEMC1s, external floppy drive) as our board lives under the disk drive bridge. Low cost.

**M**OZAIC Madness is a fascinating puzzle game which involves laying many coloured tiles on to a coloured board.

There are only three rules;

- A tile cannot be placed on another tile
- A tile cannot be placed on a space which is the same colour as the tile.
- A tile cannot be placed so that it will have any neighbours horizontal, vertical or diagonal of the same colour.

The game is over when all the tiles have been dropped on to the board. Full instructions are given in the program.

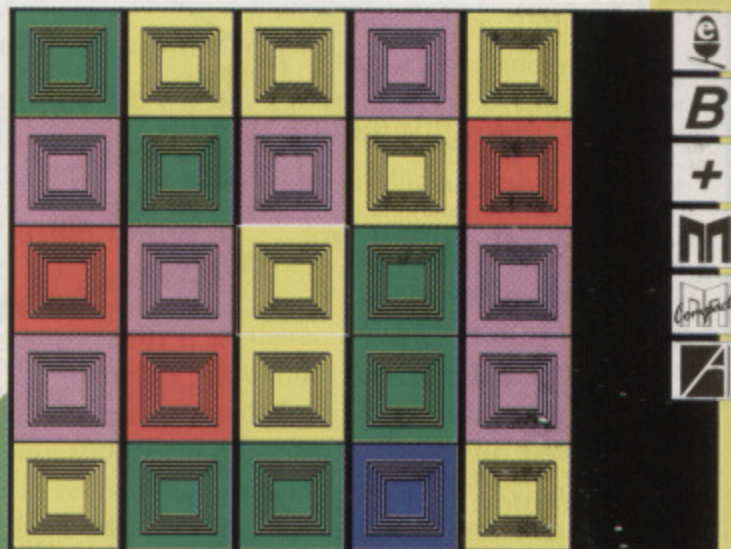
Type in the listing and ensure that you've made no errors using the checksum. Once run the program will ask if you want instructions. After which you must enter the size of the board on which you want to play followed by the difficulty level.

Pressing Escape during the game will return you to the Do you want instructions?

stage. But when checking that the program works, or when you want to finish just use Shift+Escape.

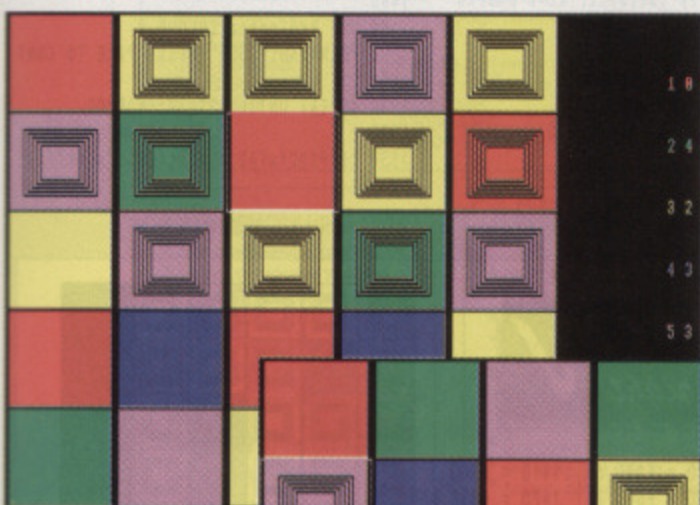
It's best to start with a three by three board at the easiest level, as this provides a good introduction to the puzzle. The two by two grid at the hardest level is an excellent demonstration of how a simple idea for a game with very simple rules can provide a most interesting challenge.

# MOZAIC madness



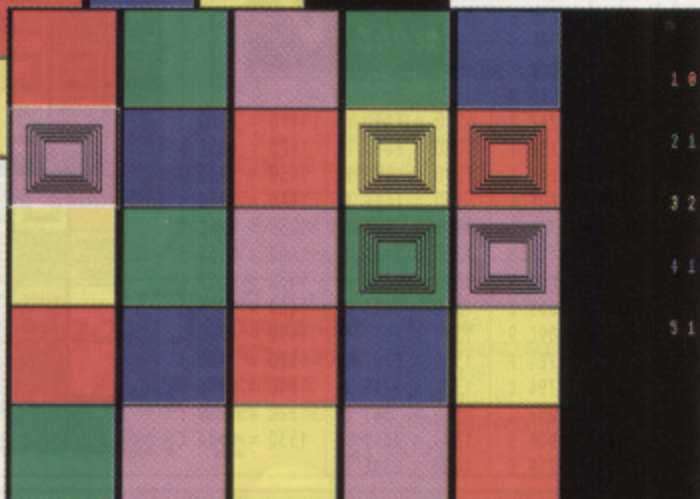
Getting started

*James Bonfield presents  
a frustrating  
puzzle*



Halfway through

No solution here



```

10 REM Mozaic Madness
20 REM by James Bonfield
30 REM (C) The Micro User
40 maxSize=7
50 IF PAGE>8000 maxSize=20:GOTO 110
60 ON ERROR GOTO100
70 *TAPE
80 *SHADOW ON
90 maxSize=20
100 *KEY10SX=FALSE|MOLD|MRUN|M
110 ON ERROR PROCerror
120 MODE1:VDU23,1,0;0;0;0;
130 PROCinstructions:PROCsetup
140 IF PAGE>8000 MODE12:xx=76 ELSE MO
DE2:xx=16
150 PROCinit

```







## 305/310 Memory - 4Mb £170

High quality upgrade to 4Mb RAM. Requires some ability in soldering or ask your dealer to fit. MEMC1a not necessary. Will not obstruct other upgrades (ARM3, larger OS-Roms, MEMC1a, external floppy buffer) as our board lives under the disk drive bridge. Low-power consuming, fully buffered, eight-chip design avoids overheating for reliable operation. Full instructions included.

## A3000 Memory - 1Mb £55 - 4Mb £140

Easy-to-fit, plug-in, upgrade to 2 or 4Mb of RAM. Quality sockets enable future user-upgrading to 4Mb by simple replacement of the eight chips, at a cost of £130. Compatible with other internal upgrades. Low power eight-chip design avoids overheating, ensuring reliable operation. Instructions included.

## A400/1 Memory - £35 per Mb

Upgrade to 2 or 4Mb using our easy-to-fit memory packs, with full instructions.

## SCSI Hard Drives at Sensible Prices

Internal quiet and reliable Fujitsu and Seagate preformatted drives, complete with mounting kit, cables and fast 8-bit SCSI podule for 300/400 series.

45Mb - £299 85Mb - £399 135Mb - £499 180Mb - £599

External drives for the A3000 are available with mini-podule but will need our stylish metal case with integral switched PSU and fan for an additional £95.

**Quality Assurance** - everything we sell is fully tested before despatch.

10% educational discount on memory upgrades. Carriage free within EEC. Please make cheques payable to SIMTEC. VAT to be added to UK orders.

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### UNIVERSAL TELETXT ADAPTOR

- \* RISC-OS version multitasks.
- \* Computer controlled tuning.
- \* Download and save pages.
- \* User programmable via SWIs & OS calls.
- \* Unique composite video & audio output.
- \* High performance T.V. front end.
- \* Fully mains powered unit in metal case.
- \* Upgrades available for existing users.

The ARC/A3000 version contains many powerful features making it very easy to use, i.e. point and click at page numbers. SAE for details.

Prices include:-  
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User notes  
BBC B  
£77.00

Parallel port lead  
TTX V1.08 S/ware  
User notes  
A3000/ARC  
£77.00

Podule socket lead  
TTX V2.11 S/ware  
User notes  
A3000/ARC  
£77.00



Reviewed in Acorn User, June 1991

### A3000 MEMORY UPGRADES

- \* Low power design, only 8 chips.
- \* 1 Meg upgradeable to 4 Meg.
- \* Easy to fit, just plugs in.
- \* Screw fixed for reliability.
- \* PCB size only 175 x 50mm.

1 MEG £70.00 inc VAT & P+P  
(Gives 2 Meg total memory)

4 MEG £160.00 inc VAT & P+P  
(Gives 4 Meg total memory)

NOTE: Memory prices fluctuate,  
please phone for our best quote.

SAE for full details

### ARM 3 PROCESSOR

- \* Cache operation at 25 MHz.
- \* RISCOS !Armspeed software.\*
- \* 3 + times speed increase.
- \* DIY plug in design.
- \* Fits A300/400 series.

£299.00 including VAT + P&P

### A305/310 4 MEG MEMORY UPGRADE

- \* Low power 8 chip design.
- \* DIY fitting, just plug in.
- \* Accepts our ARM 3 processor.

£260.00 including VAT + P&P

SAE for details of above products

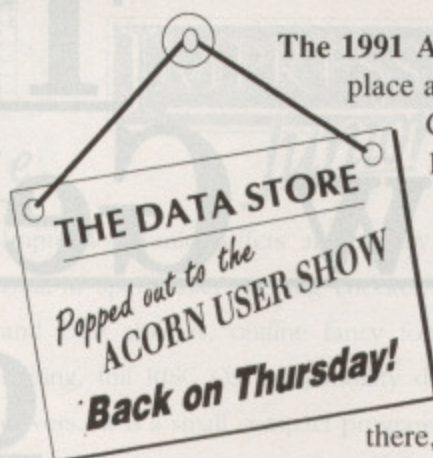
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WELCOME

# A VOID BROMLEY!



The 1991 Acorn User Show takes place at Wembley Conference Centre from 11th to 13th October and we'll be on stand 113 with a wide selection of products and some new Data Store Software releases! BUT whilst we're there, we are closing our

Bromley showroom for refitting. In fact, we'll probably be closed from *Wednesday 9th till Wednesday 16th October inclusive*, but just in case we manage to reopen more quickly, we'll be leaving our answerphone on to give the latest information, so please ring before you come. Once we're back, you'll be able to enjoy our famous service and hospitality and our large range of products for all Acorn computer systems in an even more delightful environment - we look forward to seeing you then! Until 8th October, you'll just have to put up with the *old* carpet...

## THE DATA STORE

6 Chatterton Road, Bromley, Kent BR2 9QN.  
Tel: 081-460 8991 Fax: 081-313 0400

## Thinking of upgrading your A310?

*Our memory upgrade is ...*

**Reliable** - We have been adding extra RAM to 300 series computers for nearly two years. In that time, not a single upgrade which we have fitted has developed a fault and needed repair!

**Upgradable** - Larger RISC OS ROMs can easily be installed later by the user. Simply plug in the new chips and change some links.

**Compatible** - The upgrade works with ARM3s and of course hard discs too. The MEMC1a upgrade is also included, worth over £80. 8-chip design ensures no overheating problems.

**Easy to use** - There are no special commands to remember. Your A310 has a full 4096K (4Mb) of RAM available, just like a 440/1.

**For £375 including VAT you get:** Collection of your machine, fitting and testing of the 4Mb RAM upgrade (with MEMC1a), and return of your computer, 3-day turnaround. Eg a computer collected on Monday is usually back with you on Wednesday.

**Full warranty and a no-quibble money back guarantee.**

Send for our free information sheet. Then decide.  
Phone for educational and quantity discounts.

**A3000** - Only 8 RAM chips - low power consumption  
- User fittable - no soldering required  
- Available as a "bare board" (ie sockets, but no RAM)  
- 4MB - £175 2MB - £65 Bare board - £30

All prices include VAT



Further information and price list from:



IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD  
(0752) 847286

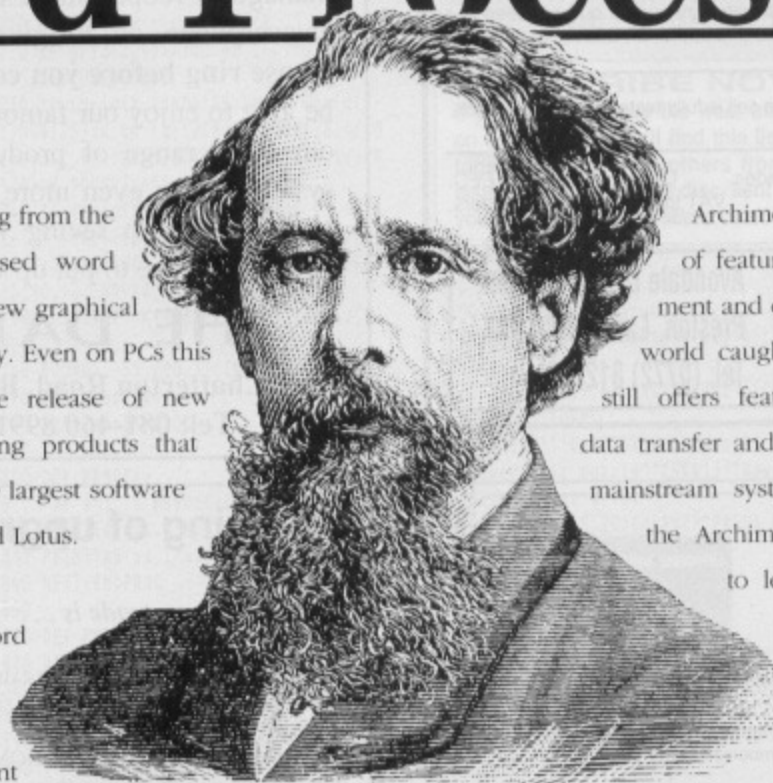


# The New Generation of Word Processors

**W**ord processing is evolving from the traditional character based word processors of the past to the new graphical based word processors of today. Even on PCs this evolution is evident with the release of new graphic based word processing products that run under Windows 3 from the largest software houses Microsoft, Wordstar and Lotus.

The new generation of word processors all have certain features in common. They all allow free use of different text sizes and styles. They all offer a range of graphic manipulating tools and, of course, they all operate under a windowing environment.

While most PC users are only just coming to grips with the new style of word processing, Archimedes owners have been able to word processes like this for 18 months With the introduction of Impression.



***This image (an old engraving of Charles Dickens) was captured using Scan-Light Junior at 400 dpi. This scanner is ideal for black and white line-art or pictures such as this.***

Archimedes owners have had the use of features like a good WIMP environment and outline fonts (long before the PC world caught on). And today the machine still offers features such as inter-application data transfer and font anti-aliasing that no other mainstream system can provide, ensuring that the Archimedes architecture will continue to lead the way. Quite simply, on the Archimedes, you get tomorrows PC architecture today.

With the release of the new greyscale scanner, Computer Concepts can now supply all the components for Archimedes owners to put together the ultimate word processing system.

Our hardware and software products support all three stages of document production, from capturing pictures, through word processing and document creation to printing.



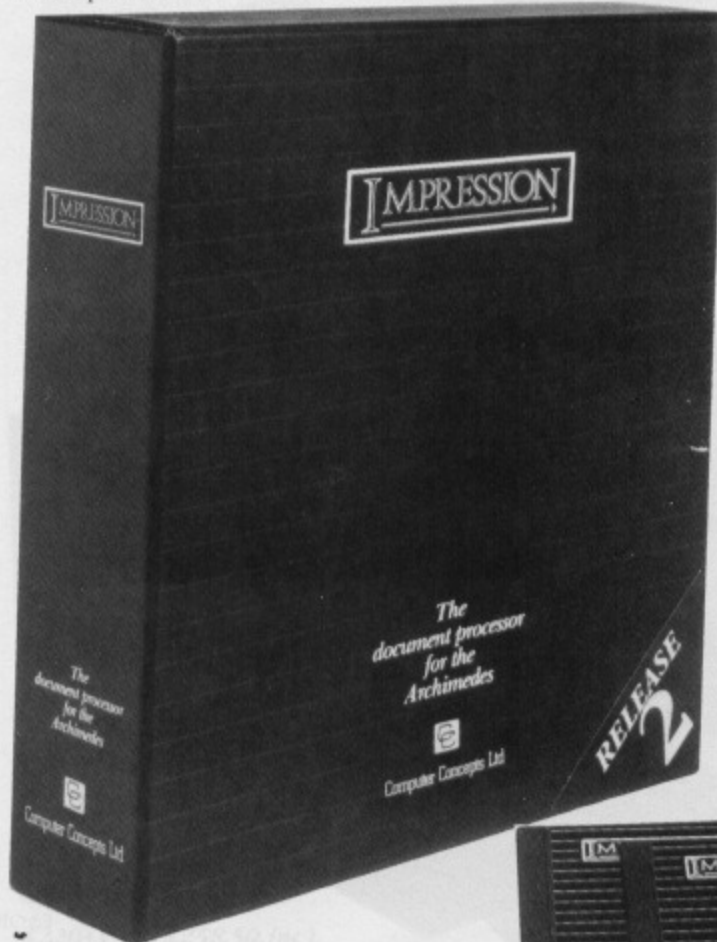


# IMPRESSION



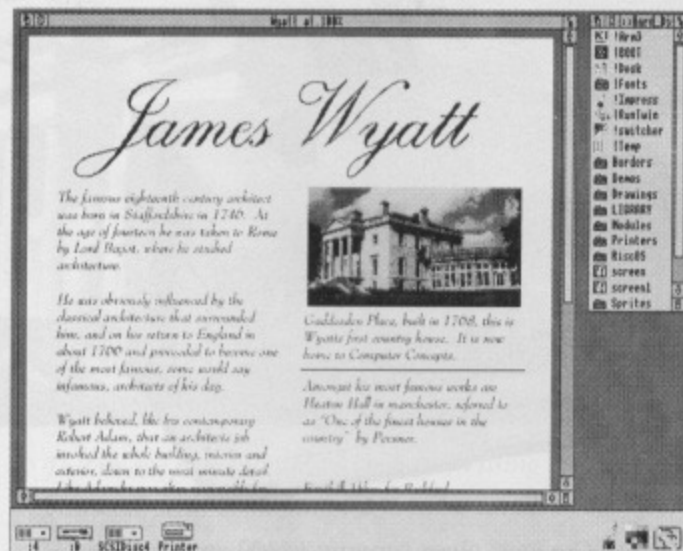
# IMPRESSION Junior

**T**he key part of any system is the word processor. With over 10,000 users (not including the hundreds of educational site-licences installed) Impression Junior and Impression II have become an industry standard for the Archimedes, and it is still growing in popularity. It is probably no co-incidence that the new word processors for other machines are adopting many Impression-like features since it is only logical that, as machines become more powerful, they begin to integrate desk-top-publishing facilities with traditional word processing. Impression is simply the most efficient, compact, fastest product in its class, able to handle the simplest word processing jobs as well as the most complex desk-top-publishing work. It is the only word processor designed to print using either the native character mode of the printer (ideal for text only word processing and dot matrix printers) or using the RISC OS printer drivers for top quality, full page graphics and text. Imagine the freedom of near typeset quality type - any face, any size, any position on the page, with the ability to place diagrams or pictures wherever desired. Impression offers that freedom - perhaps the ultimate evolution of the word processor.



Impression Junior offers all the key Impression features. Built-in SpellMaster spelling checker, full word processing and DTP abilities, outline fancy font and character font editing, full RISC OS compatibility drives RISC OS printer drivers. It is a small compact program ideally suited for the smaller machine.

**Impression Junior £89.95+VAT (£105.69 inc)**



What you see on screen is always an exact representation of the final printed page, including fonts, columns and graphics.

$$J_n(x) = \frac{x^n}{2^n n!} \sum_{s=0}^{\infty} \frac{1}{s!(n+1)^s} \left(\frac{1}{4}x^2\right)^s$$

If your word processing requirements include any equations or formulae then our Equasor product integrates with Impression to allow equations to be built up graphically, then just dropped into the Impression document where required.

Impression II is able to handle longer or more complex documents. Enhanced DTP abilities such as instant graphic rotation to any angle, Drawfile frame borders, and guide frames. It also offers unique features for long word processed documents such as contents and index generation, unlimited document length (not RAM limited), styles, in-line graphics etc.

**Impression II £169+VAT (£198.57 inc)**





Once the pictures and text have been processed and arranged as required, you need to be able to print them to the highest possible quality in the shortest possible time. Laser printers provide the quality but have traditionally been slow and expensive. The LaserDirect range of printers offers not only the highest quality printing available (to 600 dpi) but also offers by far the fastest printing available on the Archimedes and at a lower cost than traditional lasers.



lower cost and can also offer 600 dpi printing for a third of the cost of such printers for other machines.

Indeed, so significant have been the benefits, direct drive lasers have now all but eliminated traditional laser printers from the Archimedes market, with the LaserDirect range being the most popular laser printers with Archimedes owners.

## Integrated solutions

By using the Computer Concepts software and hardware products with the advanced technology of the Archimedes it is possible to create what must surely be the ultimate word and document processing system. A system that allows high quality half-tone pictures to be captured and incorporated into documents, that integrates word processing and desktop-publishing and, finally, outputs top quality laser printed pages.

All Computer Concepts products are available direct from Computer Concepts or from all reputable dealers. More detailed brochures are available for most of our products.



*LaserDirect Qume. 6 pages per minute 300 dpi. (2Mbyte machine required.)*

**LaserDirect Qume £999+VAT (£1173.82 inc. Postage extra)**

Direct drive laser printers are not a new idea. Apple Mac users have been able to buy direct drive printers for their computers for some time, but while these printers are low cost, they have the reputation of being slow. Here again Archimedes owners win because their machines have the necessary processing power to eliminate the speed problem, and the operating system facilities (such as outline fonts) to ensure that what you see on screen is really exactly what you will get on the printed page. LaserDirect printers offer print speeds of 5 to 10 times that of a typical LaserJet, at a

*LaserDirect HiRes. 8 pages per minute and 300 or 600 dpi. (4Mbytes recommended for 600 dpi.)*

**LaserDirect HiRes £1495+VAT (£1756.62 inc. Postage extra)**



**Computer Concepts Ltd**

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All trademarks acknowledged  
Educational discounts available



**W**hile the Archimedes is powerful enough and flexible enough to handle graphics with supreme ease, this is only useful if it is equally easy to input graphics. The Scan-Light family of image scanners offers a range of capabilities and prices to suit all requirements.

There are three members of the Scan-Light family of image scanners. They are supplied with interface board and simple-to-use software. (Versions are available to fit internally in the A3000). And thanks to direct data exchange, once a picture has been scanned, it can be dropped directly into an Impression document (or other applications) without having to bother with filenames or having to save, then re-load as would be necessary in other systems.



*capture*

The Scan-Light software includes many unique features such as instant rotation of the scanned image to any angle, image sampling to produce true grey-level images from black and white scanners, full grey-map control to alter contrast brightness etc. Over the last 18 months the Scan-Light series has become the most popular available with all types of users - home users, professional, and educational.



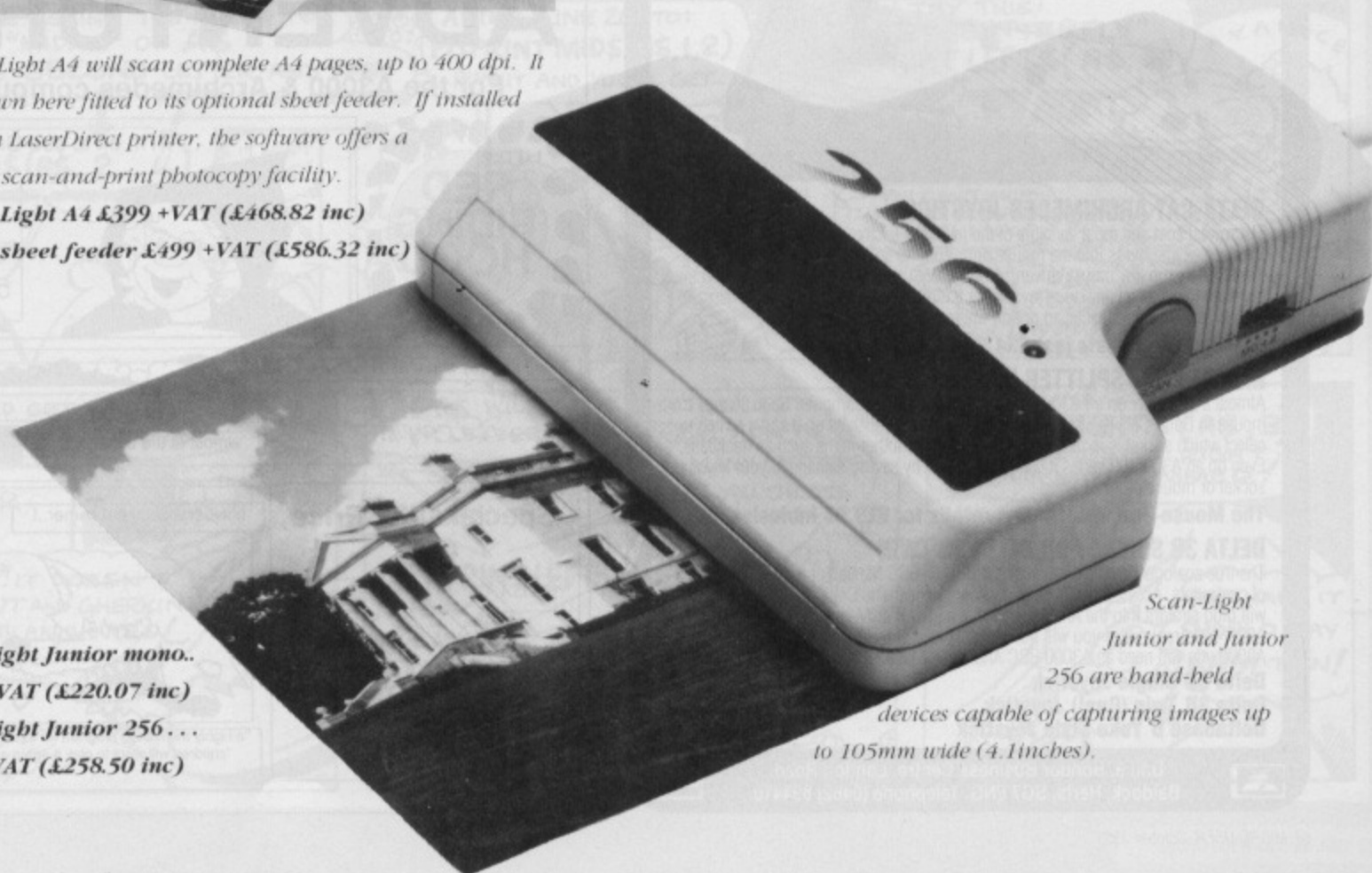
*Scan-Light A4 will scan complete A4 pages, up to 400 dpi. It is shown here fitted to its optional sheet feeder. If installed with a LaserDirect printer, the software offers a quick scan-and-print photocopy facility.*

**Scan-Light A4 £399 +VAT (£468.82 inc)**

**With sheet feeder £499 +VAT (£586.32 inc)**



*This image was captured from a print using the new greyscale Scan-Light Junior 256. This is able to capture, display and reproduce stunning quality half-tone photographs, although it can also scan black and white images at up to 400 dpi.*



**Scan-Light Junior mono..  
£189+VAT (£220.07 inc)  
Scan-Light Junior 256...  
£220+VAT (£258.50 inc)**

*Scan-Light Junior and Junior 256 are hand-held devices capable of capturing images up to 105mm wide (4.1 inches).*





# Desktop Folio

## Not just a desktop publisher...

For  
Archimedes  
and A3000

Choose Desktop Folio, the versatile word processor, desktop and interactive publisher in one. Suitable for home or school work for all ages, from primary level to adult. Perfect for professional quality newsletters, reports, letters, posters, illustrated stories and much more.

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Private customers: please send cash with order. Schools: the goods will be sent on credit upon receipt of order attached to official letter head. P&P is FREE on this order but please add 17.5% VAT to total. Send to: ESM, Dept 10, Duke St, Wisbech, Cambs PE13 2AE.

Please send me ..... copies of Desktop Folio (standalone) @ £90 each.

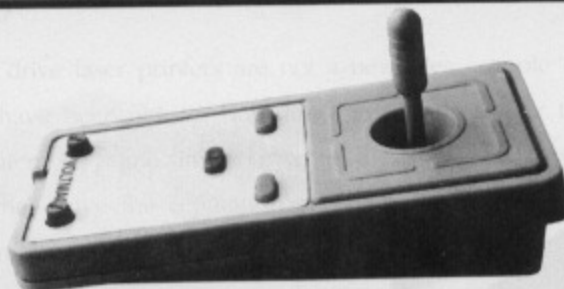
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Name ..... Position .....

Address .....

Signed .....

## VOLTMACE



### DELTA-CAT ARCHIMEDES JOYSTICK

The lowest cost and most versatile of the joysticks for the Archimedes. Needs no interface — just plugs into the mouse port. With no software changes it will immediately run any mouse driven software. With specially written software it can be made to act as an analogue joystick or a digital joystick. All good software should have this joystick as an option where relevant.

The Delta Cat costs just £34.95 inclusive.

### MOUSE PORT SPLITTER BOX

Almost a necessity on an A3000 to save keep lifting the computer up to change from mouse to Delta-Cat. The Splitter Box has two mouse sockets on it and a switch to select which socket is in use. Can also be used for other items such as trackballs. Even on an A300/400 series it can pay for itself by saving damage to your keyboard socket or mouse plug.

The Mouse Port Splitter Box retails for £19.95 inclusive.

### DELTA 3B SINGLE AND DELTA 3B TWIN

The true analogue joystick for either the BBC B, BBC Master, or Archimedes range of computers. Accessed by Basic Advail commands. The Delta 3B series joysticks will plug straight into the Analogue Port of a BBC B or Master. To work on an A300/400 Archimedes you will need a backplane and I/O module. To work on an A3000 you will need an A3000 BBC Analogue + User Port Module.

Delta 3B Single Joystick	£16.95
Delta 3B Twin (Dual) Joystick	£24.95
Deltabase B Yoke Style Joystick	£34.95



Unit 9, Bondor Business Centre, London Road,  
Baldock, Herts, SG7 6NG. Telephone (0462) 894410



Selective Software presents  
An educational

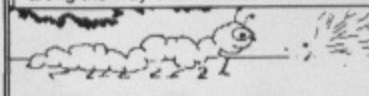
## ADVENTURE

For the A3000 & Archimedes computers



for  
ages  
5 to 8

along the way she makes lots of friends



almost at the cottage..

but just around the corner..!



"a highly motivating program for infant school age."  
"children will want to play it again and again."  
BBC Acorn User

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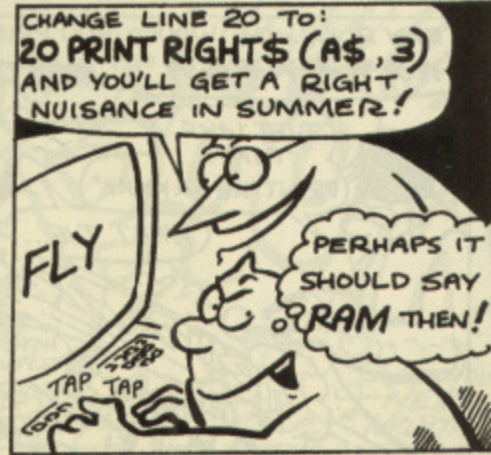
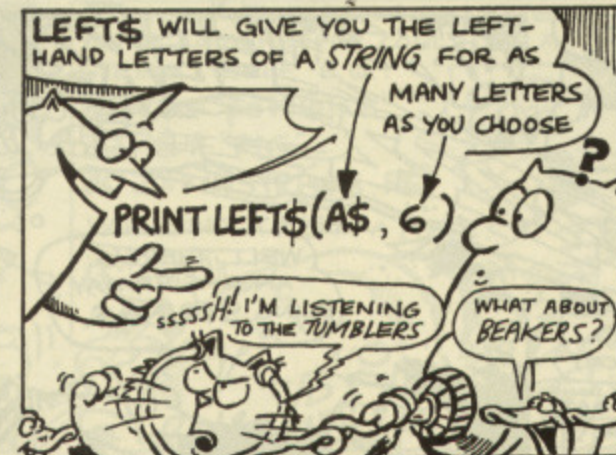
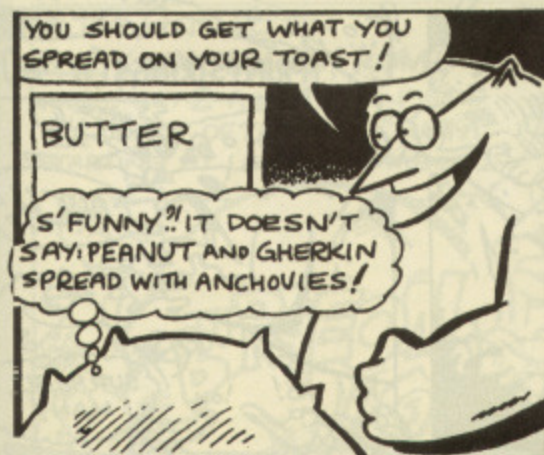
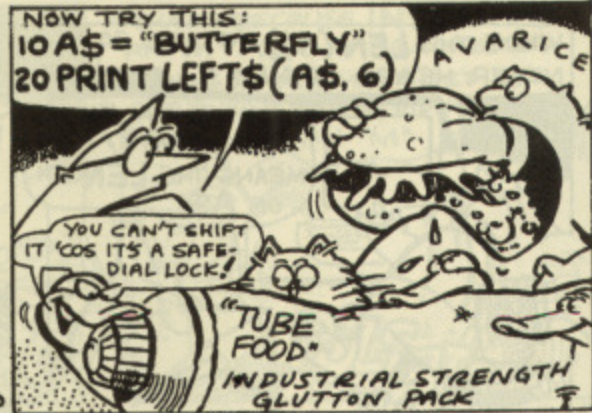
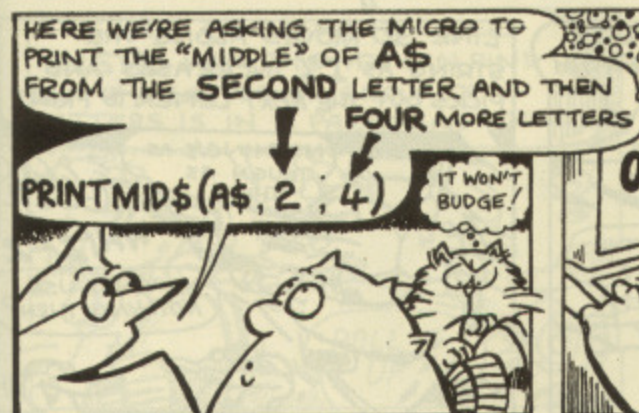
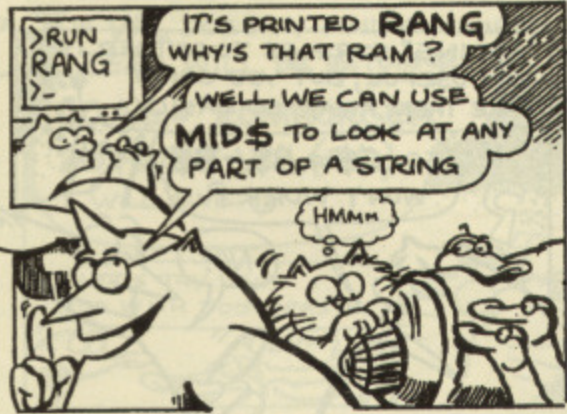
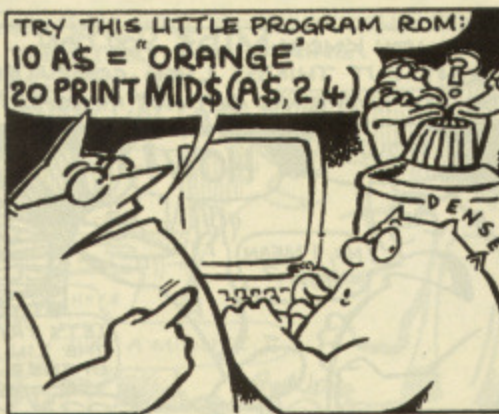
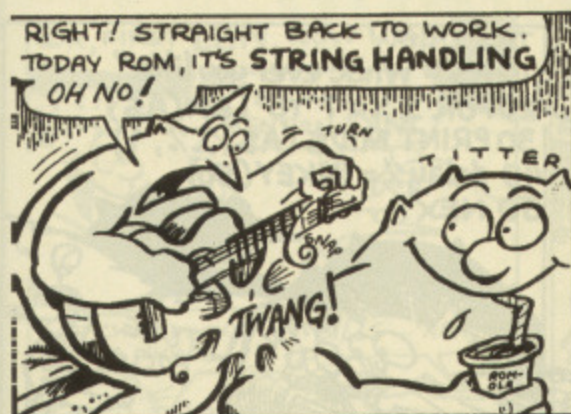
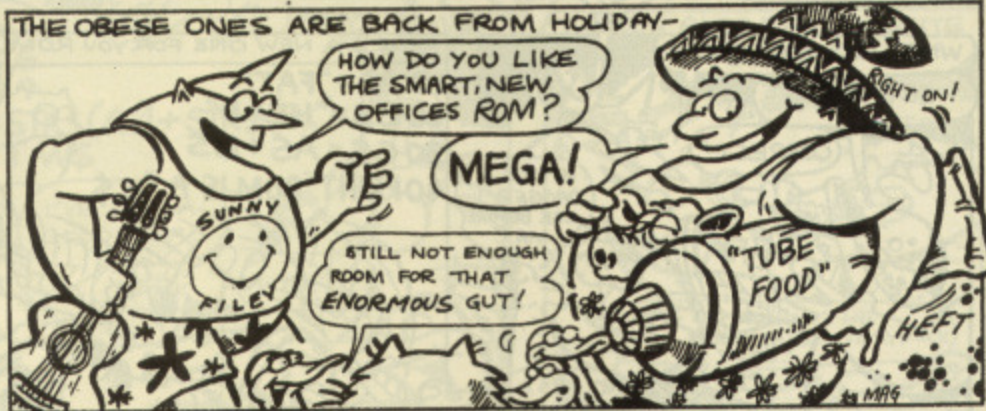
Access

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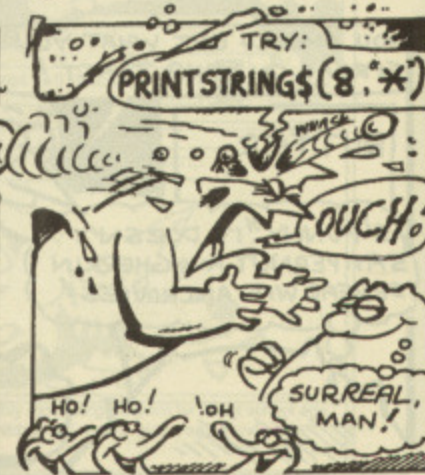
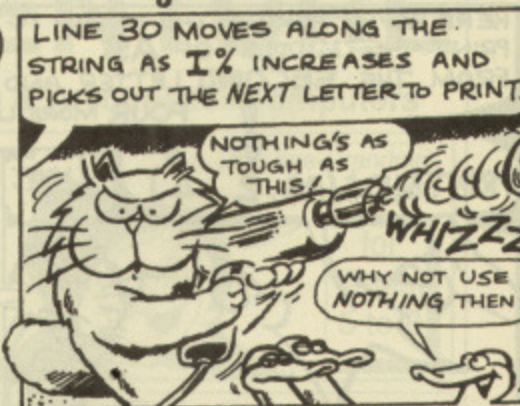
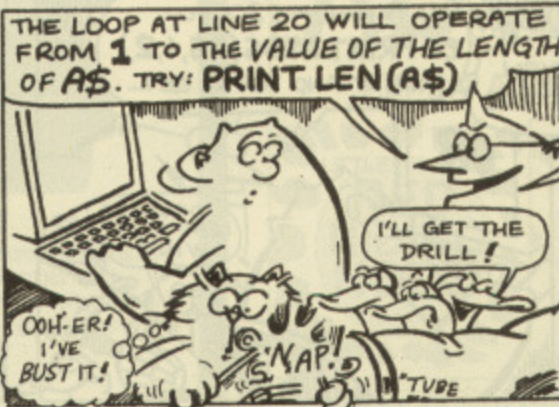
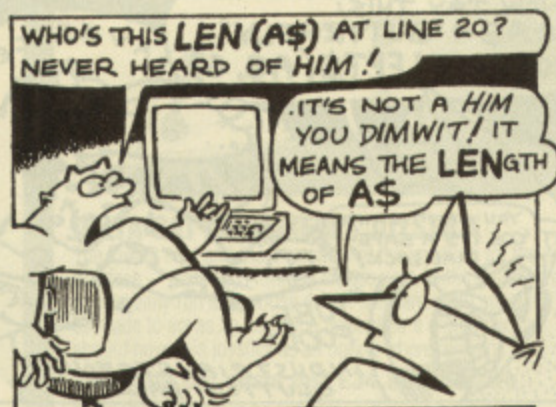
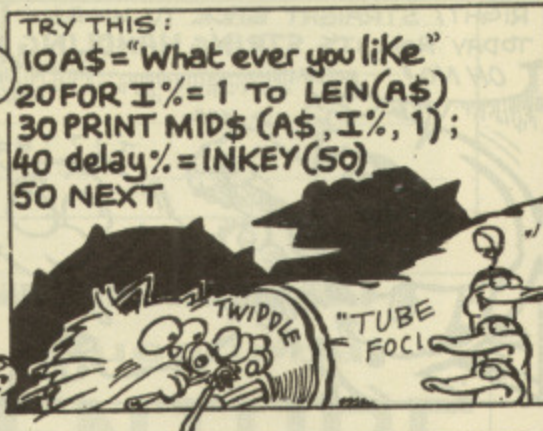
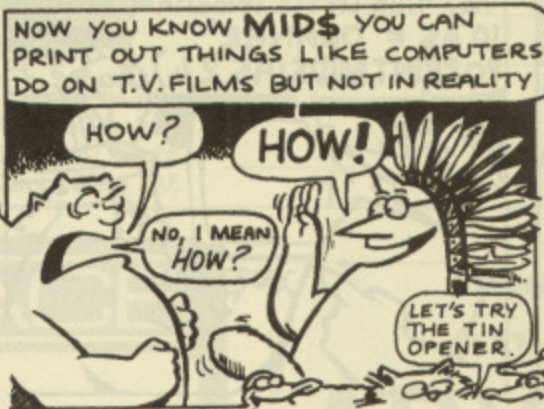
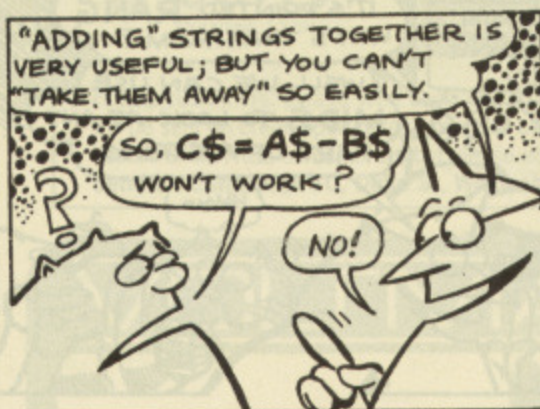
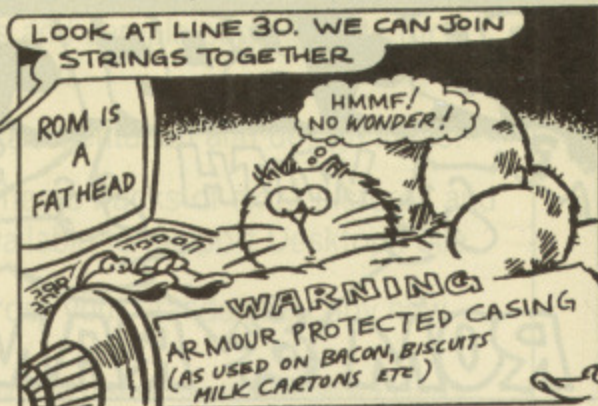
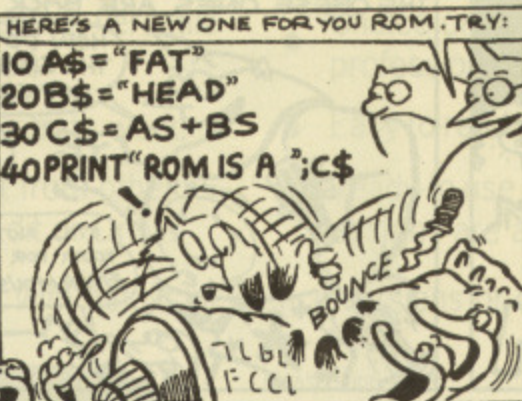
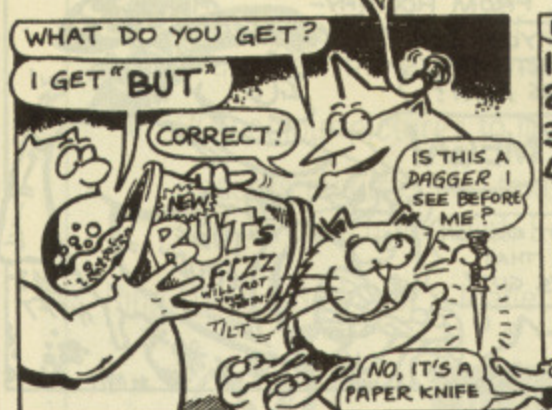
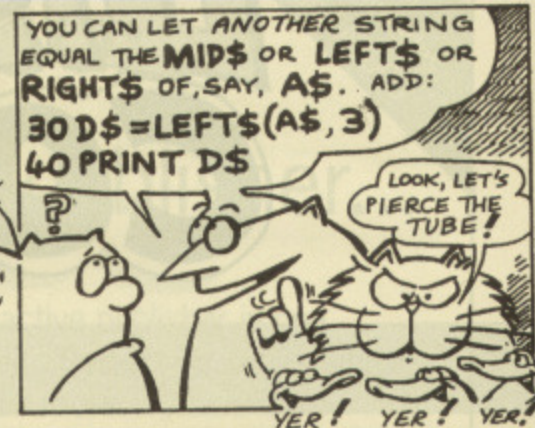
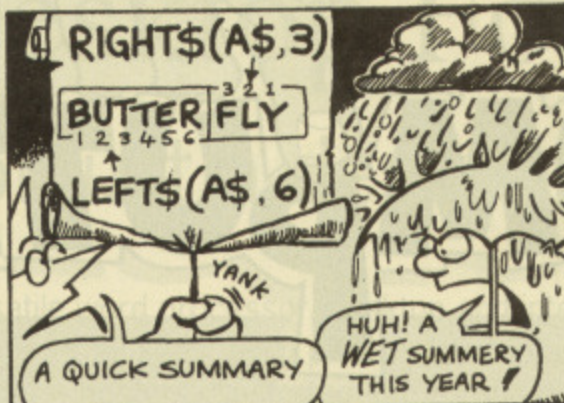
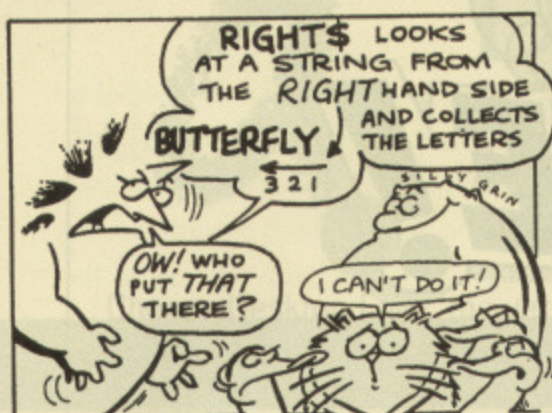


# LET'S COMPUTE!

## BBC BASIC WITH ROM & RAM









TRY:  
10 A\$ = "LO"  
20 B\$ = STRING\$(3, A\$)  
30 PRINT B\$  
TO HEAR WHAT THE  
POLICEMAN SAID TO  
THE BURGLAR!

IT DOESN'T SAY:  
"YOU'RE NICKED!"

I'VE HAD ENOUGH  
OF BILL JOKES!

STRING\$(7, "letters") WILL  
PRINT ANY NUMBER OF COPIES  
OF A STRING  
OR WORD

MIOW!

CAN WE  
DO ANOTHER  
VISUAL JOKE  
ABOUT THESE  
TRIANGLES ROM?

NO, NOT  
EVEN THIS  
VERBAL ONE.  
THE EDITOR  
SAYS SO!

THE WAY, YOU CAN MAKE  
NUMBERS BEHAVE LIKE LETTERS  
USING STR\$. FIRST, TRY:

10 A% = 6  
20 B% = 9  
30 W\$ = A% + B%  
40 PRINT W\$

SLURP

NOW TRY:  
10 A% = 6  
20 B% = 9  
30 W\$ = STR\$(A%) + STR\$(B%)  
40 PRINT W\$

I'VE GOT A  
GOOD IDEA.

YER?

WHAT?

THERE'S ALSO THE OPPOSITE  
FUNCTION TO STR\$ CALLED  
VAL

LET'S GO DOWN THE  
CHIP SHOP LIKE EVERYDUCK  
ELSE!

POOR LOOK  
LOOK LIKE

COR, FIRST LEN, NOW VAL

EXCITED

YES, NOT TO  
MENTION DIM

IT'S ALL THESE  
BILLS - AHA??

NO CHIPS, DUCKS!  
WE'RE SKINT!

ANYWAY VAL WILL GIVE YOU THE NUMBER  
AT THE START OF A STRING. TRY:

10 A\$ = "7UP"  
20 PRINT VAL(A\$)

7

SHOVE

JUST A MINUTE...

IF VAL DOESN'T FIND A NUMBER  
ZERO WILL BE RETURNED. SO:

10 A\$ = "ROMBURGER"  
20 PRINT VAL(A\$)

WILL GIVE 0

LET'S TRY WHAT I  
DO WITH TOOTH PASTE!

EH?

THIS LAST COMMAND IS CALLED  
INSTR. WITH THIS YOU CAN FIND  
OUT IF A LETTER OR GROUP OF  
LETTERS IS IN A PARTICULAR STRING

NUDGE

ROLL IT  
UP!

TRY:  
10 A\$ = "AROMA"  
20 L% = INSTR(A\$, "M")  
30 PRINT L%

I GET 4

BURGEON

THAT'S BECAUSE INSTR FOUND  
AN "M" FOUR CHARACTERS  
ALONG IN A\$ YOU'D GET 0  
RETURNED IF INSTR DIDN'T FIND  
AN "M"

PULSATE!

ALTER LINE 20 TO:  
20 L% = INSTR(A\$, "ROM")  
YOU'LL GET 2 AS INSTR FINDS  
THE GROUP OF LETTERS "ROM"  
STARTING AT LETTER NUMBER 2

BURGEON

OF COURSE, THE LETTER OR LETTERS  
YOU'RE LOOKING FOR COULD BE A  
STRING ITSELF. E.G.:

10 W\$ = "poPIGke"  
20 P\$ = "PIG"  
30 I% = INSTR(W\$, P\$)  
WILL FIND A PIG IN A POKE!

BOOM

RIP

SEE YOU  
NEXT  
MONTH!



# 256

## ***Grey-Level scanning***

At last, photographic quality, true grey-level scanning for Archimedes owners. Not only is the quality a significant step forward from 16 grey-levels, the best previously available, but it costs around half the price of the only other true grey-level scanner for the Archimedes. In fact, to the best of our knowledge, this is the lowest priced true grey-scale scanner in the world.

***The new Scan-Light Junior 256 -  
£220 +VAT***



*An example scanned picture, reproduced actual size.*



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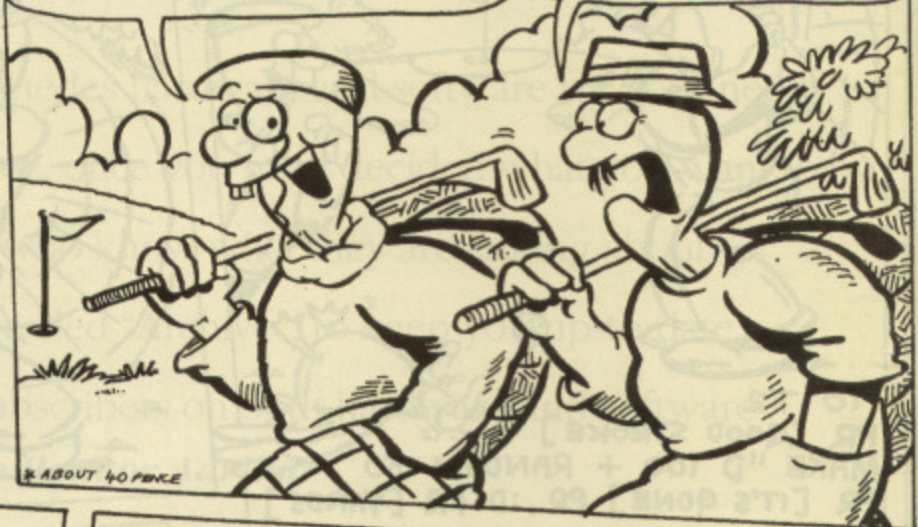
# LOGO LONDOWN



TONY "JACKO" TURTLE AND TRAVINO TURTLE  
ARE PLAYING A ROUND AT THE GOLF COURSE

I SAY TRAVINO, OLD CHAP;  
I'LL WAGER A MONTH'S PAY\* I  
CAN THRASH YOU OVER 18 HOLES

YER? WHO'S THE  
STUNT-TURTLE  
TAKING YOUR SHOTS?

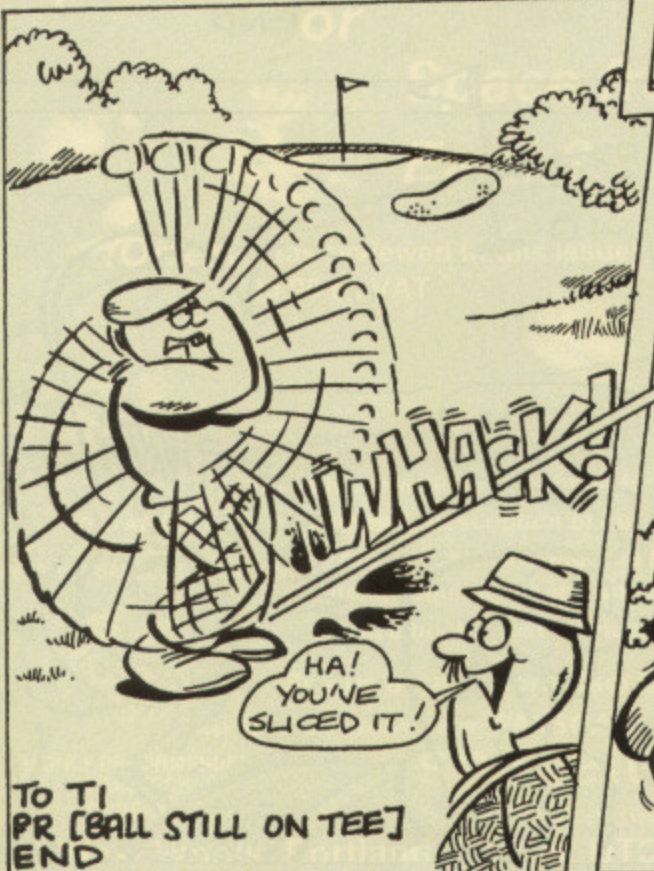


AT THE FIRST TEE

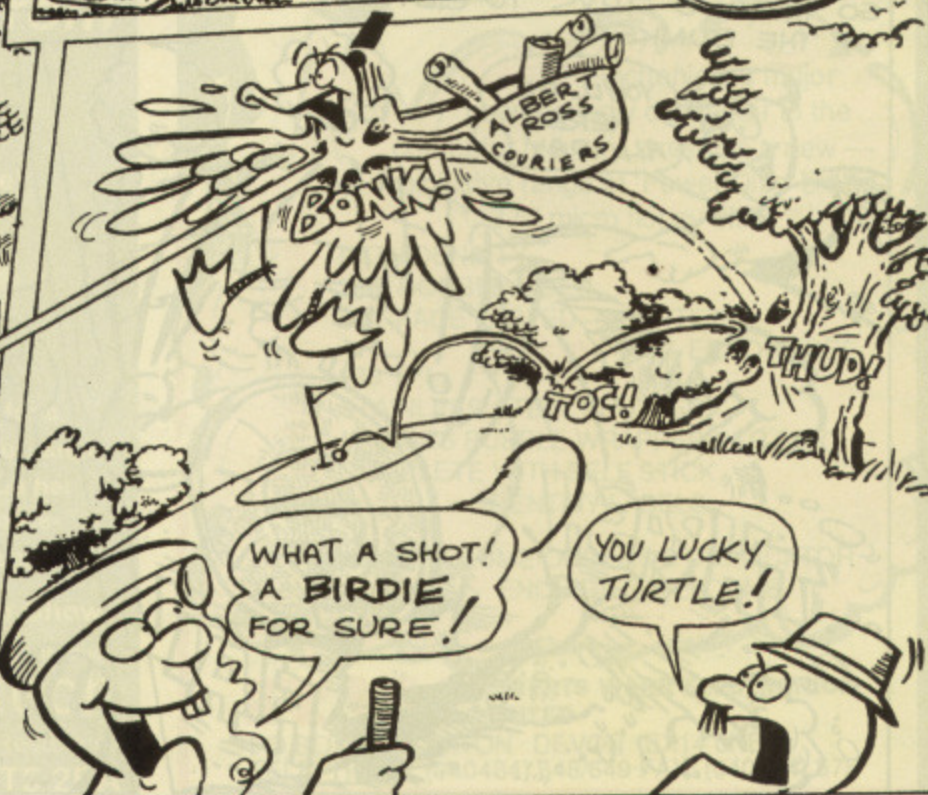
PASS ME THE  
TEE, CADDIE!  
~HA~!

HOW  
AMUSING

```
TO TEE
RND
IF (:R = 0) [T1]
IF (:R = 1) [T2]
OK
END
TO RND
MAKE "R RANDOM 2
END
```



```
TO T1
PR [BALL STILL ON TEE]
END
```





THEN IT'S "JACKO'S" TURN



TO T2  
PR [GOOD STROKE]  
MAKE "D 100 + RANDOM 50  
PR [IT'S GONE] PR :D PR [YARDS]  
END

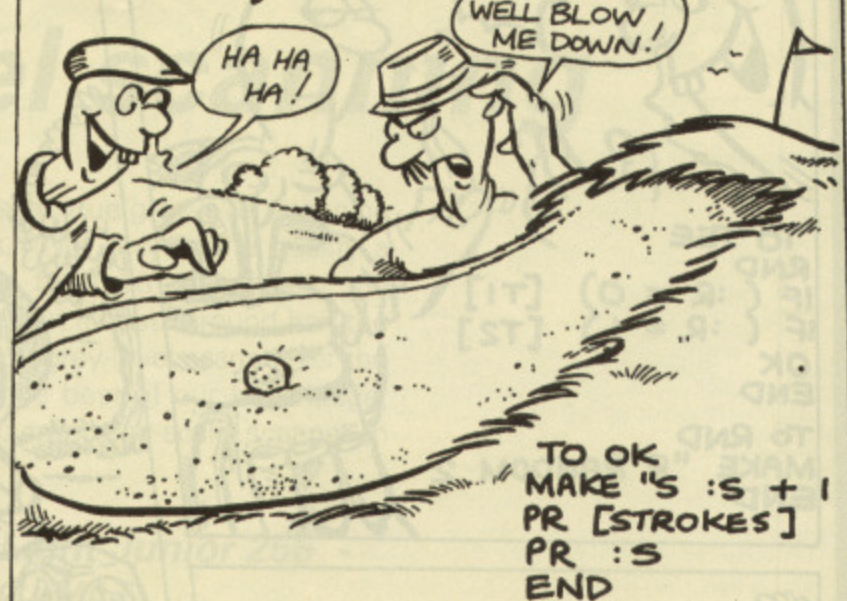
"JACKO'S" SHOT LOOKS LIKE IT'S GOING STRAIGHT FOR THE HOLE.



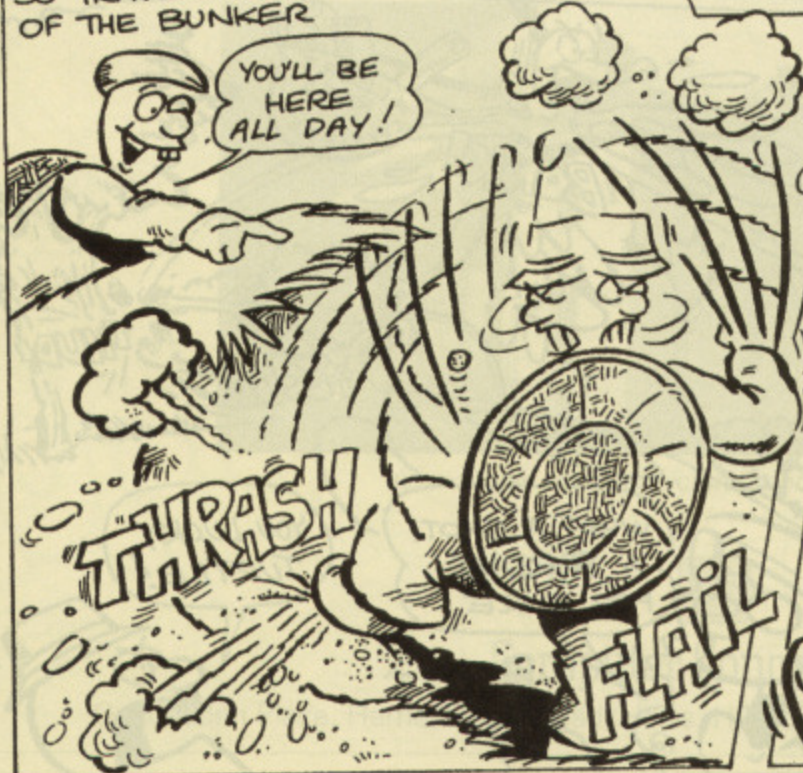
BUT...



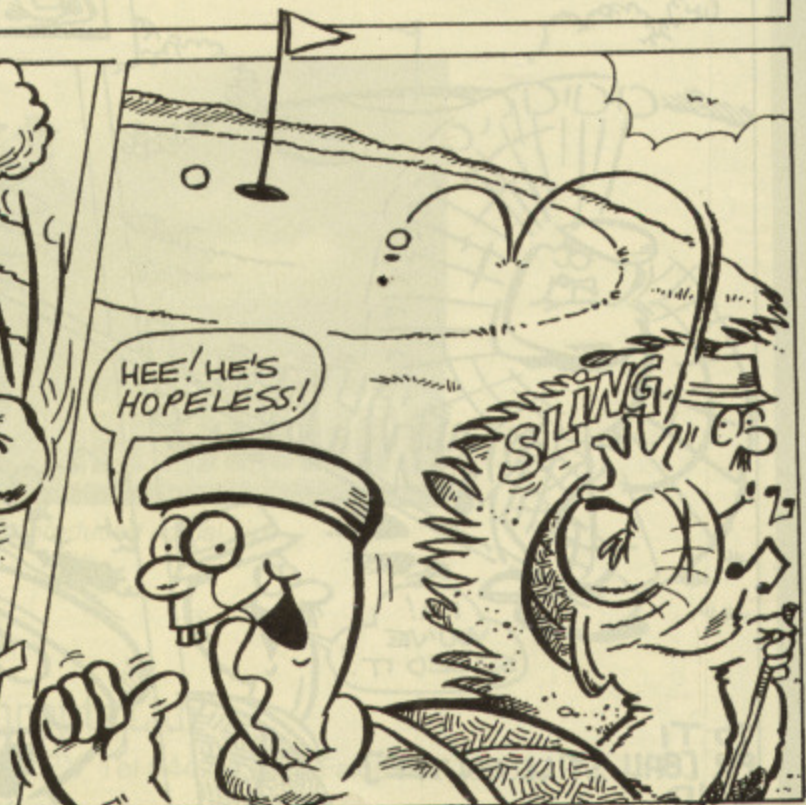
**BUNKERED!**



SO TRAVINO TRYS TO GET OUT OF THE BUNKER



HEE! HE'S HOPELESS!





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## ON THE GREEN



TO CLUB

RND

IF (:R = 0) [PR [NEAR TO GREEN]]

IF (:R = 1) [PR [BALL ON GREEN]]

OK

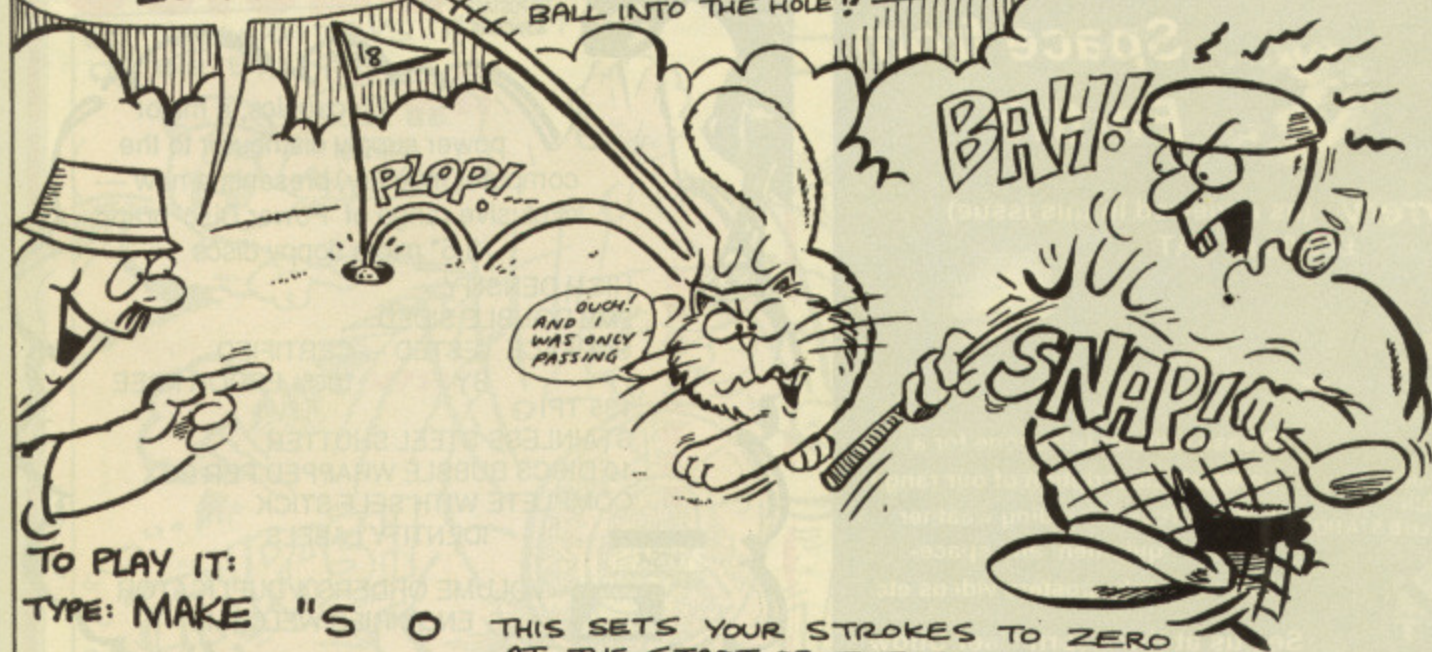
END

BUT BY THE LAST HOLE THE SCORES ARE LEVEL AND TRAVINO NEEDS THIS SHOT TO WIN



NOT SO FAST JACKO - LOOK!

A PASSING CAT INADVERTANTLY KNUITS TRAVINO'S BALL INTO THE HOLE!



TO PLAY IT:

TYPE: MAKE "S O THIS SETS YOUR STROKES TO ZERO AT THE START OF THE GAME.

THEN TYPE TEE <RETURN> UNTIL THE BALL GETS OFF THE TEE.

IF THE BALL GOES A FAIR DISTANCE YOU CAN THEN USE: CLUB <RETURN>

USE PUTT <RETURN> WHEN YOU'VE LANDED ON THE GREEN.

## ☆ TURTLE PROFILE ☆

TONY JACKO<sup>99</sup>  
TURTLE-GOLFER

FACTS:

HEIGHT: ABOVE PAR (FOR THE COURSE)

EYES: TWO, (A HOLE IN ONE)

HAIR: SMOOTH, NOT ROUGH

CLOTHES: LOUD AND TASTELESS (CHECKOUT THE PANTS!)

LIKES: GOLF, CRAZY GOLF

MINIATURE GOLF AND GOLF.

DISLIKES: LOSING AT GOLF!

FAVOURITE FOOD: CLUB BISCUITS!

HOBBIES: BORING PEOPLE ABOUT GOLF

"TONY SAYS:

"BE GREEN, AND PLAY GOLF.

IT'S A FAIR WAY TO PLAY A ROUND!"

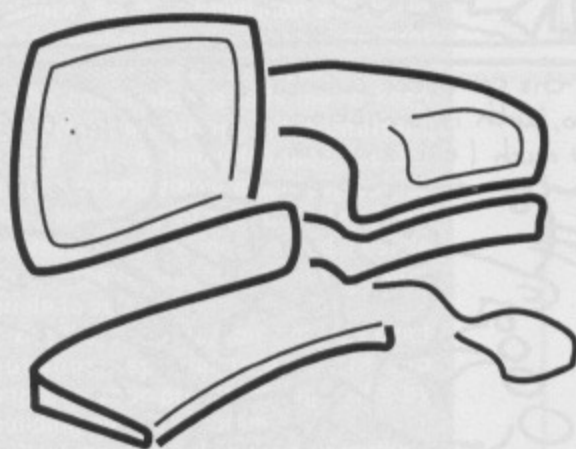


See us at the Acorn User Show  
on Stand 53



## The Archimedes Font specialists

Application			
Frame	↔	Style	Fonts
Edit	↔	Fonts	↔ ✓ EFF Fonts
Style	↔	Text size	↔
Document	↔	Justify	↔
Scale	↔	Colour	↔
		Program	↔
		Program	↔
		Impression	
		Ovation	
		Acorn DTP	
		Draw	
		Genesis	
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		And More...	



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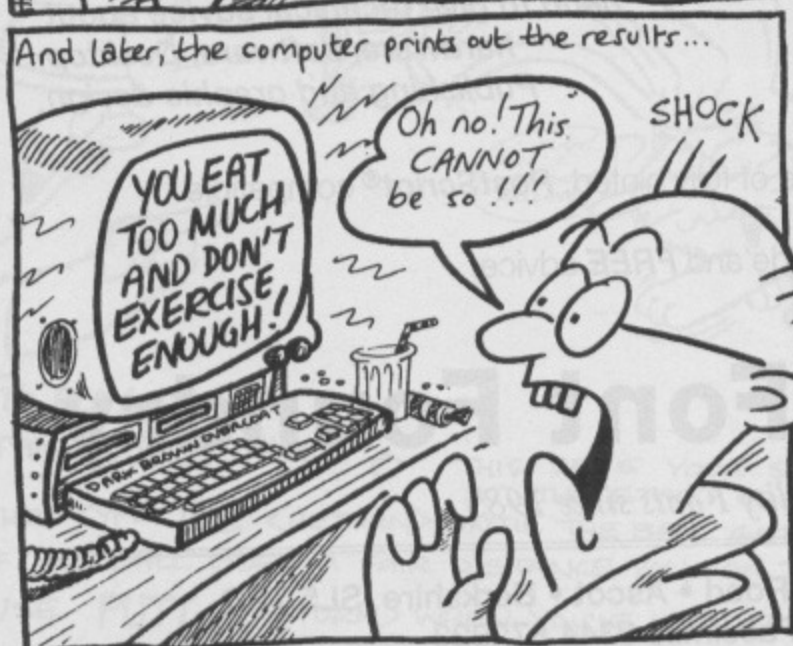
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USE  
COMPUTE!

# The Safe





# Scientist

The experts always say "we are what we eat". This month we have a simple and fun way to find out if you eat about the right amount.

I'll start with a health warning: Don't take any results you get too seriously. They are just a rough guide, because they don't take into account how big you are, how much exercise you do or whether you are a boy or a girl.

My figures come from an excellent little book - The Tesco Guide to Nutrition Information - which gives more than just the energy in food.

If you get one of these free booklets you can find out about protein, fat, carbohydrate and fibre as well.

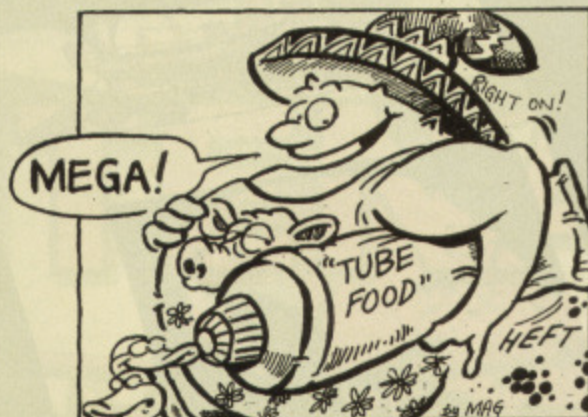
By the time you read this there will be a new National Curriculum for Science. Food and nutrition will be on it somewhere - it's quite a central theme in Science these days.

The editor always tells me to keep my programs short, so I couldn't include lots of fancy features like bar graphs to show how much you eat, or the chance to put in details about yourself like your age, sex and lifestyle so that the result could be more appropriate to you.

But there's no reason why you can't put those special features in and improve your programming skills by building on this program.

Next month we'll generate a multiple choice quiz which will be all about our Earth in Space. See you then.

## A healthy diet



```
10 REM A Good Diet?
20 REM by The Safe Scientist
30 REM (c) The Micro User
40 :
50 MODE 3:VDU19,0,4;0;
60 MaxX=3:TotalX=0
70 DIM food$(MaxX),energy(MaxX)
80 PROCask("Good morning! What do you
want for breakfast?")
90 PROCask("At last! It's morning bre
ak time!")
100 PROCask("Hurrah! It's lunchtime!")
110 PROCask("After school ... how abou
t a snack?")
120 PROCask("It's time for the main ev
ening meal.")
130 PROCresults
140 PRINT"Press Space to try again"
150 REPEAT UNTIL GET=32:RUN
160 :
170 DEFPROCask(q$)
180 PRINT:PRINT:PRINT q$
190 FOR NX=1 TO MaxX
```

```
200 READ food$(NX),energy(NX)
210 PRINTNX") "food$(NX)
220 NEXT
230 PRINT"Choose one";
240 REPEAT INPUTCX:UNTILCX>0 AND CX<=M
axX
250 TotalX=TotalX+energy(CX)
260 PRINT"Press Space to continue"
270 REPEAT UNTIL GET=32:CLS
280 ENDPROC
290 :
300 DEFPROCresults
310 PRINT:PRINT
320 PRINT"Your energy for the day is "
;TotalX" kilojoules"
330 PRINT:PRINT
340 PRINT"You probably need between 60
00 and 8000 kilojoules"
350 IF TotalX>8000 PRINT"You should ea
t less or exercise more"
360 IF TotalX<6000 PRINT"You should ea
t more"
370 IF TotalX>=6000 AND TotalX<=8000 P
RINT"Well done"
380 ENDPROC
390 :
400 DATA "Bacon, eggs and fried bread"
,1500
```

```
410 DATA "A bowl of cornflakes, milk a
nd sugar",1200
420 DATA "Nothing - not enough time",0
430 :
440 DATA "A bag of crisps",800
450 DATA "A Mars bar",1200
460 DATA "Nothing",0
470 :
480 DATA "Lamb, cabbage and roast pota
toes, apple pie and custard",2900
490 DATA "Beefburger, beans and chips
plus a doughnut",3900
500 DATA "Cheese salad and a yoghourt"
,2100
510 :
520 DATA "A packet of peanuts",1000
530 DATA "A cheese sandwich",1000
540 DATA "Nothing",0
550 :
560 DATA "Pork chop, peas and chips",2
200
570 DATA "A couple of sandwiches",1800
580 DATA "Fish and chips",1500
590 :
600 DATA "Another Mars bar",1200
610 DATA "A bag of crisps",800
620 DATA "Nothing",0
```

10 = 0 0	150 = 2C03 6	290 = 9719 B
20 = 0 0	160 = 9719 6	300 = BE11 7
30 = 0 0	170 = 7875 3	310 = C102 E
40 = 9719 9	180 = E70 2	320 = 771E 5
50 = 33B2 0	190 = BA2B 6	330 = C102 0
60 = 1F4B 3	200 = DA2A F	340 = A1B2 9
70 = C627 5	210 = FA37 2	350 = 119C B
80 = 478D F	220 = 2C83 D	360 = B200 4
90 = 6CDD B	230 = 8559 E	370 = 2E72 D
100 = 791F A	240 = 2AA0 6	380 = ED0F 1
110 = A22 6	250 = 92DE E	390 = 9719 A
120 = 120F A	260 = EEDA 1	400 = 3B1E C
130 = 53B7 B	270 = 2823 C	410 = FC53 5
140 = DF34 B	280 = ED0F 7	420 = 9C1B D

Get it  
right ✓

430 = 9719 0	530 = 88E E
440 = 55C2 C	540 = 731C 0
450 = 916 B	550 = 9719 0
460 = 731C C	560 = 476C A
470 = 9719 4	570 = FB34 A
480 = 12FC 0	580 = DC1B 9
490 = 823B 0	590 = 9719 0
500 = 19FE D	600 = 8EC3 3
510 = 9719 C	610 = 55C2 8
520 = 6E1D 7	620 = 731C F



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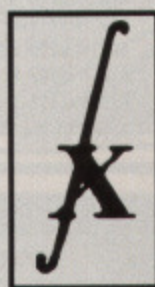


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**T**HE amazing response to our Centenary Competition had the post room reeling with entries pouring in from all over the world.

Even with the huge array of prizes in our hundredth issue, not everyone could be a winner. However, the lucky ones chose from a variety of products from games to hard drives, from office furniture to a trip for two to Paris. This romantic

trip was won by Margaret Rimmer from Coventry. She flew out to Charles de Gaulle airport and whizzed off to the Hotel Splendid Etoile near the famous Arc de Triomphe to explore the sites, sounds and taste of one of the most beautiful cities in the world.

A more lasting prize was the range of Opus furniture won by J. W. Jump of Broughton. With a huge array of tables, chairs and workstations to organise your computer sys-

tem in the most ergonomic way, Opus can arrange even the most disorganised of offices.



*idea*

Envy of his friends must be Charles Pearce from Colsterworth who has now got his own IDE hard drive from Ian Copestake Software – easy to install and excellent value for money. Integrating perfectly with the Risc OS environment, he'll wonder how he ever managed without one.

# CENTENARY celebration

*Readers from all over collect their monster birthday competition prizes*

## MINERVA

Serious users won a selection of the best software around for BBC, Electron and Archimedes. M. Wheeley from Beaconsfield and N. Brown from Cannock can now create their own entertainment courtesy of Creator from Alpine Software, while Major McCloghry from Banbury can keep his desk and table tops clear with DeskTop Office from Minerva.

On the Electron front three copies of Click from Slogger have wended their way to J. K. Fosskett, of Highcliffe on Sea; A. Cossar, Houston and H. B. Overvelde from The Netherlands. While M. Matejtschuk from Abingdon is the lucky recipient of a Plus 1 from Pres.

Also from Pres came an A3000 monitor stand for K. McHalsey from Chessington. Archimedes software consisting of 4Mation's Poster, Clares' Schema and Rhapsody II, Equasor and Impression Junior from Computer Concepts and Quest Paint and Mouse from Watford, plus Archway 2 from Simtron went to:

K. MacGillivray, Kirkhill; L. Pilz, Australia; A. Waterhouse, Otley; N. Saville, Newark; R. Owen, Acton Trussell; C. Barrington Brown, Cranfield; E. Turner, Maidenhead, C. G. Birchfield, Woodley and J. Counsell from Crowborough.

J. C. Haines from London won a Pineapple Video Digitiser with which he can use his Archimedes to multi-task his way to a multimedia experience. As well as grabbing pictures from TV and other sources to add to documents he could also watch his favourite telly programs while doing a spot of writing.

But to download Teletext he'd need a copy of Morley's Teletext Adaptor, of which K. Wise from Stoke Gifford and R. T. Bond from Tiverton are now the proud owners.

Educationally speaking J. Ryan, Galway; Y. E. Baldwin, Buxton and D. Swain from Welwyn have a lot of work on their hands to work through their copies of Fun School 3.

## THE MICRO USER

The following 10 winners have a whole year's reading of the best Electron/BBC/Archimedes magazine to do, as they have each won a subscription to *The Micro User*: A. Mitchell, Sunderland; I. Kershaw, Poynton; H. C. Leivers, Beddau; K. Middleton, Belfast; J. Caulfield, London; T. Gamlin, Hanham; F. L. Davies, Colwyn Bay; C. A. Gaughey, Canterbury; G. Ozdurai, London and T. Thomas from Birkenhead.

An Aladdin's cave of games from Superior, Fourth Dimension, Cygnus, The Serial Port, Minerva and MicroPower have been distributed among: I. Summers, Dartford; D. Rower, Bottesford; B. J. Benson, Newmarket; K. Lawrence, East Bridgford; G. Moore, Farnborough; A. Evans, Bracknell; C. Courtney, Redhill; T. Ngyou, Camberley; D. Tunely, Congleton; A. Moss, Cheadle Hulme; P. Mason, Kemsing; R. N. Carter, Reading; J. Dickson,

Hexham; M. Wright, Croydon; R. Blythe, Newquay; J. S. Wainwright, Tring; M. Cooper, Germany; P. Tasker, Harbury; J. Dhanda, Derby; S. Meers, Welwyn Garden City; D. Cairns, Salford; S. R. Lambert, Southampton; D. Radford, Bolton; D. Hobbs, Sutton Coldfield; A. Houghton, Prescott; D. Millard, Rayleigh; R. Arnold, Worksop; A. Evans, Middlesborough; J. K. Spry, Chatham; M. Ford, Barnsley; A. Brush, Wideopen, R. Gudgeon, Ripon; B. R. Osbourne, Basildon; Stuart Fraser, Houston; A. Cox, Maidenhead; R. J. Glover, Oxford; T. A. Brown, Aylesford; M. Fisher, Wick; P. Cannon, Ellesmere Port; J. A. Schofield, Warash; M. Firth, Whitley Bay; P. Williams, Tywyn; A. J. Griffin, Banbury; A. H. Green, Wigan; P. Rawson, Denmead; N. Dickson, Lincoln; L. McGinty, Ventnor and M. Montgomery from Croydon.



# Ian Copestake Software

September 1991

## ARCHIMEDES SOFTWARE

1st Word Plus	Aco	£62
- manual	Aco	VO £10
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A540 Technical Guide	Aco	VO £65
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## ABBREVIATIONS

Ace	Ace	Datb	Database	Mora	Moray Micro
Aco	Acorn	DatS	Data Store	Mori	Morley
Alp	Alpine	Dom	Domark	Mus	Musbury
Apr	Apricote	Ecl	Eclipse	Oak	Oak
Arc	Arcana	Eiz	Eizo	Pan	Pandora
Arm	Armado	Emr	EMR	Pil	David Pilling
Arn	Arnor	Esm	ESM	Pre	PRES
Arx	Arxe	Ete	Eterna	Rai	Rainbow
Aut	Autodesk	Gem	Gern	Res	Resource
Bai	Baldon Electronics	Gra	Graphics Factory	Sel	Selective
Bee	Beebug	Hum	Human-Computer	Ser	Serial Port
Cal	Calligraph	Hyb	Hybrid	Shi	Shibumi
Cam	Cambridge	Ico	Icon Technology	Sil	Silicon Vision
International Software		ICS	Ian Copestake	Sim	Simtron
Can	Canon	Ife	IFEL	Spa	Spacetech
CC	Computer Concepts	Iota	Iota	Sta	Star
Cha	Chalksoft	Irl	Irlam Instruments	Sup	Superior Software
Cir	Circle	Kad	Kador	Tec	TechSoft
Cit	Citizen	Kri	Krisalis	Top	Topologica
Cla	Clares	Lin	Lingenuity	Ubi	UBI Soft
Col	Colton	Lon	Longman Logotron	Vir	Virgin
ComT	Computer Tutorial	MicP	Micro Power	Wil	Wild Vision
Dabh	Dabhand	MicS	Micro Studio	4ma	4Mation
Dabs	Dabs Press	Mid	Midnight Graphics	4th	Fourth Dimension
		Mit	Mitre	D	Draw format
		Min	Minerva	P	Paint format

Financial Accountant	Sil	£203
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Font Pack	Aco	
- Newhall / Starter / Symbol	each	£35

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Tel: 051-632 1234 Fax: 051-632 3434

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Fitting extra unless stated  
† Fitting is straightforward  
‡ Fitting requires expertise

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A3000 4 Mb †	Ife	£149
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# From contents to index

**S**TAND by to unleash your creative talent, to give a new depth to the written word – with desktop publishing. Whether you want to produce a poster, a pamphlet, a magazine or a book, DTP gives you the power to create a masterpiece or a total disaster, and knowing in advance what will and won't work should save you a lot of time and frustration.

This series introduces you to the delights of frames, styles, fonts, stories, documents and the like which you need to know to put together a professional-looking finished product. All you have to supply is hardware, software and your own ideas.

For the sake of uniformity the series will be based on Impression from Computer Concepts, but other software will be mentioned as appropriate. Almost all of the series will apply equally to Impression Junior, and any differences will be pointed out.

## Lessons from life before DTP

Up to a few years ago, a mix of many skills was required to produce a book or newspaper, in a complex process involving many people. Nowadays, because so many of the processes can be under your control, it may seem to be much simpler.

The combined power of computer and software have been harnessed to give tremendous speed and flexibility. But if you are interested in preparing anything more complicated than a letter you have to take on some of the disciplines developed by the traditional approach – built up over hundreds of years for very good and practical reasons.

Although some of them were more to do with the constraints imposed by the rigidity of metal type, many arise from aesthetics. That means understanding something of the design of the printed page – there are now many visual images competing for people's attention, so if your item looks attractive or compelling it is more likely to be read.

A frame in DTP defines the area of the page that will contain printed matter, be it words or pictures. You may find it a little tricky to get used to the idea of frames at first, but they are the foundation of DTP and you won't get far without them.

Imagine typing a three-column page on a typewriter. The paper would have to be put through three times with the margins set differently each time, and it would be very difficult to make the third column end neatly.

The only alternative would be to type it all out on separate sheets and stick the page together, a

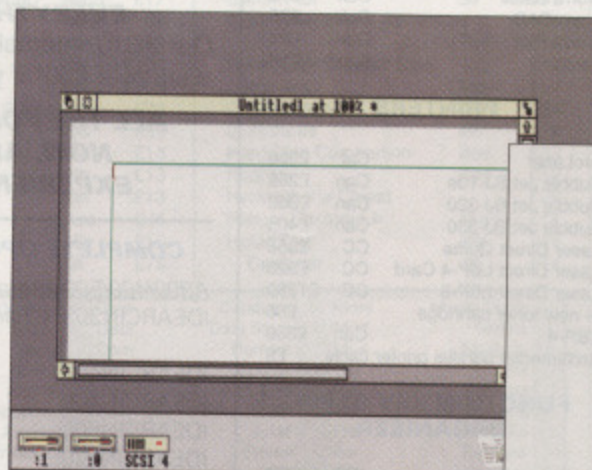


Figure 1: A first view of Impression

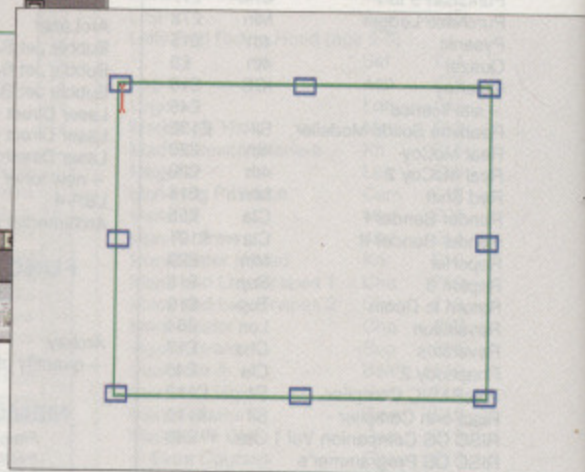


Figure 2: A selected frame

potentially messy and untidy job which is hard to do accurately.

And what if you need to leave holes for illustrations? With DTP there are none of these worries. All you have to do is set up the frames across the page and everything is taken care of.

Let's start by loading up Impression and clicking on its icon to create a new document. You should be faced with a screen similar to Figure 1. Click on the window's toggle size icon at the top right to make it fill the screen. Now move the

pointer around inside the window, and note that it changes shape depending on where it is. Outside the frame it's an open hand – you can push the page around with it – and inside it's a blue caret, which means Impression is expecting text to be entered.

At this point you can't type words in or do anything much because the document is basically asleep. Wake it up by clicking inside the dotted frame: the frame outline changes to solid green and a thin red caret appears at the top left of the

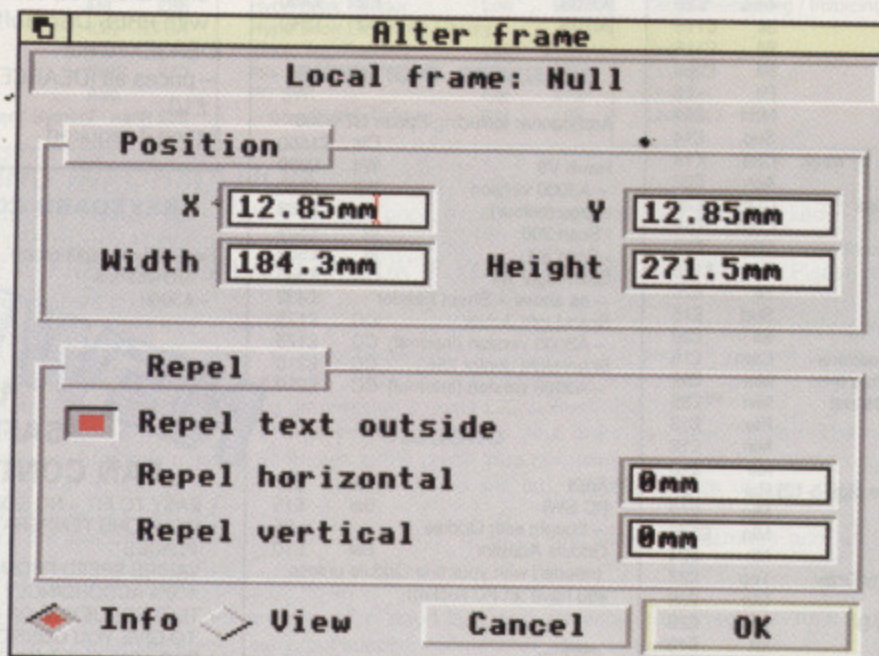


Figure 3: The Alter Frame dialog box, showing information on position and size



frame. The title bar of the window also changes from grey to yellow. This is important, because Impression can work with several documents at once, and only one at a time can be active – if you're careless you can do something unexpected to the wrong document.

You could use the frame now on the page. It's called the default frame and is put into every document automatically. We'll see later how to use or change it, but for now it will do no harm to ignore it. Instead let's make a new frame. To do that, use the Menu button to call up the main menu, slide across the Frame submenu and click on New frame.

Next, move the pointer to where you want the top left of your frame to be – crossed dotted lines help you position it accurately. Click on Select and drag the pointer in a southeasterly direction, stretching the frame until it is more or less the right size, judged either by the changing numbers or by eye.

When you let go of the Select button the frame will be placed on the page, and will be the selected frame.

You can always tell which is the selected frame because its outline is green. In addition, any frame created on a page, when selected, has a small square called a handle on each corner and each edge. A selected frame is shown in Figure II.

The handles are used to change the shape and size of the frame once it has been created. So you can't resize the default frame as it has no handles.

If you now move the pointer inside the new frame you will see it becomes a normal pointer again, meaning that it's waiting for you to do something with it. Try moving the pointer inside a handle – it changes to a star shape, indicating that you can pull the edge or edges of the frame attached to that handle. Click and hold Select, then move the mouse around and see which directions are effective. Now try a different handle.

You can move the frame bodily to another part of the same page simply by clicking and holding Select within the frame area. After a short delay the pointer will change to an open hand shape to alert you to the change of function.

If you move the mouse now, the whole frame will be dragged around until you release the button.

Another, sometimes more convenient, way of doing this is simply to place the pointer on the edge of the frame but not in a handle. This time the star shape means that you can move the whole frame – try it.

There's yet another way of positioning frames which is useful if you are copying an existing layout that you can take a ruler to. You can do this via the Frame submenu, by clicking on Alter frame, which brings up a dialogue box like that in Figure III. This contains a lot of information but for now we'll concentrate on the section on position.

The position given is that of the top left corner, measured from the top left corner of the page. Try altering the position and dimensions of the frame. When you've finished, click on the OK box to make the changes – or you can click on Cancel or the dialogue box's close icon to leave the frame unchanged. A quicker way to get to the dialogue box is to press Ctrl-F10.

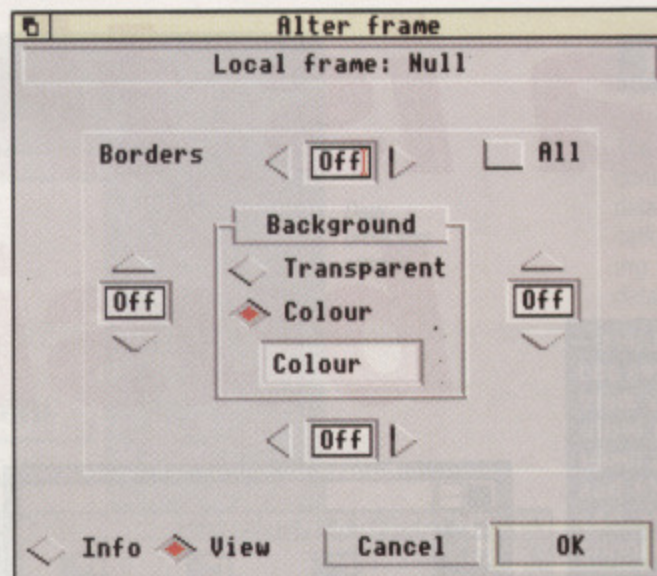


Figure IV: The Alter Frame dialogue box, showing controls for a frame's appearance

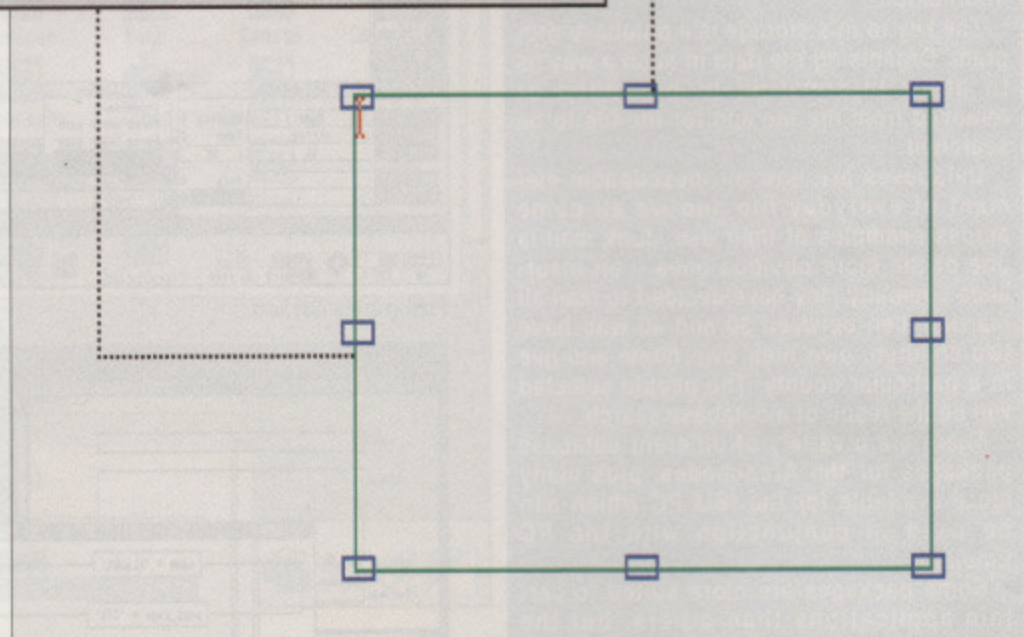


Figure V: A pair of frames, with one partly overlaying the other

## Frame effects

Although you can see frames on screen, they are invisible on the printed page unless you choose to give them a border or a colour. You can do this from the Alter frame dialogue box.

Use Control+F10 to call it up and click on the View button. Figure IV shows what you should see.

Experiment with the borders yourself and instead of clicking on OK with Select, use Adjust so the dialogue box stays on screen while you see the effects of your choices. You needn't put a border on all sides of the frame – different ones can be used on any side independently, for different effects.

The Transparent and Opaque options let you give a frame a

background colour or make it transparent. Tinted areas are useful for drawing attention to items, and transparent frames are vital for many effects, as we shall see later.

Before leaving the topic of frames for now, let's see what happens if you place one frame so it overlaps another. First make a frame about half the width of the page, then start another in the middle of it, enlarging it until it is about the same size as the first. You should end up with a pair of staggered frames like those in Figure V.

The frame created last is obscuring part of the older frame – it's on top of the other one. Such a stack can have many

frames in it and they need not all overlap. A key fact in understanding DTP is that a frame can affect the contents of any frame below it in a stack, but lower frames can't affect the ones above them.

Fortunately there is a way of altering the stack order – if you select the overlying frame and click on Put to back in the Frame submenu you will see the other frame come to the top of the stack. Now use Bring to front to restore the original order.

Finally we come to the single most important action in DTP – saving your work. Call up the Document submenu, bring up the Save document dialogue box and save in the usual Risc OS way.

**Key Tip**  
Cultivate the habit of saving your work at regular intervals – say every five or ten minutes. Impression's key shortcut Control+F3 makes this really simple. One day you'll be grateful for it.



## Data is their business

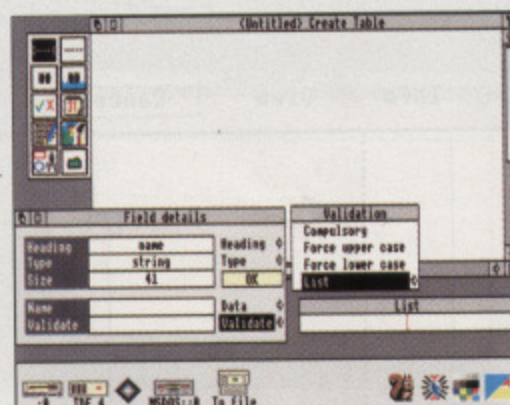
**I**n the very early days of computers – when they were made from valves and occupied whole rooms – they were seen as machines to perform arithmetical calculations many times faster than humans. With time their role has changed and now the computer has become more commonly used for storing information.

The key to this storage is a database program. Organising the data in such a way as to allow information to be added or removed from the file and for the file to be searched.

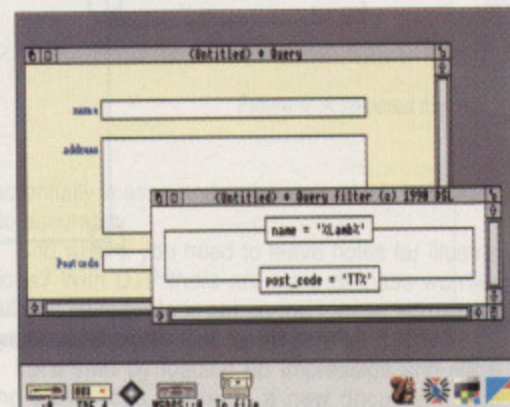
Databases are now an inescapable element of everyday life and we all come across examples of their use. Junk mail is one of the more obvious ones – an insurance company may have decided to mail all married men between 30 and 40 who have two children, own their own home and live in a particular county. The people selected will be the result of a database search.

There are a variety of different database packages for the Archimedes, plus many more available for the IBM PC which can be used in conjunction with the PC Emulator.

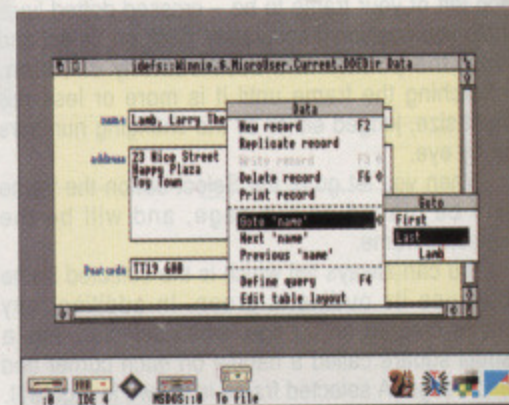
Some packages are more suited to certain applications than others, but the underlying principles are the same – they all provide a structure in which information can be stored in a file and then retrieved.



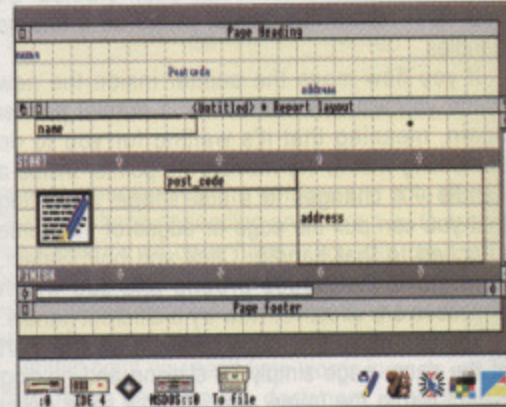
Putting in the first field



More complex search criteria



Simple searching



Report generator in action

### Records and fields

Any database whether the whole of the British Electoral Roll or a manufacturer's product range consists of data which can be linked to describe something. The individual items of data which are collected form a record known as fields.

For example, on the Electoral Roll each record describes a particular person, with the individual items of data, such as surname, forename, house number, street, voter number and date of 18th birthday. These are all fields within the record.

This concept can be a little difficult to grasp but it is essential to the understanding of how to set up and use a database. To make it easier, some packages such as Multi-Store don't talk of records at all – using the word *card* in its place.

This gives a useful analogy between a database file and a card index. If you imagine each record to be a card in, for example, an address card file with the individual lines of information being fields then you'll get some idea of the concept.

### Relational and flat-file databases

Databases fall into two major categories, relational and flat file. The former allow records in different files to be linked together. Suppose a travel agent decided to use a database to give customers details of their destination. One database might contain information about the resorts, another more general information about different countries.

With a relational database it would be possible to search for Paris to get information about the local attractions and linked data from a country file could tell you that the currency in France is the franc, that the clocks are an hour ahead and that the people speak French.

Flat-files allow you to search your information within certain parameters which you set to form a sub-set of the database. Which database you opt for depends on the applications you have in mind and the size of your bank account.

### Reports

Another important features of databases in general is how the information can be presented on paper. Generally this is done in one of two ways.

Firstly the package will almost certainly have a report generator capable of printing individual records or tables with appropriate headings. Secondly selected data can be saved into another file in a form suitable to load into a wordprocessor or a spreadsheet.

Often all that is required is that information from the database has to be placed into standard letters. This is achieved by selecting the records which satisfy criteria then copying the fields needed for the letter – probably names and addresses – into a file. This data is then merged with the letter by a wordprocessor.

● By now you'll have realised why a computerised database has so many more uses than a simple card index. Information can be extracted in a variety of ways as well as allowing data to be extracted very quickly when not all the details are known. Next time we'll look at getting the information into the machine.



## Privacy safeguards

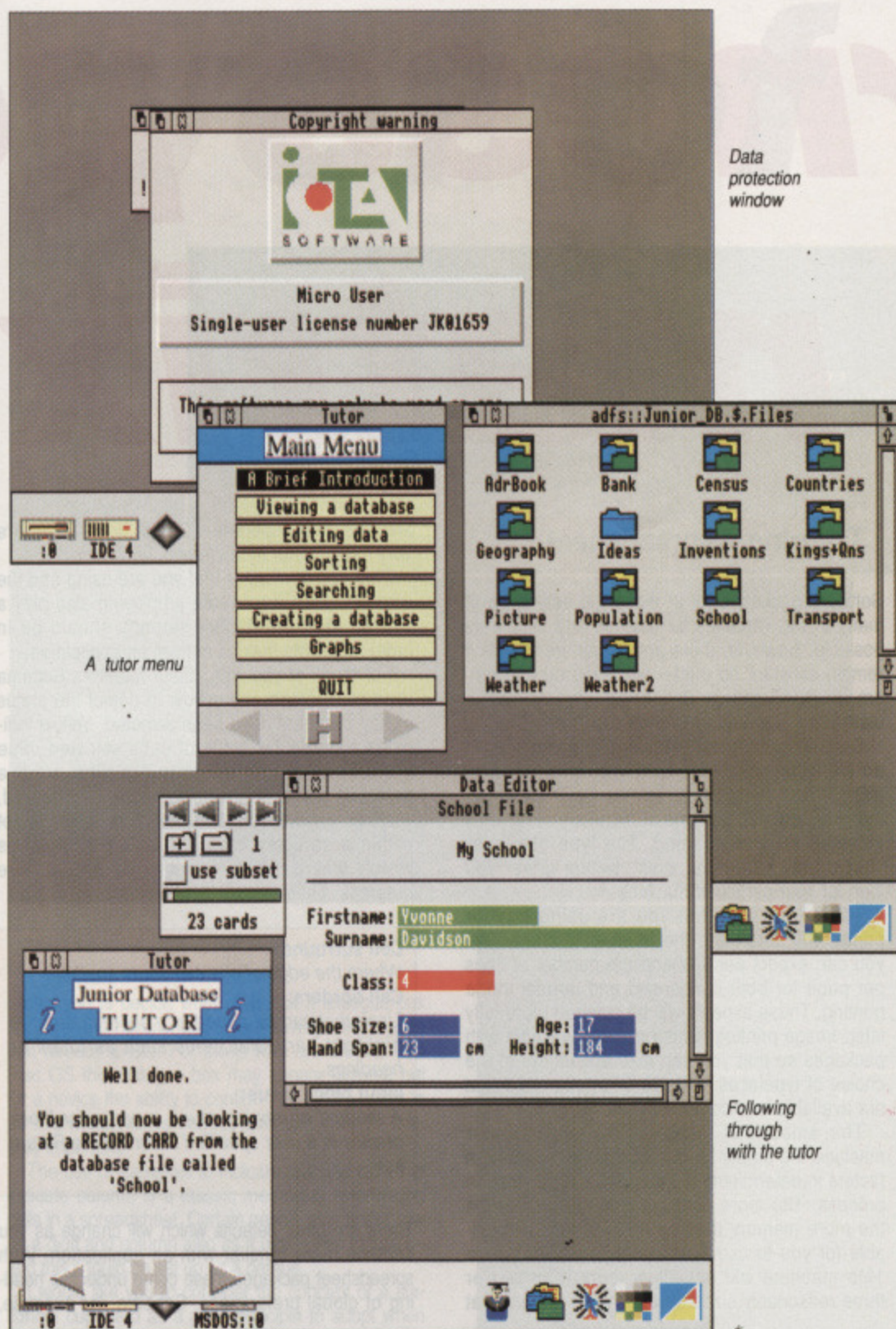
The Data Protection Act of 1984 was devised to control the computerised collection and use of data about individuals. It's very broad in its application so you have to ensure that you are working within its provisions when you create a database containing information living individuals.

In principle all computerised databases have to be registered and any individual has a right – provided you pay a fee – to apply for a copy of any information held about you on any given database. If you think the information is incorrect you can request it to be changed.

Fortunately some databases do not have to be registered:

- Those used for personal, family or household purposes or for recreation.
  - Those which contain data which is only used for calculating and paying wages, keeping accounts, records or purchase or sales to ensure that appropriate payments are made.
  - Those which are simple mailing lists and contain very limited information – usually just names and addresses. However, this only applies if none of the individuals included objects to being in the file.
  - Personal data held by unincorporated members' clubs – usually a sport or recreational club which is not a registered company. Such a database can only contain information about members and again is subject to the approval of the members.
  - Databases which by law have to be public, such as the Electoral Roll.
  - Databases which have to be exempt to safeguard national security – this can only be granted by a government minister.
- If you are unsure of the guidelines you can obtain a registration pack from a post office or contact:

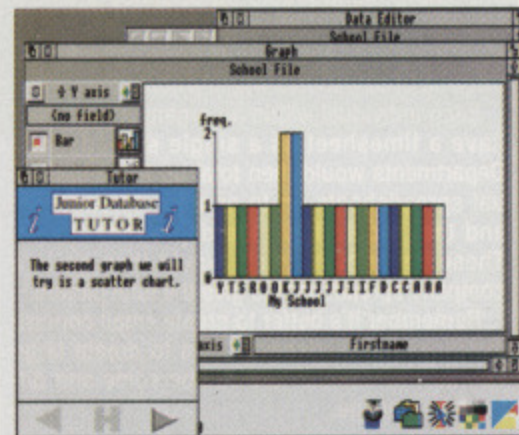
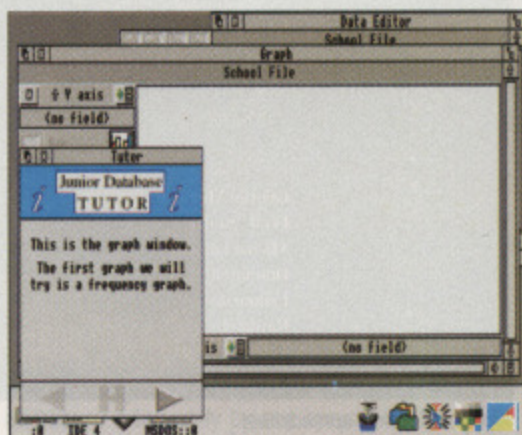
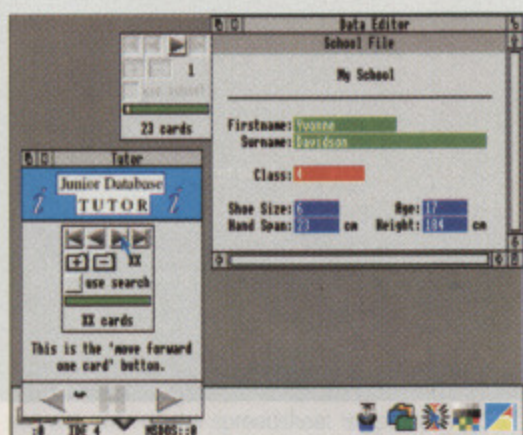
The Data Protection Registrar  
Springfield House  
Water Lane  
Wilmslow  
SK9 5AX  
Tel: 0625 535777



Data protection window

A tutor menu

Following through with the tutor





# Harness power of the spreadsheet matrix

**A** SPREADSHEET is the only computer product not to have a pen and paper equivalent. The spreadsheet is an application born of computers. In this series of articles we will be referring mostly to Clare's Schema for the sake of consistency. However, the common ground between all spreadsheet packages is this ability to create a matrix of data and then carry out mathematical functions. For those who are not familiar with spreadsheets Figure 1 is a small example of a typical spreadsheet.

The information in grey displayed above and to the left of the spreadsheet indicates the row and column references for particular cells within the matrix. A, B, C and so on, indicating the column reference with 1, 2, 3 ... indicating the row reference. In the example the cell containing "Q1" would be referenced as cell D4. The cells containing "1990-1991 Sales Figures" occupy three cells B2, C2 and D2 but because the text is centre justified its reference is C2.

Information can be appear in a spreadsheet in one of four states: Positive, negative or zero digits and text strings. Spreadsheets usually allow each of these items to be set up exactly to meet your particular needs of font, weight, height, width, foreground and background colour.

In this example you'll note that the negative values in cells E5 to E11 appear red because they were set up to display in a red foreground colour. It's also possible to call up brackets around negative numbers (£136.97) as in cells F5 to F11 if a print out is required.

Looking again at the spreadsheet you'll see that although a spreadsheet is a matrix, text strings can overflow horizontally as shown by the title "1990-1991 Sales Figures". You can often use borders around the cells to add emphasis and to clarify key points as well as removing the harshness of a matrix structure.

One feature that makes a modern spreadsheet program easier to use is the ability to create small, manageable spreadsheets which interlink with each other. An ideal way of understanding this concept would be to consider the tracking of timesheets within a company.

Each individual within an organisation would have a timesheet as a single spreadsheet. Departments would then total up these individual spreadsheets on to another spreadsheet and they would have the department name. These department totals would then go to a company spreadsheet to give the total picture.

Remember it's better to create small concise interlinked spreadsheets than to create large spreadsheets which are cumbersome and difficult to manage.

## Tailoring a spreadsheet

Software packages try to make the setting up of many of the variables as obvious and simple as possible. However, there are certain items which remain constant no matter what you do and others which will change depending upon the particular task you are undertaking.

Default, or constant items are in most cases to do with the particular hardware that you are using. The type of printer, paper size, amount of memory and also the type of monitor you have all come under this heading. The type of printer should only determine which printer driver you load for your particular machine.

The paper size that you are using in your printer will determine the number of characters you can expect per line and the number of lines per page for both condensed and normal mode printing. These aspects will be covered more fully later. Image printing is also usually available with packages so that you can take advantage of the choice of typefaces, weights and point sizes that are available for Acorn machines.

The amount of memory you have in your machine will surely be one of the most important factors in determining the amount of data you can process. The more sophisticated the application the more memory it takes and the less is available for you to use. For example, Schema on a 1Mb machine will not allow more than two or three reasonably sized spreadsheets to be run at

any one time. Pipedream 3 and SigmaSheet are very much better in this area.

The type of monitor that you are using and the screen mode that you are employing also play a part in what the default settings should be in order to get the maximum from an application.

For those of you with colour monitors Schema uses blue, green and yellow to depict the status of any cells that have been selected. Yellow indicates a particular block of cells selected, blue indicates a selected cell when it is either within a selected block or when no block is selected, while green indicates a selected cell which is not within a selected block. These are all terms which will become familiar to you as we progress. There are also various shades of grey.

### Cell surrounds:

Where the edge of one cell abuts another.

### Cell borders:

Lines that can be added to a sheet in order to highlight particular items such as totals or headings.

### Input block focus:

A method of moving round a particular block of cells in a user specified order via the Return key

There are other defaults which will change as you become more familiar with an application. With spreadsheet packages these come under the heading of global preferences. Schema, for example,

	A	B	C	D	E	F	G	H	I
1									
2		1990-1991 Sales Figures							
3									
4				Q1	Q2	Q3	Q4	Total by name	
5		George Michael	£1.30	£98.25	(£132.63)	£1,020.95		£791.37	
6		Fred Astaire	£4.21	£92.32	(£129.72)	£1,024.88		£805.05	
7		Michaelangelo	£7.12	£90.39	(£126.81)	£1,028.81		£818.73	
8		Donnatello	£10.03	£86.46	(£123.90)	£1,032.73		£832.40	
9		Leonardo	£12.94	£82.53	(£120.99)	£1,036.66		£846.08	
10		Raphael	£15.85	£78.60	(£118.08)	£1,040.59		£859.76	
11		Total by Quarter	£51.45	£530.54	(£752.13)	£6,184.62			
12									

Figure 1: A typical spreadsheet



# Power of the

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
George Michael	£0.00	£0.00	£ 0.00	£0.00	£0.00
Fred Astaire	£0.00	£0.00	£ 0.00	£0.00	£0.00
Michaelangelo	£0.00	£0.00	£ 0.00	£0.00	£0.00
Donnatello	£0.00	£0.00	£ 0.00	£0.00	£0.00
Leonardo	£0.00	£0.00	£ 0.00	£0.00	£0.00
Raphael	£0.00	£0.00	£ 0.00	£0.00	£0.00
Total by Quarter	£0.00	£0.00	£ 0.00	£0.00	

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
George Michael	£1.30	£98.25	(£132.63)	£1,020.95	£791.37
Fred Astaire	£4.21	£94.32	(£129.72)	£1,024.88	£805.65
Michaelangelo	£7.12	£90.39	(£126.81)	£1,028.81	£818.73
Donnatello	£10.03	£86.46	(£123.90)	£1,032.73	£832.40
Leonardo	£12.94	£82.53	(£120.99)	£1,036.66	£846.08
Raphael	£15.85	£78.60	(£118.08)	£1,040.59	£859.76
Total by Quarter	£51.45	£50.54	(£752.13)	£6,184.62	

Cell surrounds

Input Block focus

Cell Borders

North Of England

	Q3	Q4	Total by name
0.70	£0.00	£1,242.10	£1,250.13
1.68	£0.00	£1,242.10	£1,250.99
8.61	£0.00	£1,242.10	£1,263.83
2.54	£0.00	£1,242.10	£1,270.67
6.47	£0.00	£1,242.10	£1,277.51
	£0.00	£1,242.10	£1,284.35

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
Julia Rothman	£1.30	£101.75	£264.56	£2,321.54	£2,689.16
Dick O'Connell	£3.21	£105.68	£273.78	£2,411.17	£2,793.84
Luke Collins	£7.12	£109.61	£284.99	£2,500.80	£2,902.52
John Barron	£10.03	£113.54	£295.21	£2,590.43	£3,009.21
Peter Hilroy	£12.94	£117.47	£305.42	£2,680.06	£3,115.89
Richard Blunnie	£15.85	£121.40	£315.63	£2,769.68	£3,222.56
Total by Quarter	£51.45	£609.36	£1,740.59	£15,272.67	

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
John Smith	£1.30	£21.06	£41.91	£1,726.58	£2,390.85
Fred Jones	£3.40	£45.38	£100.20	£376.79	£565.77
Duncan Hunt	£10.50	£170.10	£339.50	£876.97	£1,396.07
Graham Barnett	£15.10	£244.62	£486.79	£777.17	£1,523.68
David Tomes	£19.70	£319.14	£635.04	£977.37	£1,951.25
Raymond Floyd	£24.30	£393.66	£783.38	£1,177.57	£2,378.91
Total by Quarter	£76.80	£1,244.16	£2,475.88	£8,067.34	

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
Linda Corstian	2.39	£522.68	£335.58	£1,788.03	£2,548.68
Paul Smart	£5.30	£715.50	£865.93	£2,503.00	£4,199.73
Jan Adams	£8.21	£1,109.35	£1,496.27	£3,219.97	£5,833.80
Sally Davies	£11.12	£1,501.20	£2,026.62	£3,935.91	£7,474.86
Adam Metcalf	£14.03	£1,893.05	£2,356.97	£4,651.91	£9,416.96
Tim Worley	£16.94	£2,286.90	£3,087.32	£5,467.88	£10,759.04
Total by Quarter	£57.99	£7,828.65	£10,508.68	£21,467.71	

1990-1991 Sales Figures

	Q1	Q2	Q3	Q4	Total by name
North	£51.45	£63.46	£36.00	£7,452.60	£7,603.51
South	£76.80	£1,244.16	£2,475.88	£4,062.44	£7,859.27
East	£57.99	£7,828.65	£10,508.68	£21,467.71	£39,923.03
West	£51.45	£669.46	£1,740.59	£15,275.67	£17,735.17
Total by Quarter	£237.69	£9,805.73	£14,821.15	£48,256.42	

allows you to decide whether or not a dialogue box appears when overwriting a file – saving a file to a file that already exists. For those who are familiar with Risc OS this dialogue box may appear irksome but for a novice the ability to confirm that the file about to be overwritten is the correct operation, may be critically important.

The use of numerals to indicate row and letters to indicate column is a classic method of referencing cells in a spreadsheet. Certain people may prefer row as a digit and column also as a digit – see Figure 1 – and this should be set up as a default.

I would like you to consider the concept of a stationery cupboard as a good principle to adopt when creating new spreadsheets. When designing your spreadsheet you define width of columns and height of rows, the right number of rows and columns, the font, weight, size, style and also the correct picture or cell display. Experimenting with these parameters will allow you to create a spreadsheet that meets your needs aesthetically and practically.

Looking at the final illustration you'll see an example of a sheet being utilised five times for creating a workspace depicting the Sales Figures for the various sales people of an imaginary company in the South, North, East and West of England plus a Totals sheet indicating the total sales for this company in England during the period 1990-1991.

As the sales figures for each individual sales person are entered the spreadsheet is updated and all

the consolidation is automatically carried out via the links between them. Enter the data in one position and the related totals on all sheets are automatically updated.

The printed output is one of the items to be considered when defining a spreadsheet's physical size. It is also, in my experience, an area that has not been addressed adequately by any spreadsheet package

other than perhaps Excel on the IBM PC and Apple Macintosh.

The amount of information that can be got on to a page is very much a matter of trial and error especially when varying the font sizes, as well as the cell widths and heights. Pipedream 3 does go some way to dealing with this when using the system font as it displays markers for page breaks.



# Objective route to graphics

**U**NLIKE painting packages for the Archimedes, CAD packages use picture information in a different way. !Draw to be found on Applications Disc 1 is not a fully functional Computer Aided Design (CAD) package. But it does have tremendous possibilities for CAD work as well as excellent facilities for working with text and pixel-based graphics so it is a good starting point for this series of articles.

Where painting packages store the colour of each pixel, CAD programs store information about objects. If you have a box on screen the computer stores information relating to the position of the two diagonal corners and the thickness and colour of the line.

This has two advantages, it takes up much less space than a similar image created in a paint package and more importantly the objects can be resized, edited and enlarged without any loss of definition.

For instance, if you enlarge a circle with a paint program the edges become chunkier and lose detail. However, with CAD the line is exactly the same quality and thickness as the original. All objects produced using !Draw can be edited at any time rather than having to be wiped out and redrawn whenever a change is required.

Another aspect of CAD is that the packages are often designed to work with plotters using a pen or pens to draw an image, rather than the print head of the dot matrix or ink jet printer which outputs dot by dot.

Plotters produce very high quality results with perfectly smooth curves using a variety of pens. However, you can produce very good results using the printer driver supplied on your applications discs.

First of all we're going to go through the construction of a drawing to illustrate some of the main principles. Not only will this introduce you to the facilities of !Draw, but it'll also supply us with some ready-made artwork.

This will come in handy in later articles when you'll be producing letterheads and business cards using artwork and text in combination for some snappy graphic design work.

Now load up !Draw in the usual manner. You should have an <untitled> window in the centre of the screen with a frame round three sides and a menu down the left-hand side.

Enlarge the drawing window to the full screen size and then move the window up to reveal the icon bar – this makes saving your work easier, as you can see the disc drive.

## Setting the limits

The first thing to do when starting a new drawing is to set the paper limits. Click Menu inside the drawing window and by selecting Misc you'll eventually find the paper limits menu. The options Portrait and A4 allow you to work on a vertical drawing – choose the A4 option.

If you load the printer driver for your machine – probably !PrinterDM or !Printerlx – you'll see a grey border at the top and right of the drawing window. Loading takes two stages, and it appears as an icon on the icon bar.

You can copy the printer driver on to a separate disc rather than make changes to the Applications Disc.

You'll be saving your drawings at regular intervals, so to practise choose *save as* from the menu and in place of the default name type, A4 PORTA3000 – an A4 portrait of the Archimedes – and drag the icon to your disc Filer window.

To start the drawing create two rectangles to represent the computer and monitor. You can do this via the menu button or by clicking on the toolbox directly.

It's a good idea to switch on the gridlock at this stage – found by selecting grid from the draw menu. *Show* will let you what the layout looks like.

We'll be using one tenth of an inch spacing with the first three rectangles. The point about the grid is that it is easier to line up objects as they snap to the nearest grid intersection saving your fine adjustment. Once you're happy with the grid setting *Show* can be turned off.

Clicking Select somewhere in the top left of the

drawing window and moving the pointer down and across will give you a rectangle of the same proportion of the monitor in grey.

Press the Select button when you're happy with the rough shape and size. The rectangular icon will then turn black and be fixed.

If you press Adjust instead of Select at this point with !Draw will change to path Edit mode giving you a grey outline as well but with a light blue edit control point at each corner – this will be dealt with later.

It doesn't matter if the picture isn't right at this stage as shapes can be moved, resized, and edited to get the final result. If you look at the last illustration you may notice some rectangles can be seen through others, while some blank out the one underneath.

Select the rectangle in your drawing and it will change to a dotted outline with a red square at the top and bottom of the right hand edge.

Drag the right ear with the select button and it will rotate. Move on to the bottom ear and you'll be able to resize it. Choosing style gives access to the Fill option. If you select white from the colour menu the rectangle will become white and obscure everything underneath, while None is the default.

Try to construct the drawing of your computer in as much detail as possible using lines and rectangles. If you can't get the detail you require with the grid setting try selecting a finer setting on a new drawing.

If the rectangles and lines are the wrong shape select Enter while inside the shape or line to get back to the Path Edit mode.

You can now use Adjust to move the light blue edit point to a new position. The Editing point will

Draw	Misc	
Misc	Info	
Save	New view	Paper limits
Style	Paper limits	Show
✓ Enter	Print	✓ Portrait
Select		Landscape
Zoom		A0
Grid		A1
✓ Toolbox		A2
		A3
		✓ A4
		A5

Finding your limits

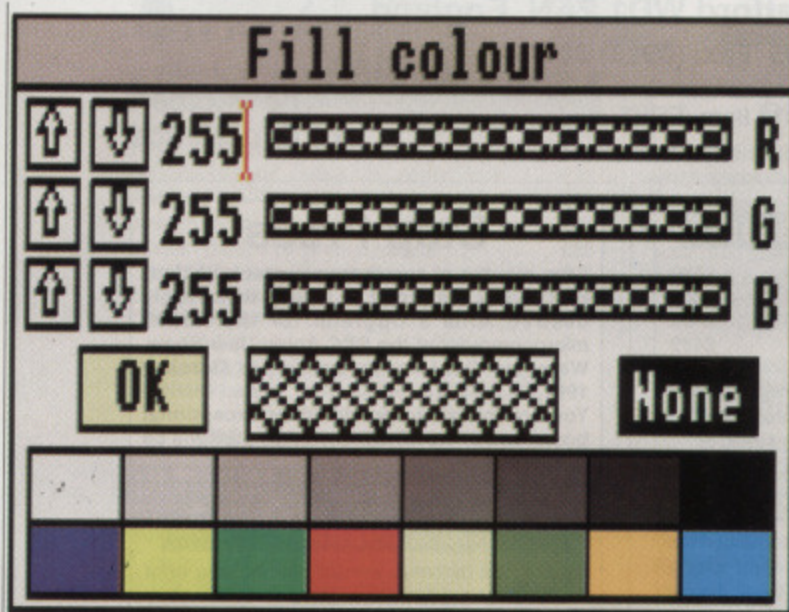
Draw	Enter
Misc	Text
Save	✓ Line
Style	Curve
✓ Enter	Move
Select	Complete
Zoom	✓ Auto-close
Grid	Abandon
✓ Toolbox	Rectangle
	Ellipse

Choosing line drawing from a menu

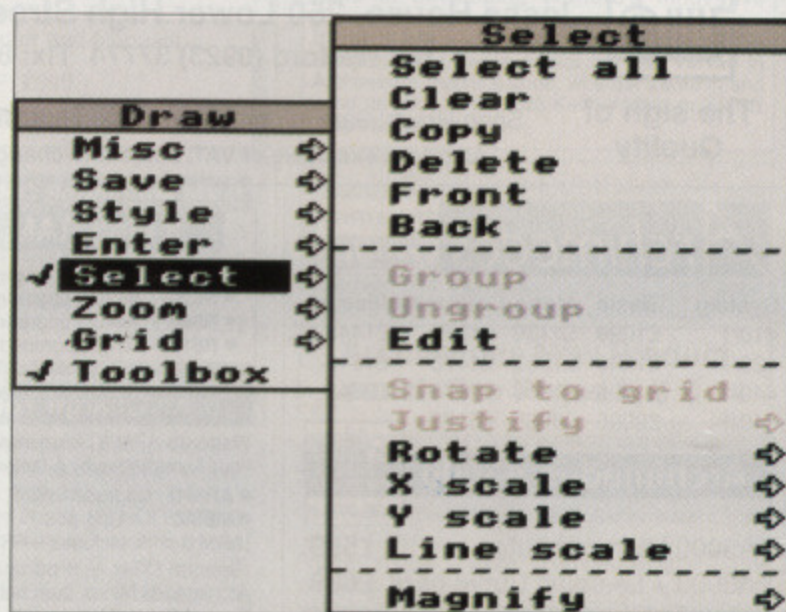


# Lay down your pen and pick up your mouse! Let Steve Bruntlett show you how to join the fascinating world of CAD

THE  
Essential  
Archimedes



The Colour Picker



The Edit selection menu

turn red when you click Adjust so that you know which edit point is active. The new shape will turn black when you press the Select button again, fixing the object in place. If you are trying to edit one object inside another just keep clicking Adjust until the object you want is shown with the four blue edit points.

Moving a rectangle or line – or any other object – is done by choosing Select from the Draw menu and pressing Select inside the shape to obtain a dotted outline.

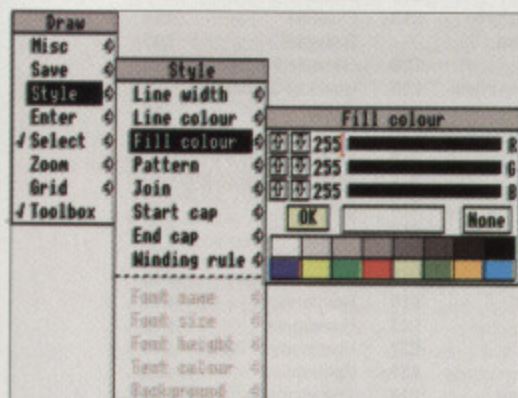
If you now press Select and keep it pressed the corners will turn cream and allow you to drag the shape around. Letting go fixes it in place.

If you're trying to move one object from inside another keep clicking Select until only the one you want has a dotted outline or you may move multiple parts of the drawing instead.

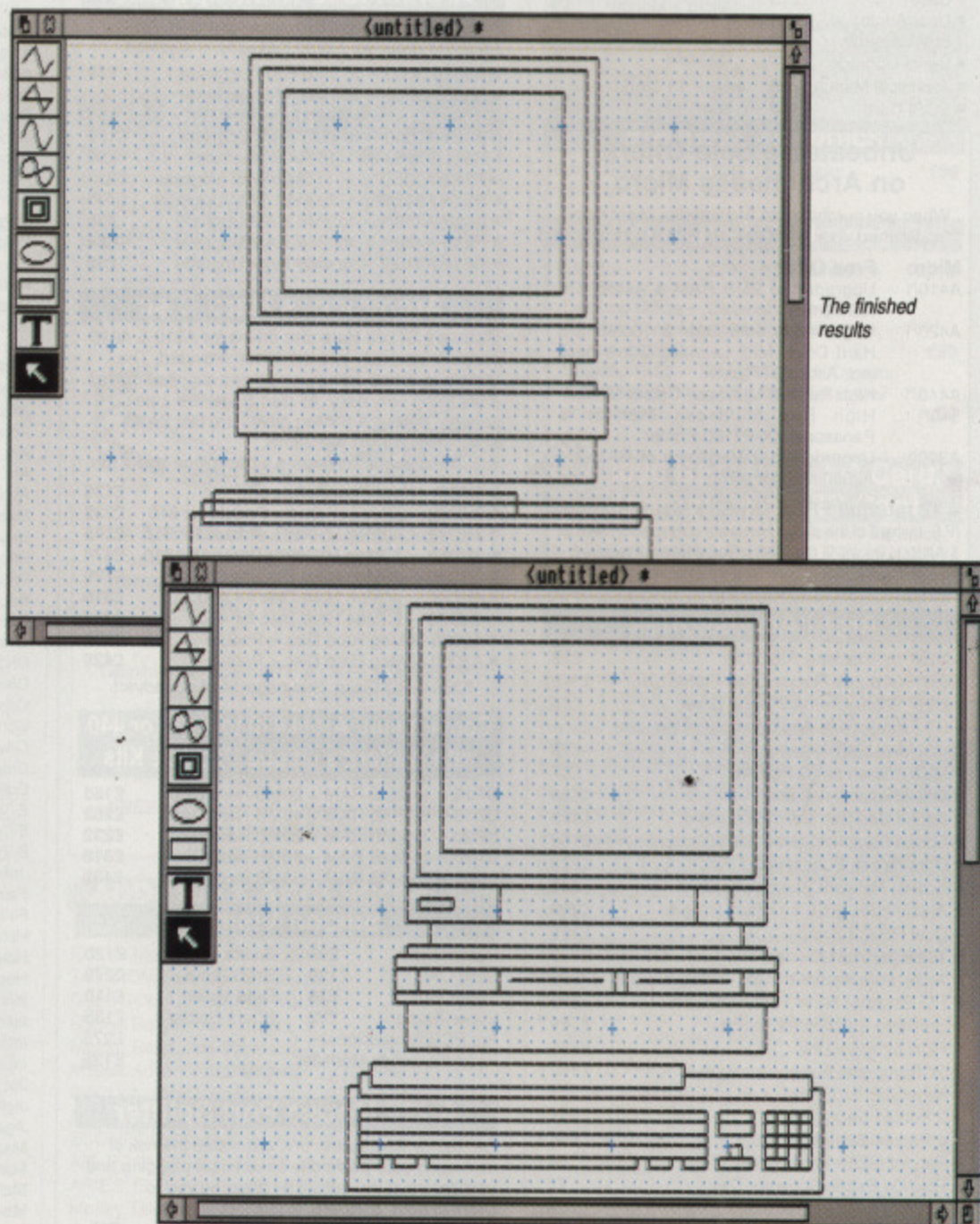
Deleting is carried out on the Draw menu, but again check that only the one you want is highlighted.

Do remember to save your work on a regular basis and if you're really adventurous you could experiment with line thicknesses and endings, or figure out how to put a picture on the monitor you've just drawn.

● **NEXT MONTH:** Continuing with !Draw we'll add detail and design a business card



Altering the fill colour



The finished results



# Watford Electronics

(A member of the Jessa group of Companies - Established 1972)



Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 37774 Tlx: 8956095 Fax: (0923) 33642

The sign of  
Quality

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.  
All prices exclusive of VAT; subject to change without notice & available on request.



The choice  
of Experience

## Archimedes micro

System	Basic	Mono Colour	Multiscan
410/1	£1099	£1159	£1278
420/1	£1299	£1359	£1478
440/1	£1699	£1759	£1878
540/1	£2995	£3065	£3178

### Archimedes A3000

12 MONTHS  
FREE  
MAINTENANCE  
ON SITE

- A3000 Microcomputer **£599**
- A3000 + Learning Curve pack **£699**
- 3.5" External Drive **£99**
- Monitor Stand **£16**
- External Podule Case **£13**
- User/Analogue Port Upgrade **£42**
- Serial Upgrade **£17**
- Technical Manual **£60**
- SCSI Card **£149**
- Dust Cover Micro only **£5**
- Dust Cover for Micro + Monitor **£9**
- User port/MIDI upgrade **£45**
- UHF TV Modulator **£30**

### Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro	Free Offer
A410/1	Upgraded to 2MB RAM & 44MB IDE Hard Drive
A420/1	Upgraded to 4MB RAM & 100MB IDE Hard Drive, MkII Learning Curve pack incl. Acorn DTP pack
A440/1	High Res 14" Multiscan Colour Monitor
540/1	High Res Multiscan Monitor & Panasonic KX-P1180 Printer
A3000	Upgraded to 2 Megabyte of RAM & a A3000 Monitor plinth.

+ 12 months FREE On-Site Maintenance  
(P.S. Instead of the above Hardware upgrades on A410/1 & A420/1, we will fit the 30MHz Turbo Board if required. Please specify your requirement when ordering.)

### Archi Accessories

- NEW Multitasking RISC OS **£29**
- 3.5" 800K 2nd Floppy Drive (305/310) **£118**
- 5.25" 800K external Floppy Drive **£85**
- I/O Podule (with Analogue port, User port, & 1MHz bus) **£76**
- MIDI add-on to I/O Podule **£27**
- MIDI Expansion Card **£65**
- Sound Sampler Mono (Armadillo) **£129**
- Sound Sampler Stereo /Midi (Armadillo) **£186**
- Chromalock Podule (Wild Vision) **£275**
- Econet Network Board **£44**
- Archimedes IEEE Interface Adaptor **£269**
- Dual RS232 Podule **£195**
- 16 bit parallel I/O Card **£195**
- Archi replacement mouse - New design **£32**
- PC Emulator NEW Faster Version **£85**
- Software Developers Toolbox **£149**
- Floating Point Unit **£455**
- SCSI Adaptor Expansion Card **£162**
- Keyboard Extension Lead **£6**
- 2 Podule Backplane **£25**
- 4 Podule Backplane **£38**
- Fan for above backplanes **£8**
- Risc Os Extras Software Disc **£5**
- Smoked Perspex Low profile Keyboard Cover **£8**
- Ethernet Card **£220**

### 8 Meg RAM Upgrades

- R810 - A410/1 upgraded to 8MB **£599**
- R820 - A420/1 upgraded to 8MB **£569**
- R840 - A440/1 upgraded to 8MB **£499**
- R814 - R140 upgraded to 8MB **£499**

### Turbo Charge Your Archimedes

Watford's ARM 3 board increases the speed of your Archimedes by a factor of 3 to 6.

- ARM-3 Upgrade Board **£299**
  - MEMC 1A Upgrade **£42**
- (ARM 3 price includes a FREE Chip extraction tool)  
(Special Offer - If purchased together with an Archimedes Micro, then not only will we fit the card Free of Charge but we will also reduce the price by £25 i.e. You pay only **£274** for ARM3 Board)

### Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

- R302-A3000 - to 2MB RAM Upgrade **£39**
- R303-A3000 - to 2MB RAM Upgrade (expandable to 4MB) **£69**
- R304-A3000 - to 4MB RAM Upgrade **£159**
- R311-A305 - to 1MB RAM Upgrade **£50**
- R312-A305/310 - to 2MB RAM Upgrade **£215**
- R314-A305/310 - to 4MB RAM Upgrade **£405**
- R412-A410/1 - to 2MB RAM Upgrade **£35**
- R413-A420/1 - to 4MB RAM Upgrade **£64**
- R414-A410/1 - to 4MB RAM Upgrade **£98**

### Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided. The 'simple to follow' fitting instructions supplied makes drive fitting very easy. All disc drives are auto parking. 40Meg & 53Meg drives are fast 24mS type, while 20MHz are 28mS.  
P.S. A310 upgrades require a backplane and a fan.

- 3HDP - Hard Disc Podule only **£135**
- 3HD20 - 20Meg H' Disc + Podule for 310 **£235**
- 3HD40 - 40Meg H' Disc + Podule for 310 **£345**
- 3HD50 - 53Meg H' Disc + Podule for 310 **£474**
- 4HD20 - 20Meg Hard Disc for 410 **£129**
- 4HD40 - 40Meg Hard Disc for 410 **£215**
- 4HD50 - 53Meg Hard Disc for 410 **£335**
- A3000 20Meg Hard Disc + Podule **£299**
- A3000 40Meg Hard Disc + Podule **£429**

IDE HARD Disks: See page 14 of our advert.

### Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

- UP10 - to 2MB RAM + 20MB Hard Disc **£165**
- UP15 - to 2MB RAM + 40MB Hard Disc **£252**
- UP20 - to 4MB RAM + 20MB Hard Disc **£232**
- UP30 - to 4MB RAM + 40MB Hard Disc **£318**
- UP40 - to 4MB RAM + 53MB Hard Disc **£438**

### Silicon Vision

- Gerber Plot **£95**
- Solid CAD **£120**
- Super Plot **£28**
- Super Dump **£22**
- Arc PCB Professional **£275**
- Realtime Solids Modeller **£136**
- Solids Render **£120**
- Solid Tools **£279**
- Data Vision **£110**
- Share Holder **£135**

### Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. **£15**

### Stop Press

After months of secret development, Watford Electronics are proud to launch their highly desired ARM 3 Upgrade for the A3000 microcomputer at the BBC Acorn User Show, Wembley Conference Centre, in October 1991.

You are invited to preview this exceptional board on our stand. Our technical staff will be in attendance.

### 0% Finance

By popular demand, we are now able to offer 0% Finance on A3000 Learning Curve Pack.

### Graphics, Art, Design & Games

GRAPHICS		Olympics	
Atelier	£65	Pipe Mania	£17
Artisan II	£45	Pirate	£16
Artisan Gallery	£16	Power Band	£18
Autosketch II	£65	Puncman 1 & 2	£16
Craftshop 1 & 2	£28	Puncman 3 & 4	£16
Euclid 2	£50	Pysanki	£15
Graph Box	£59	Real McCoy	£22
HotLink Presenter	£40	Real McCoy 2	£23
Kermit	£46	Redshift	£14
Mogul	£17	Return to Doom	£16
Poster	£79	Revelation	£54
Pro Artisan	£70	Repton 3	£15
Render Bender	£58	Rotor	£19
Snippet	£21	Splice	£25
Tween	£21	Sporting Triangles	£24
GAMES		Miscellaneous	
ArcPinball	£18	Star Trader	£14
Apocalypse	£15	Superior Golf	£15
Arcade 3 Compil.	£12	Super Pool	£19
Arcade Soccer	£15	Talisman	£12
Arc Pinball	£18	The Pawn	£19
Arc Trivia	£18	Thundermonk	£11
Avon	£16	Timewatch	£24
Ballerina	£14	Trivial Pursuit	£22
Blowpipe	£16	Twin World	£15
Boogie Buggy	£19	U.I.M.	£23
Break 147	£19	White Magic	£15
Bug Hunter	£14	White Magic 2	£15
Caverns	£14	Wimp Game	£15
Chess 3D	£14	Worldscape	£16
Chocks Away	£14		
Conqueror	£18	Ancestry	£59
Cops	£14	Arccomm 2	£38
Corruption	£18	Arcterm 7	£64
Crisis	£21	Armades Sound	£60
Drop Ship	£12	BBC DFS Reader	£6
Enthar Seven	£21	Broadcaster Loader	£65
E-Type	£13	Equasor	£40
E-Type Designer	£13	FlexiFile	£98
E-Type Extra 100 miles	£13	Genesis	£65
Family Favourites	£15	Genesis 2	£113
Fireball 2	£19	Hearsay Comms	£50
Holed Out Designer	£13	Pack	£22
Holed Out Golf	£13	Investigator 2	£22
Hostages	£15	JX Archi Colour Printer	
Ibix the Viking	£14	Driver for Citizen &	
Inertia	£13	Star	£15
Inter Dictor 2	£26	Numerator	£66
Iron Lord	£15	Presenter 2	£35
Jet Fighter	£10	Presenter Story	£145
Jiglet	£25	Rainforest	£17
Jigsaw	£27	Revelation	£58
Maggie	£39	Rhapsody in Blue 2	£45
Man at Arms	£16	Speech!	£15
MahJong Patience	£15	The Victorian	£17
Manchester United	£19	Toolkit (Clares)	£35
Nevryon	£14	Touchtype	£40
		Tracer	£46



## LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77	£77 each
Assembler; LISP; Prolog X	£149 each
ANSI C Rel. 3	£125
BASIC Compiler	£77
Cambridge Pascal	£60
Logotron Logo	£45
Macro Assembler	£40
Risc Basic	£120
Robo Logo	£69
Risc FORTH	£110

## Minerva's Archimedes Software

Home Accounts*	£36	Sales Ledger*	£53
Stock Manager*	£53	Purchase	
Nominal Ledger*	£53	Ledger*	£53
Ancestry	£59	Reporter	£29
System Delta+	£55	Mailshot*	£29
System Delta + Reference Manual			£25
Order Processing/Invoicing*			£53
School Administrator			£118

\* Requires System Delta

NEW Business Accounts Packages

Nominal Ledger, Order Processing/Invoicing,  
Purchase Ledger, Sales Ledger & Stock Control

Price: £78 per Module or

£299 for the complete Software Suite

## ULTIMUM - Archimedes A3000 Podule Racking System



### THE ONLY LOGICAL WAY TO EXPAND YOUR A3000 COMPUTER

The accepted standard for Archimedes computer expansion is the Acorn Podule, designed initially to fit the old 310, and also for the later A400 and A400/1 series micros. The podules fit inside these computers up to four at a time. The A3000 is the little brother of the family, but can only have one podule at a time, plugging into the back of the computer.

Other attempts have been made to expand the A3000 by trying to introduce a 'mini-podule'. This is impractical for many reasons, amongst which is the reluctance of manufacturers to produce them. Nobody wants to re-design podules already produced. Some cannot be produced on a 'mini-podule' as they are far too complicated and simply wouldn't fit.

Watford Electronics listens to the demands and requirements of its customers, and we are glad to say that we have come up with the only real solution to the A3000 expansion problem. The ULTIMUM Podule Racking System allows up to three FULL SIZE standard Archimedes 300/400 series podules to be fitted to the computer. In addition, there is also provision for a hard disc drive and a podule to be fitted internally.

Since the ULTIMUM Podule Racking System takes proper full size podules, you will be able to use any of the currently available peripheral equipment, from companies like Computer Concepts, Armadillo, Acorn and of course, our own brand. Fitting the podules to 'ULTIMUM' is simple. They are neatly fitted inside the metal case of the rack, avoiding the previously untidy method of hanging the podule off the back of the computer, risking damage to both, it and to the computer.

'ULTIMUM' has its own power supply, so no strain is put on the A3000 power supply. There is also an IEC mains output socket for an Acorn type monitor so reducing the number of plugs required to go to the mains. The ULTIMUM is rigidly clamped over the top and under the computer, and allows direct access to the floppy disc drive and reset button, rather than obstructing access as on other systems. The mounting method employed is so firm that the computer could even be safely transported without the assembly falling apart.

Price: £125

## Archimedes A300/A400 SCSI Hard Disc Offer (while stocks last)

100MB Hard Disc Upgrade complete with Controller card, Cables, Formatter and Manuals

RRP: £999

Offer Price: £399

## Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers. New RISC OS Version

Only £15

## Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Up to 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

• A300/A3000 £21 • A400 £25

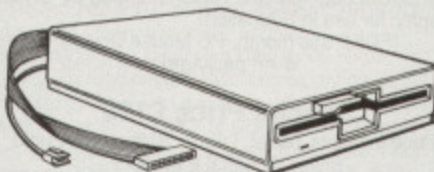
## Special Education Prices

All education establishments qualify for special education prices on micros, etc. Please write in or telephone (0923) 37774 or 50335 for written quotation.

## BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) £399

## FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during September

## ADD-ONS & ACCESSORIES

Turbo 65C102 Add-on Module	£115
Econet Module for the Master	£45
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99
Ecolink	£270

## Staff Vacancy

Due to recent changes in our pioneering R & D Department, we now have exciting new vacancies for an Archimedes Hardware designer and a machine code software engineer to join our team in developing Watford's innovative Archimedes products.

If you have an in-depth knowledge of the computer's hardware and/or are well versed in Archimedes machine code, why not write in and send us your CV, or call Keith Archer or Shiraz Jessa for an interview.

## Desk Top Publisher

Acorn's Archi DTP Package	£108
Impression 2 DTP Pack	£130
Impression Junior	£72
Tempest DTP Package	£90

## Archimedes New Product Launch See Pages 2, 5 & 14

## Archi Wordprocessors

Pendown Archi	£48	Archie Spell Master	£25
Wordwise + Disc	£24	PD Spellchecker	£40
Image Writer	£25	View	£45
Interword Disc	£24	Graphic Writer	£19
1st Word Plus - 2	£63	EasyWord	£30

## Databases

AlphaBase	£36	Multistore	£195
Knowledge Organiser	£42		

## Spreadsheets

Intersheet Disc	£24	Viewsheets	£45
Sigmasheet	£39	Schema	£89

## Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

## Integrated Packages

- Logistix £79 • Pipedream 3 £119
- Desktop Office - Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio - Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment. £85

## NEW A3000 BBC User, I/O Card, Analogue Port IIC Card

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

### Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. £42

Continued → → → → → → → →



## Archi A4 Scanner



This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the IHELP application on the Acorn applications discs. The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

### New Low Prices:

Archi A4 Scanner	£349
Sheet Feeder for above	£95
Scanner + Sheet Feeder	£419

(Dealers Inquiry welcome)

## Z88 Portable Micro



£185

### FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

### Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack	£18.00
• 128K RAM Pack or 128K EPROM Pack	£42
• 512K RAM Pack	£175
• Z88 Eprom Eraser Unit	£33
• Z88 Spellmaster for Pipedream	£40
• Z88 Carrying Case	£8
• Z88 Computing Book	£9.95
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£28
• Z88 Parallel Printer Cable	£25
• Z88 to Archi Link	£15
• Z88 to BBC Link	£20
• Z88 to PC Link II	£30
• Z88 to Macintosh	£52
• Z88 Mains Adaptor	£9
• Z BASE	£56
• Z TAPE	£42
• Z TERM	£42
• Z88 Modem	£149

## Archi Real-Time Digitiser



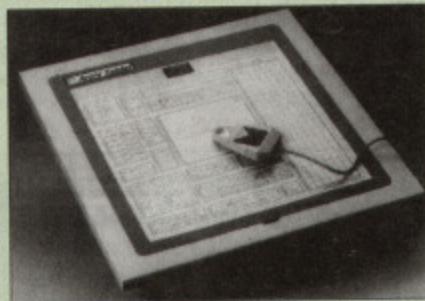
### Now supplied with NEW RISC OS Version Software

Watford's Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

### Price £175

A Set of Colour Filters for colour image grabbing using a video camera	£16
New Risc-OS Software Upgrade	£39

## Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

### Special Price £199

(Price includes Tablet, Leads, Software & Puck)  
Stylus Optional Extra £15

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £125

## Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: £2



## Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

## Watford's MkII 1772

### Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

#### Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only £39.00.

- SPECIAL PRICE £44.00
- DDFS Manual (No VAT) £6.95
- We will exchange your existing DFS Kit for our sophisticated DDFS for only £30.00

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.



## 3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor

• 10 x 5.25" S/S D/D 40T (744)	£5
• 10 x 5.25" D/S D/D 40T (745)	£5
• 10 x 5.25" S/S D/D 80 Track (746)	£7
• 10 x 5.25" D/S D/D 80 Track (747)	£7
• 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT	£9
• 10 x 3.5" S/S D/D 40/80 Track	£7
• 10 x 3.5" D/S D/D 40/80 Track	£7
• 10 x 3.5" Double Sided High Density	£13



## Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

• 10 x M3 3.5" D/S D/D 80 Track	£7
• 10 x M9 3.5" D/S High Density	£12
• 10 x M4 5.25" S/S D/D 40 Track	£5
• 10 x M5 5.25" D/S D/D 40 Track	£5
• 10 x M7 5.25" D/S D/D 80 Track	£7
• 10 x M8 5.25" D/S H/D Hi-Density	£9
• M2 3" Double Sided	£2.50 each



**CREDIT CARD 24 HOUR**  
**Ansaphone Hot Lines**  
**(0923) 50234 or 33383**



## Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

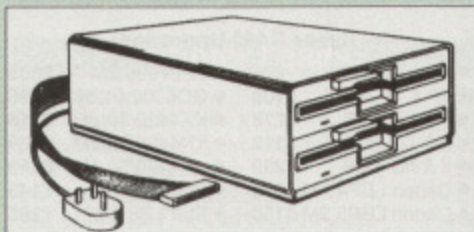
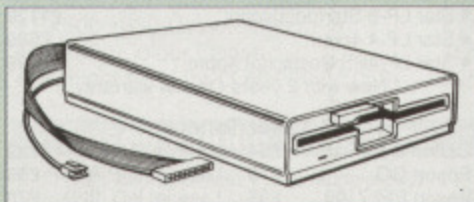
If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.**

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

**"Test Bureau Approved for Use in Education"**



**Our Disc Drives conform to BS415**

Type	Description	
<b>Disc Drive without PSU</b>		
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£72
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£142
<b>Disc Drive with PSU</b>		
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£82
• CD800S:	Twin, 40/80 track, 800K Double sided Drives	£155

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

## Disc Drive/DDFS Offer



- The popular CLS400S 40/80 track switchable disc drive.
  - Watford's popular Mk II DDFS Interface (allows up to 720K storage). Will run both in single & double density modes.
  - A comprehensive DFS Operating manual
- Bargain at Only £116** (Offer valid until stocks last)

## 3.5" DISC DRIVE

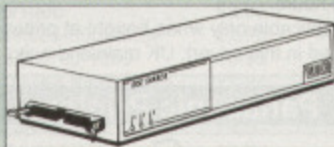


These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
<b>Disc Drive without PSU</b>		
• CLS35:	Single Disc Drive, 400K	£62
• CLD400S:	Twin Disc Drives, 800K	£109
<b>Disc Drive with PSU</b>		
• CS35:	Single Disc Drive, 400K	£83
• CD35:	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

## Disc Drive Sharer

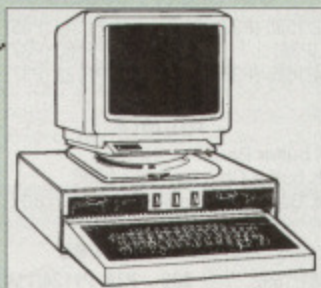


**(Ideal for educational establishments)**

A low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC Micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Price includes 3 Cables **£55**

## Disc Drives in Monitor Stand



• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

**£165**

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

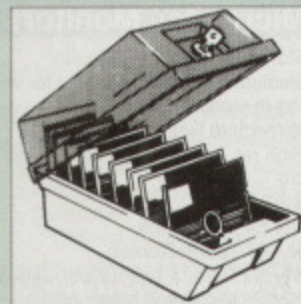
**£154**

## Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

**Price £4**

## Antistatic Lockable Disc Storage Units

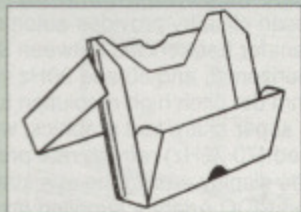


Gives double protection – Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.

• M35 – holds up to 50 5.25" discs	£4.95
• M85 – holds up to 95 5.25" discs	£6.95
• M25* – holds up to 25 3.5" discs	£4.95
• M50 – holds 50 3.5" discs	£6.50
• M10 – holds 8 of No. 10 Data Cartridges	£15

\* Not lockable

## Plastic Library Cases



Holds up to 10 x 3.5" Discs.	£1.50
Holds up to 10 x 5.25" Discs.	£2.00

## Dust Covers (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

## Disc Albums

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

**£4**

## Special Bulk Offer on Discs

(Supplied packed in Anti-Static Lockable Storage Units)  
(Lifetime warranty on Discs)



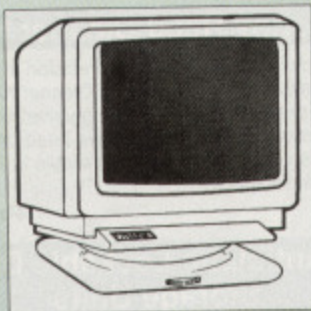
**PRICES SLASHED**

## BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£30	£35	£40
• With Sleeves 5.25"	£33	£38	£43
• 3.5" D/S D/D	£29 for 50	£52 for 100	

**Continued** → → → → → → → →





### Microvitec Monitors

- 1431 - Standard Resolution Monitor £169
- 1451 - Medium resolution, suitable for word processing in mode 0 £209
- Cub3000 Medium Res for A3000 £189
- 1441 - High res, exceeds the capabilities of the BBC Micro £359
- 2040 CS 20" Hi Res £675
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

### Multiscan Colour

- |                      |      |               |       |
|----------------------|------|---------------|-------|
| • Eizo 9060S         | £389 | • NEC 5D      | £1179 |
| • Eizo 9070S         | £579 | • Taxan 770LR | £370  |
| • NEC 2A             | £245 | • Taxan 775   | £369  |
| • NEC 3D             | £323 | • Taxan 795   | £405  |
| • NEC 4D             | £629 | • Taxan 875   | £669  |
| • VDC Enhancer Board |      |               | £25   |

(P.S. Taxan 795 monitor is supplied with a FREE VDC enhancer board)

**NEW**

### Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

**£325**

### Philips Monitors

- BM7502 12" Hi-res Green Monitor £67
- BM7522 12" Hi-res Amber Monitor £67
- CM8833 14" Med. Res Colour Monitor £170
- TV Tuner for CM8833 Monitors £62
- Dust Cover for Philips Monitors £6

FREE Swivel Base with Philips CM8833!

### STAR BUY

- PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

**ONLY £169**

### Spare Monitor Leads

- BNC Lead for Zenith or Philips £3
- Skart Monitor Lead £5
- RGB lead for TAXAN Monitors £3
- Archimedes Colour Monitor Lead £7.50

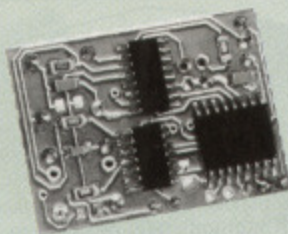
### Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improve contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

**£12**

**NEW**

### Watford VDC Enhancer



This unique VDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

**Super VGA VDC Card:** This provides support for both VGA and Multisync monitors. A unique electronic design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control

**£45**

**Multivideo VDC Card:** As above but for MultiScan monitors only.

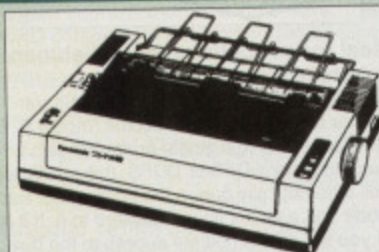
**£25**

### FREE On-Site Maintenance

This month we are also offering at no extra cost to all our customers, 12 months, On-Site Maintenance on all Laser Printers, Roland Plotters and of course the full range of Archimedes Micros. Should the machine fail, simply telephone the maintenance engineer, who will call in within 12 working hours.

(Offer applicable only when bought at prices advertised in this advert. UK mainland only).

### Panasonic Printers



- |             |      |            |      |
|-------------|------|------------|------|
| • KX-P1081  | £105 | • KX-P1180 | £99  |
| • KX-P1123  | £144 | • KX-P1624 | £285 |
| • KX-P1124I | £194 | • KX-P1654 | £399 |
| • KX-P1170  | £POA | • KX-P1695 | £285 |

### Panasonic Accessories

#### Cut Sheet Feeders

- |                     |      |                |      |
|---------------------|------|----------------|------|
| KX-P1592/1595 (P32) | £175 | KX-P1540 (P35) | £175 |
| KX-1124 (P36)       | £79  | KX-P1180 (P37) | £66  |
| KX-P1624/1695 (P38) | £124 | KX-P1123 (P37) | £66  |

#### Buffers

- |  |     |
|--|-----|
| P12 4K buffer Board for 1081           | £55 |
| P42 32K buffer Chip for 1592/1595      | £16 |
| P43 32K Buffer Chip for 1540/1124/1180 | £16 |

#### Serial Interfaces

- |                |     |                |     |
|----------------|-----|----------------|-----|
| P17 P1081/1592 | £32 | P19 P1124/1180 | £49 |
|----------------|-----|----------------|-----|

### Citizen Printers

- |                           |          |              |      |
|---------------------------|----------|--------------|------|
| 120D Plus                 | £96      | 124D Printer | £139 |
| Produt 9                  | £196     | Produt 24    | £219 |
| Produt 9X                 | £245     | Swift 24#    | £205 |
| Swift 9                   | £129     | Swift 24X    | £264 |
| • Produt Cut Sheet Feeder |          |              | £120 |
| • Swift 24 Colour Option  |          |              | £29  |
| • Swift 24 Ribbons        | Black £4 | Colour £13   |      |

# Special Offer this month - A FREE Colour option cartridge with every Swift 24 printer purchased from us.

### Star Printers

- |   |      |
|---|------|
| • LC10 9pin 80col. 144/36 CPS             | £105 |
| • LC15 9pin 136col. 180/45 CPS            | £173 |
| • LC24-10 24pin 80col. 180/60 CPS         | £143 |
| • LC24-15 24pin 136col. 200/67 CPS        | £288 |
| • *FR10 9pin 300/76 CPS 31K 16 fonts      | £210 |
| • FR15 Wide carriage version of above     | £260 |
| • *XB24-10 24pin 80col. 240/80 CPS        | £269 |
| • XB24-15 24pin 80col. 240/80 CPS         | £345 |
| • XB-24 Colour Kit                        | £29  |
| • LC-200 Colour 9pin 80col. 180/45 CPS    | £152 |
| • LC-24-200 24pin 80col. 222/67 CPS       | £150 |
| • LC24-200 Colour 24pin 80col. 222/67 CPS | £217 |

\*FREE Colour Ribbon with these printers

### Star Accessories

#### Cut Sheet Feeder

- |                |     |              |      |
|----------------|-----|--------------|------|
| LC10/200/24-10 | £65 | LC15/LC24-15 | £125 |
| XB24-10        | £80 | XB24-15      | £139 |

#### Serial Interfaces

- |                                       |     |
|---------------------------------------|-----|
| SPC-10 LC10; LC10-II; LC10-Col; LC15; |     |
| LC24-10; LC24-15; LC-200; LC24-200    | £49 |
| 8K Ser LC-200; LC24-200; FR10; FR15;  |     |
| XB24-10; XB24-15                      | £64 |

#### Paper Roll Holders

- |                                   |     |
|-----------------------------------|-----|
| LC-200; LC24-200; LC24-200 colour | £29 |
|-----------------------------------|-----|

#### Buffers

- |  |     |
|--|-----|
| 32K Ram Card for LC/XB24-10; 15; LC200 | £55 |
|--|-----|

#### Ribbons

- |                     |           |            |
|---------------------|-----------|------------|
| LC10; LC10-II; LC15 | Black £4; | Colour £6  |
| LC-200; LC24-200    | Black £5; | Colour £12 |
| XB24-10; XB24-15    | Black £5; | Colour £12 |

### Laser Printers

- |                                       |        |       |
|---------------------------------------|--------|-------|
| • Canon LBP-4                         | 4ppm   | £580  |
| • Canon LBP-8 IIIIR                   | 8ppm   | £1499 |
| • Canon LBP-8 IIIT                    | 8ppm   | £1365 |
| • Epson EPL7100                       | 6ppm   | £619  |
| • HP Laserjet III                     | 8ppm   | £999  |
| • HP Laserjet IIID                    | 8ppm   | £1569 |
| • HP Laserjet IIIP                    | 4ppm   | £629  |
| • HP Laserjet IIIsi                   | 16ppm  | £2475 |
| • Panasonic KX-P4420                  | 8ppm*  | £599  |
| • Panasonic KX-P4450I*                | 11ppm* | £1015 |
| • Panasonic KX-4455 Postscript 11ppm* |        | £1469 |
| • Qume Crystal Print Publisher 2      |        | £1555 |
| • Star LP-8 II                        | 8ppm   | £929  |
| • Star LP-8 Star(post)script          |        | £1129 |
| • Star LP-4 4ppm                      |        | £689  |
| • Star LP-4PS Postscript 4ppm         |        | £799  |

\* Now with 2 years On-site warranty

#### Laser Toners

- |               |     |                        |     |
|---------------|-----|------------------------|-----|
| Canon 2 & 4   | £54 | KX-P4420/50            | £22 |
| Epson GQ      | £18 | Laserjet III/P & III/P | £55 |
| Epson EPL7100 | £95 | Laserjet II/D, III/D   | £70 |
| Star LP-8     | £69 | Qume Crystal           | £56 |

#### Laser RAM Upgrades

- |                 |      |                |      |
|-----------------|------|----------------|------|
| • IIP & III 1MB | £74  | • EPL7000 2M   | £365 |
| • IIP & III 2MB | £109 | • GQ5000 512K  | £95  |
| • II & IID 1MB  | £76  | • KX4420/50 1M | £115 |
| • II & IID 2MB  | £112 | • KX4420/50 2M | £159 |
| • II & IID 4MB  | £299 | • KX4420/50 4M | £349 |
| • Canon LBP4 1M | £175 | • Star LP8 1M  | £143 |
| • Canon LBP8 2M | £150 | • Star LP8 2M  | £285 |

#### Laser Drum & Developer

- |                       |        |     |           |      |
|-----------------------|--------|-----|-----------|------|
| • Epson Drum          | GQ5000 | £93 | EPL7100   | £129 |
| • Panasonic 4420 Drum |        | £60 | Developer | £59  |
| • Panasonic 4450 Drum |        | £93 | Developer | £80  |
| • Qume Drum           |        | £76 | Developer | £56  |

#### Jetpage Postscript Cartridge

- |              |      |            |      |
|--------------|------|------------|------|
| • HP IIP/III | £255 | IID & IIID | £265 |
|--------------|------|------------|------|

#### NEW - HP Laserjet

- |                         |      |
|-------------------------|------|
| Various Font Cartridges | £45  |
| Superset Font           | £195 |

### Integrex Colour Jet

- Colour Jet 132 Printer £499
- Paper Roll £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £19.50
- Black Cartridge £11.25
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123



## Hewlett-Packard Printers

• # Desk Jet 500	£285	• Paintjet XL	£999
• Desk Writer (Mac)	£480	• Quiet Jet Plus	£350
• Desk Jet Cartridge	£15	• HP Think Jet	£232
• Paint Jet Colour	£569	• Rugged Writer	£825

# Now 3 years extended Parts & Labour warranty

• Paintjet Cartridges Black	£19;	Colour	£25
• Desk Jet 500 256K RAM cartridge			£129
• HP Epson FX Emulation Cartridge for Desk Jet			£59

HP Apple Talk Interfaces for			
• Scan Jet	£299	• Paint Jet	£POA
• Desk Jet Unlimited (Book No VAT)			£19.75

## Canon Bubblejet Printers

Printer	CSF	D'ble Bin	Ink Cart
BJ10E	£178	£43	£18
BJ300	£320	£88	£12
BJ330	£374	£110	£12
• Spare Battery pack for BJ10E			£33

## NEC Pinwriter Printers

• P20	£175	• P70	£446
• P30	£237	• P90	£635
• P60	£345		

## Epson Printers

DFX5000	£1059	LQ860 Colour	£459
DFX8000	£1985	LQ1050+	£459
EX1000 Colour	£428	LQ1060 Colour	£609
FX850	£272	LQ2550+	£685
FX1050	£346	LX400	£105
FX1060	£595	LX850	£146
LQ400	£156	SQ850	£425
LQ550	£204	SQ2550	£628
LQ850+	£377		

### Cut Sheet Feeders for

LX400/800/850/LQ400/500/550	£69
EX800/FX800/850/LQ800/850	£130
FX/LQ 1000/1050/SQ850	£159
LQ 2550	£390
	SQ2550 £390

### Tractor Feed for

LQ800	£44;	LQ850/FX850	£69;	LQ1050/
FX1050	£85;	LQ2500	£90;	LQ2550
				£90.

### Accessories

• EX800/1000 Colour Option	£45
• EX800/1000 Colour Ribbon	£14
• LQ2500 Colour Option	£65
• Multifont Card for LQ550/850/1050	£95

## Epson Printer Interfaces

All these interfaces fit inside the printer

RS232	£32	RS232 + 2K Buffer	£52
IEEE 488	£95	RS232 + 8K Buffer	£75

## Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£4
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

## Concept Keyboards

Standard A3 Keyboard with BBC Software	£143
Standard A4 Keyboard with BBC Software	£117
Archi A3 Keyboard	£144
Archi A4 Keyboard	£118



**CREDIT CARD 24 HOUR**  
**Ansaphone Hot Lines**  
 (0923) 50234 or 33383

## Plotters

• HP7440	£415	• HP7475	£599
<b>Roland Plotters</b>			
• DXY1100	£499	• DXY1200	£629
• DXY1300	£830	• DXY2500	£2375
• DPX3500	£3289	• Sketchmate	£315
• Roland plotter Pens, Fibre tip			£7.50

## Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
• 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£21
• 1,000 Sheets 15" x 11" Fanfold Paper	£9
• 2,000 Sheets 15" x 11" Fanfold Paper	£16
• 1,000 Sheets true A4 Fanfold Paper 70gms	£11
• 2,000 Sheets true A4 Fanfold Paper 70gms	£21
• Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

## Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

## Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£6.00	—
BBC Micro	—	£3.50
BBC Master	—	£4.00
Archimedes Micro pair	—	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	—
FX/MX/RX100/1000	£3.95	—
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	—
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.50	£5.00
SQ2500	£8.00	£5.50
Star LC10/NL10	£2.75	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet		
Cartridges (set of 4)	£6	

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

## Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595	£6
P115 for KX-P1180	£7
P145 for KX-P1124	£7
P140 for KX-P1540	£8
P155 for KX-P1624	£8
Colour Ribbons for KX-P1081, 1592 & 1595	
Brown, Blue or Red	£9 each

## Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments i.e. one above the other, the desk space required for your printer functions is

effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)

132 Column version £29 (carr. £4)

## Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires).

(Ideal for School environments)

Connects	Serial	Centronics
2 to 1	£16	£17
3 to 1	£22	£24
5 to 1	£32	£36

(Cables extra at £6 each. Please specify type required when ordering)

## 2 Way Compact Printer Switch

A handy 2 way printer switch. Enables one micro to be connected to 2 printers or vice versa.

Centronics £18; Serial £17

(Cables extra at £6 each)

## Auto Printer Sharer Switch

Connects	Serial	Centronics
2 to 1	£40	£45
4 to 1	£62	£59
8 to 1	—	£89

## 256k Multi Spooler

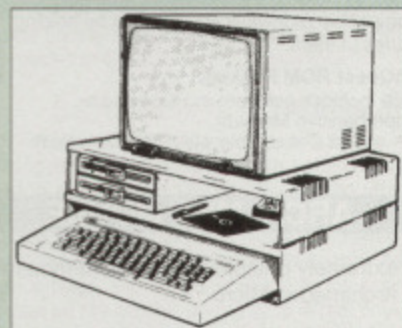
These Auto Centronics Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	£135	• 4 In/2 out	£169
• 8 In/1 out	£199		

## Compact Converter Units

Serial to Parallel £36 Parallel to Serial £37

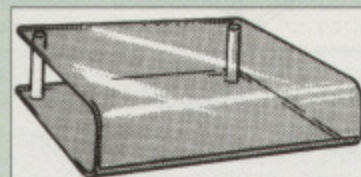
## Plinths for the BBC B & Master 128K Micros



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26
(Carr. Single plinth £2; double plinth £3)		

## Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Continued → → → → → → → →



## QUEST MOUSE Mk III



- Quest Mouse III & Quest Paint **£59**
  - Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont **£89**
  - Quest Mouse III only **£30**
  - Quest Paint Software only **£34**
  - Quest Font Disc (22 Text Fonts) **£15**
  - Quest Mouse Mat (Red or Blue or Green please specify) **£3**
  - Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer **£18**
- (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

## ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

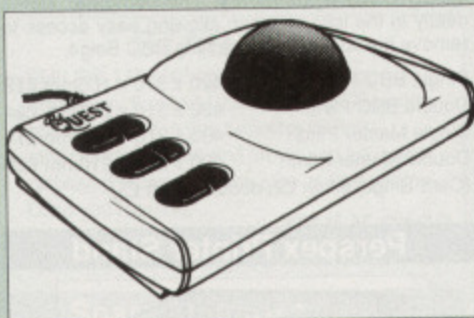
**ConQuest ROM Package** **£30**  
(Price includes software in ROM and a comprehensive Manual).  
(Not Compatible with BBC Compact)

## ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro **£32**

## Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



**QT-10 BBC/Master Version** **£27**  
**QT-20 Archimedes Version** **£30**

## RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible) **£45**  
RB2 including Quest Paint **£75**  
RB2-A for Archimedes **£46**

## THE NEW Mk III AMX MOUSE

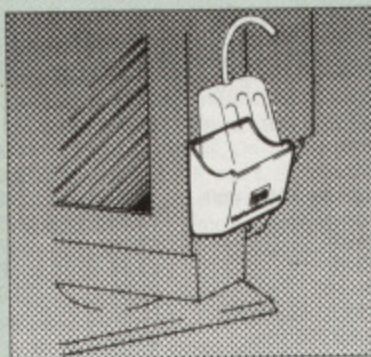
Inc. Super Art package

**ONLY: £59** (carr £3)

(Please specify for BBC, Master or Compact)

MOUSE MAT	<b>£3</b>
AMX MOUSE ONLY	<b>£29</b>
AMX SUPERART Package	<b>£34</b>
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	<b>£32</b>
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	<b>£13</b>
AMX DESIGN (ROM)	<b>£55</b>
AMX XAM Educational	<b>£15</b>
AMX EXTRA EXTRA	<b>£16</b>
AMX MAX A gem of desktop (ROM)	<b>£20</b>

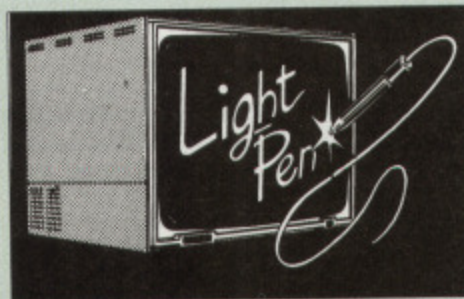
## WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk.

It protects it from damage when not in use, yet within easy reach when you need it again. At £4 it does not cost a rodent's ransom.

**Price £4**



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

**Only £21**

## FLEET STREET EDITOR

Software pack for BBC Micro	<b>£33</b>
Software pack for the Master	<b>£39</b>
Admin Xtra Disc Utility	<b>£13</b>
Fonts N Graphics Disc Utility	<b>£13</b>

## BEEB VIDEO DIGITISER



**"Test Bureau Approved for Use in Education"**

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

**£109** (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

## The Beeb HandScan

**Hand-held Scanner for the BBC Micro**



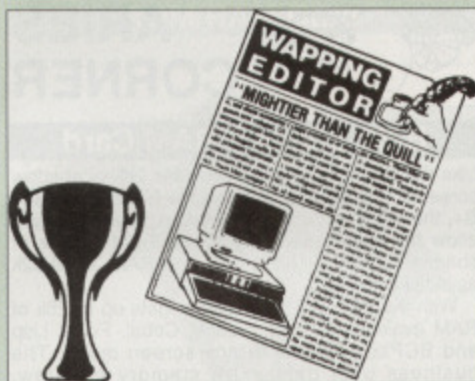
Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

**Beeb HandScan & Firmware** **£135**





**Winner of the BBC Acorn User 1990  
Award for the Best DTP/Word Processor**

## The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

## Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be - it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

## Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

## The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

**Wapping Editor Software Pack £59**  
**Wapping Editor plus Mouse £79**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

**NEW**

At the request of many of our customers we are now able to offer training in the use of Wapping Editor DTP package. For further information please telephone 0923 37774 and ask for Tim or Shiraz

## Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

**£15**

## Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.

Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.

Supplied complete with instructions.

**£12**

## Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

**£13**

## Laser Direct



By using the power of the Archimedes RISC processor, it offers the best of both worlds - print speed up to 5 times faster than typical Laserjet compatibles - uses outline fonts so that any font can be scaled to any size - works with all programs that use RISC OS printer drivers. Ideal for use with Genesis, IDraw, Acorn DTP, Impression, etc. Includes 50 sheet paper tray and a single sheet/envelope tray. Requires one expansion slot and at least a 2Mbyte Archimedes. A very compact printer, a very low initial cost and very low running costs.

**Special Price: £825**

- Special High Res Laser Direct Card 600 DPI for Canon LPB4 Laser Printer **£325**
- LPB8 Printer plus High Res Card **£999**

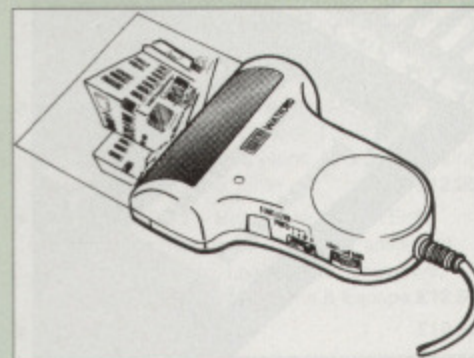
(For demonstration, call in at our retail shop)



**CREDIT CARD 24 HOUR  
Ansaphone Hot Lines  
(0923) 50234 or 33383**

**All prices are exclusive of  
VAT**

## Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £149. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

## SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (module) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

## SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are:

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.  
X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

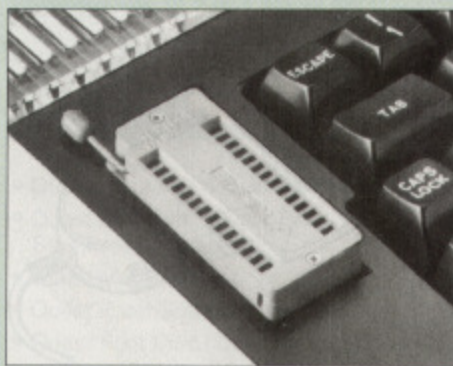
On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

**AHS-4 Archi 300/400 Version £149**  
**AHS-3 Archi A3000 Version £175**

**Continued → → → → → → → →**



## Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)
- BBC, B and B+ compatible.

**ONLY £18 (carr £3)**

## BBC B Low Profile Cartridge System

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

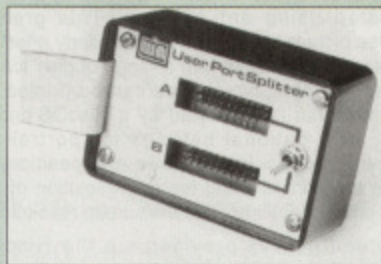
- Complete System **£11**
- Spare Cartridges **£2.75**
- Spare Rack **£1.65**

## ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£9**; Quad **£14**

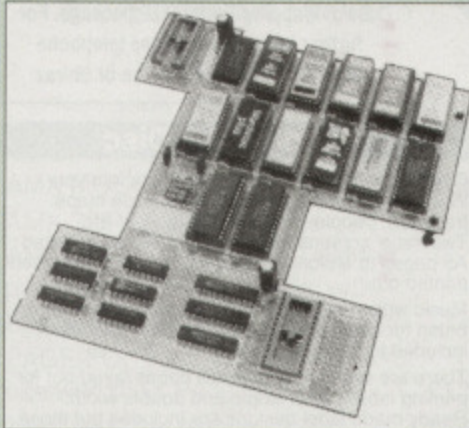
## User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

**Excellent Value at £22 (carr £2)**

## Solderless Sideways ROM Socket Board



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

**Price: Only £35**

**Battery Backup fitted £39**

**Battery Backup only £3**

**16K Sideways RAM £8.50**

**(carriage £3)**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

**Only: £8**

**NEW**

## Commander Joystick



Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

**Features:**

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

**Launch Price: £15**



## ARIES CORNER

### B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

- Recommended by Computer Concepts for use with their Inter series of ROMs.

**Price: £59 (carr. £3)**

### Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

**Price:** Aries B-12 **£36**  
Aries B-12C **£5**

### Aries B-488 IEEE-488 Interface Unit

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

**£238 (Carr £3)**

### Voltmace Joysticks

- Delta 3B Single Joystick **£10**
- Delta 3B Twin Joysticks **£15**
- Delta 3C Joystick for Compact **£10**
- Delta 14B Single Joystick **£11**
- Delta 14B/1 Adaptor Module **£12**
- Transfer Software Disc-Tape **£7**
- Delta-Cat A mouse eliminator Joystick for the Archimedes **£24**

### Delta Base B

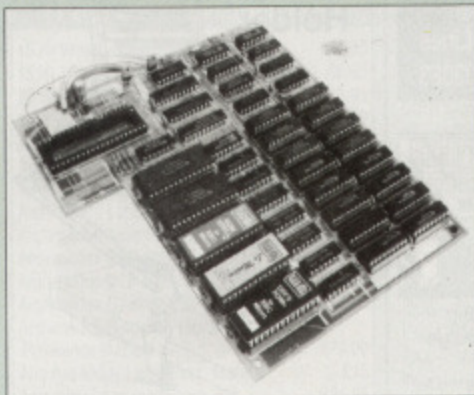


Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

**£25**



## ROM/RAM Card



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

### PRICES:

- ROM/RAM card with 32k dynamic RAM £45
- ROM/RAM card with 64k dynamic RAM £59
- ROM/RAM card with a massive 128k dynamic RAM £99  
(carriage on ROM-RAM Card £3)

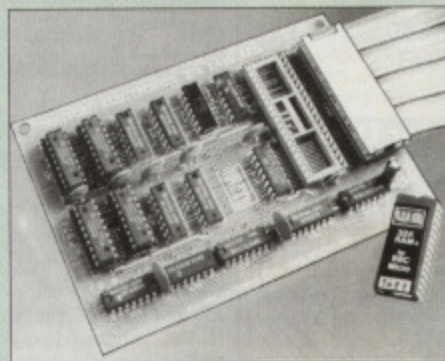
### OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit £9
- 16k Dynamic RAM for Upgrade £13
- Battery backup £3
- Read and Write protect switches £2 each
- Complete ROM-RAM board
- All options installed £115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

## 32K Shadow RAM/Printer Buffer Card Expansion Board



### A MUST FOR WORD PROCESSING

Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

• IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

• "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.

• In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

• Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

• Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (\*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

• Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

**Only £54** (carr £3)

(Price includes a comprehensive manual and the ROM)

## BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs £20.00
- Maths with a Story 2 (Disc). 4 further maths programs. £20.00
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs. £17.00
- ECOLOGY O-Level program. £20.00
- POLYMERS O-Level program. £20.00
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. £20.00
- ADVANCED TELETXT SYSTEM £8.65
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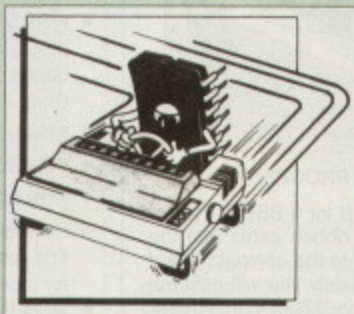
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Epson FX & RX 80	£10
Juki & Brother HR	£10

### View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, Hi80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

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Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips.

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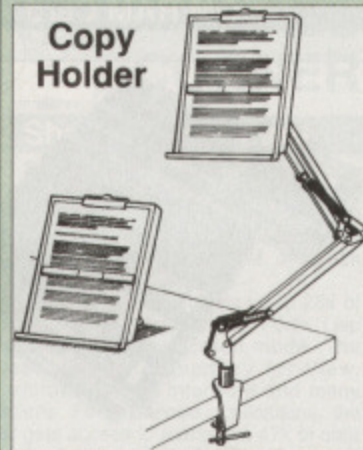
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#### Printer Commands Revealed

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This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

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Price: £15.95 (No VAT)

## The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material. Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc., and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work - even giving advice on writing and marketing your own programs. A book you will enjoy to use as a reference, or read from cover to cover, over and over.

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This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

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Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

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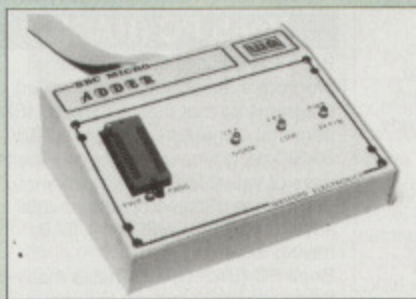
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## 28pin DIL Header Plug

SOLDER type £1.50 IDC CRIMP type £1.95

## 8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only £1.00

28 pin ZIF SOCKET (Textool) £6.95

## Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	£2.50
to 3 pin DIN Plug + 1 Jack Plug	£3.00
to 7 pin DIN Plug	£2.50
to 3 Jack Plugs	£3.00
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

## Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single £3.00; Dual £3.75

## Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable  
Single £4 Twin £6

## Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

## Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

## Watford POWER DUCK

£8

## CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIP D-RAM	£4.90
256K x 4-8 DIP	£4.75
256K x 4-8 ZIP	£4.80
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£3.00
27128A-250nS (12V5)	£2.50
27128-250nS (21V)	£4.00
27256-2	£3.00
27512-2	£4.50
27C101G (1 Meg)	£7.00
4013	75p
4020	£1.00
4164-10	£1.55
4464-10	£3.50
4816 RAM	£2.00
41256-8	£2.00
41256-10	£1.50
6264LP-8K	£4.00
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£4.00
6522A	£5.00
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	50p
74LS00	50p
74LS04	50p
74LS10	50p
74LS123	£1.00
74LS163	£1.00
74LS244	£1.00
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	£1.00
75159	£3.00
9637	£2.00
ICL7673PA	£3.00

## Assorted ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus	
User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£36
Acorn LISP	£19
Acorn OS B+	£25
Acorn OS 1.2	£14
Basic Editor	£24
BBC PCB Designer	£49
Beebmon	£22
Buffer & Backup	£20
Communicator	£49
Dump Out 3	£25
EPSON NLQ ROM	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
ICON Master	£28
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Micro Prolog	£25
Microtext Disc	£46
Microtext Rom	£199
NLQ DESIGNER	£25
Numerator - Archi	£69
Numerator - BBC	£39
Pendown ROM	£32
Rom Manager	£20
ROMIT	£29
SERIAL ULA	£13
TED	£35
Terminator B, B+	£28
Terminator Master	£32
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39



## NEW Hi-Speed, Low Cost Archi Hard Disc Card

Watford's NEW Innovative IDE interface card brings the latest advances in PC hard disc technology to within reach of the Archimedes user. Over the last few years PC hard disc manufacturers have been working towards the goal of integrating the drive controller onto the hard disc, eliminating the need for an expensive controller card.

Now this has been achieved and drives are available under names such as IDE (Integrated Drive Electronics) or ATA (AT Attachment). These drives require only simple interfacing to a PC motherboard and reduce the overall cost of installing a hard disc. Because of the integration of the controller and drive electronics onto one compact board, manufacturers have been able to include extra features into the drive, such as Caching, where tracks are buffered in fast memory, reducing access times and increasing throughput. All these benefits make IDE drives far more attractive than conventional ST506 drives or SCSI. Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the IFonts application.

A powerful security feature has been provided with the two unique commands \*IDELock and \*IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The IIDEForm Write Protect option is particularly useful in conjunction with \*IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

### Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

### Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- IIDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- IIDEFSDisk, creates PC emulator hard discs

### \*Commands

\*IDELock  
\*IDEUnlock  
! DEFS  
Selects the IDE filing system 'IDEFS'.  
\*IDEDrives  
Displays the configuration and native characteristics of installed drives.  
\*Configure IDEFSDirCache  
\*Configure IDEFSBuffers  
\*Configure IDEFSDrive

### Typical transfer speeds

Prairie Tek	20Mb	650K bytes per second
Seagate	43Mb	800K bytes per second

### Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£249
ADA 0530	100Mb	16mS	£395
ADA 0570	200Mb	15mS	£535
ADA 0580	330Mb	15mS	£POA

All the above 3.5" drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000 £85

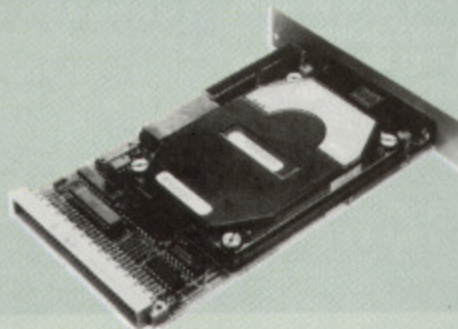
### Internal Hard Disc Drives for A3000

ADA 0700	21Mb	23mS	★£315
ADA 0720	44Mb	28mS	Available £TBA
ADA 0730	89Mb	18mS	Soon £TBA

Supplied complete with Podule, Fan, Cable & Fitting instructions.

★ Tentative Launch Price

### IDE Hard Card



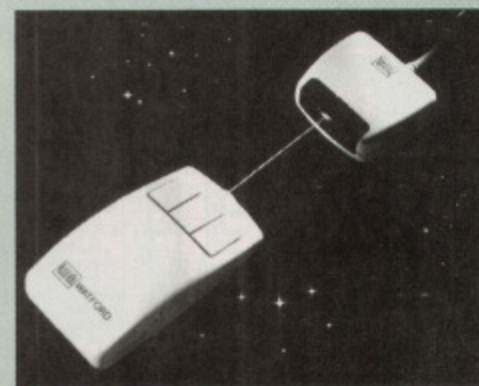
### 2.5" miniature Hi-Speed Hard Disc Drives on Controller Cards for Archimedes

"Simply plug and play"  
For Archimedes A300 and 400 series machines

ADA 0650	21Mb	23mS	£345
ADA 0660	44Mb	28mS	£495
ADA 0670	89Mb	18mS	£TBA

(Can be used as a Removable Hard Drive)

## NEW Archimedes Cordless Mouse



Ever found that using a mouse on a busy desktop has its problems? The cable is always being caught up in papers, tangled round equipment and other cables etc, and what about that cup of coffee spilled over your work!

Watford Electronics' new Cordless Mouse solves these problems by removing the cause for concern - replacing the cable with a simple infra red link. It still provides all the speed and easy control of a conventional mouse, but with complete freedom. In use, there are no operating differences between the standard mouse and the new cordless mouse so all mouse functions and mouse driven RISC software will be fully compatible. Pinpoint accuracy is ensured by a unique Accelerator button, which, when pressed, moves the pointer by just a tiny amount for a large slow movement of the mouse, but by a large amount for a quick wizz of the mouse.

### Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

**Price £65**

# Watford Electronics

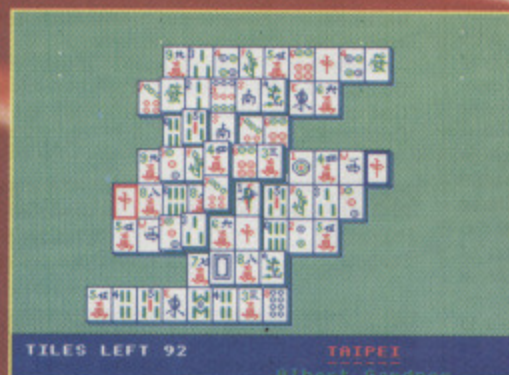
250 Lower High Street, Watford WD1 2AN, England  
Tel: 0923 37774/240588 Fax: (0923) 33642 Telex: 8956095

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GAME



# Taipei

*Albert Gardner presents his top class version of the popular Chinese game*



**T**AIPEI is an infuriatingly addictive patience game played with Mah Jong tiles. Although the rules are deceptively simple there is a great deal of strategy involved in winning.

The Mah Jong set consists of 36 different pieces: There are three suits called Bamboos, Circles and

Characters with numbers one to nine in each suit, although 1 Bamboo is depicted as a bird. Then there are four Winds – North, South, East and West – three Dragons (Red, Green and White), one Flower and one Season. Each occurs four times, so there are 144 tiles altogether.

In play the tiles are laid out in a five-layer pyramid and you have to

remove all the tiles in matching pairs. However, the only ones which can be removed are those at the ends of the rows on each level, and then only if they are not covered by a tile on a higher level.

This means, for example, that you cannot take the tiles in the two rows of two in the centre until the one at the very top has gone.

Notice that at the start of the game both ends of the two middle rows on the bottom level are blocked by single tiles spreading across both rows.

At the start the program asks for a deal number. For a random deal enter zero, or to ensure a different deal each time you play enter today's date, such as 120991 for September 12,

```
10 REM TAIPEI
20 REM by Albert Gardner
30 REM (c) The Micro User
40 MODE7
50 ENVELOPE1,1,0,0,0,0,0,0,0,-2,-2,
60,0
60 *FX212,0
70 *FX213,31
80 PROCprt("TAIPEI",5,2,1)
90 PROCprt("MAH JONGG PATIENCE",8,1,1)
):PROCprt("by",11,3,0)
100 PROCprt("Albert Gardner",13,6,1)
110 PROCprt("Deal Number",17,5,0)
```

```
:INPUTTAB(24,17)""MX
120 IFMX=0 MX=TIME:MX=0 ELSE PRINTTAB(
15,19);CHR$133;"Redeals ";:INPUT""MX
130 PAGE=&2100:CHAIN"TAI2"
140 :
150 DEFPROCprt(A$,LX,CX,DX)"
160 IF DX AS=CHR$141+AS
170 XX=(40-(LENAS))DIV 2 -1
180 FORY=L%TOLX+DX:PRINTTAB(XX,YX);CH
RS(128+CX);AS:NEXT
190 ENDPROC
```

```
10 = 0 0
20 = 0 0
30 = 0 0
40 = 8AFC C
50 = 3800 F
60 = 2726 B
70 = 7710 0
80 = 6275 3
90 = 24D1 F
```

Get it  
right ✓

```
100 = D16E D 150 = 686 6
110 = 6AE2 6 160 = 246E E
120 = AB13 1 170 = A5ED 4
130 = D4BD 7 180 = 2EBA 6
140 = 9719 1 190 = ED0F E
```

```
10 REM TAI2
20 REM by Albert Gardner
30 REM (c) The Micro User
40 *L.TAIDATA
50 *TAPE
60 CALL&4600
70 *TV0,1
80 MODE1:tX=&70:bX=&71:rX=&73
90 lX=&7A:fX=&7B:eX=&7C:uX=&7D
100 EX=&1AE0:FX=&1B70:GX=&1B98
110 tl=&1CC6:spr=&1D1D:prt=&938
120 blnk=&1DBD:off=&1E2E:chk=&1FC3:ch=
&1FC2:w=&2084;!&74=&C870C37
130 cX=&E27:dX=&1BC8:dX!37=1
140 VDU23,1,0;0;0;19,0,4;0;19,2,2;0;
150 PROCinit
160 OX=144:UX=2:VX=1:WX=0:REPEAT:CALLc
hk:PROCpair:UNTIL?ch=1
170 IF DX=2 PROCend
180 IF DX>3 NX=NX+DX-4:GOTO 150
190 MODE7:PRINTTAB(8,10)"Deal Number w
```





MICRO USER October 1991 103





GAME



```
910 DEFPROCu
920 CALLw:IFWx=5 PROCleft
930 ENDPROC
940 :
950 DEFPROCleft
960 IFWx=4 UX=7
970 REPEAT UX=UX-1:IFUX<FX?VX UX=GX?VX
980 CALLw:UNTIL Wx<5:ENDPROC
990 :
1000 DEFPROCrt
1010 IFWx=4 UX=8
1020 REPEAT UX=UX+1:IFUX>GX?VX UX=FX?VX
1030 CALLw:UNTIL Wx<5:ENDPROC
1040 :
1050 DEFPROCH:Hx=0
1060 COLOUR1:PRINTTAB(1,3)"HELP mode";
1070 REPEAT:Hx=Hx+1:UNTILdX:Hx:IFHx=37
GOTO1110
1080 PROCmark:UX=(cX?Hx)MOD16:VX=(cX?Hx
)DIV16:PROCV
1090 PROCsp:UX=(dX?Hx)MOD16:VX=(dX?Hx)D
IV16:PROCV:TX=GETAND&DF
1100 IFTXPROCC:IFTX=72 QX=0:GOTO 1070
1110 PRINTTAB(1,3)SPC(9);:COLOUR3
1120 ENDPROC
1130 :
```

```
1140 DEFPROCm
1150 QX=DX+2
1160 DEFPROCmark
1170 IFDX=1ANDUX=RXANDVX=SX ENDPROC
1180 KX=FNT(UX,VX,WX):IFKX=0 ENDPROC
1190 IX=UX:JX=VX:LX=WX:ITX=0:ITX=2121
1200 CALLspr:AX=QX:CALL&900
1210 ENDPROC
1220 :
1230 DEFPROCsp
1240 IF FNx VX=4:IFWx=4UX=7
1250 IFDX=0 DX=1:RX=UX:SX=VX:ZX=WX:ENDP
ROC
1260 IFRX=UXANDSX=VX DX=0:ENDPROC
1270 IFFNT(RX,SX,ZX)=FNT(UX,VX,WX) PROC
rem ELSE VDU7:PROCC
1280 ENDPROC
1290 :
1300 DEFPROCrem
1310 CALLoff:RX=UX:SX=VX:ZX=WX:CALLoff
1320 OX=OX-2:IF OX=0 GOTO1350
1330 IF DX=1 PROCrt ELSEIF DX=2 PROClef
t ELSE PROCdown
1340 PRINTTAB(12,1);SPC(4);TAB(12,1);OX
1350 DX=2:ENDPROC
1360 :
1370 DEFPROCC
1380 QX=1:PROCmark:DX=0:UX=RX:VX=SX:WX=
ZX:ENDPROC
```

```
10 = 0 0
20 = 0 0
30 = 0 0
40 = BE7 7
50 = CD93 B
60 = 4EBF 9
70 = DDCC 5
80 = 6BE1 7
90 = C8EA C
100 = 5085 5
110 = EBB9 F
120 = 57FF B
130 = C4C2 6
140 = 746A 2
150 = DEBB B
160 = 443D 0
170 = 9E13 A
180 = 2D1E 2
190 = DDB 9
200 = FD2E F
210 = 9719 E
220 = 344C 7
230 = 3FED B
240 = CF22 A
250 = BD46 5
260 = 9329 A
270 = FEAT 4
280 = 512F C
290 = 5A0B 6
300 = 99DB A
310 = 68BF A
320 = F0B4 E
330 = 4C66 9
340 = A843 3
350 = BF78 2
360 = F783 2
370 = 8706 C
380 = 52B6 5
390 = 7D4F C
400 = A757 A
410 = ED0F 7
420 = 9719 2
430 = 1021 3
440 = BC48 3
450 = 2D2E A
460 = 707E 1
470 = 737E D
480 = C78F E
490 = BF5C E
500 = 37DD 3
510 = E2A 7
520 = ED0F 9
530 = 9719 1
540 = EB41 A
550 = 725C F
560 = 9719 1
570 = 9E0 D
580 = 6FF6 7
590 = 9719 7
600 = 906B 5
610 = E25F 2
620 = 94E8 E
630 = A885 6
640 = 4CAA 5
650 = 5304 8
660 = 7163 A
670 = 631F D
680 = FDB2 D
690 = 451 5
700 = DA07 A
710 = D541 3
720 = D1A4 D
730 = D79F C
740 = ED0F 5
750 = 9719 7
760 = 958C 9
770 = F37D 1
780 = 50C8 6
790 = F64F C
800 = ED0F A
810 = 9719 C
820 = A9FD 8
830 = E35C 4
840 = 3908 B
850 = F64F D
860 = ED0F 7
870 = 9719 2
880 = 6855 9
890 = 1C26 A
900 = D1AD D
910 = 5836 6
920 = BDB2 A
930 = ED0F 4
940 = 9719 A
950 = 68C6 A
960 = 3EA8 7
970 = EE1B 8
980 = 1DA1 7
990 = 9719 7
1000 = 4C9F 2
1010 = CF47 5
1020 = AE84 D
1030 = 1DA1 5
1040 = 9719 8
1050 = C11B F
1060 = 1725 D
1070 = CB11 4
1080 = 561E 7
1090 = E624 1
1100 = EC8E 9
1110 = 750A F
1120 = ED0F D
1130 = 9719 F
1140 = CB0F D
1150 = C3D 7
1160 = EEDB 8
1170 = CEF5 F
1180 = DF6C 7
1190 = 90AF 0
1200 = DF5F D
1210 = ED0F A
1220 = 9719 D
1230 = 3F2A F
1240 = DECB 4
1250 = EE6D 2
1260 = 4E45 5
1270 = 6E0E 3
1280 = ED0F C
1290 = 9719 7
1300 = 9801 4
1310 = C562 8
1320 = 4206 8
1330 = CFE7 6
1340 = 962F C
1350 = FEA9 F
1360 = 9719 F
1370 = 2AC1 7
1380 = BE8F A
```

```
10 REM TAIPEI DATA GENERATOR
20 REM by Albert Gardner
30 REM (C) The Micro User
40 MODE7:HIMEM=85400:VDU28,0,24,39,20
50 FORIX=85400 TO 85424 STEP 4
60 !IX=&F5FAF5FA:NEXT
70 FORIX=85460 TO 86930 STEP 4
80 READ AS:!IX=EVAL("&"+"A$"):NEXT
90 FORIX=86A00 TO 86A3C STEP 4
100 READ AS:!IX=EVAL("&"+"A$"):NEXT
110 PRINT"READY TO SAVE - PRESS A KEY"
120 A=GET
130 *SAVE TAIDATA 5400 6440 3000 3000
140 END
150 DATA DDDDD99FF,FF8DDDD,EFEEFFFF
160 DATA E8F9E8F8,7F7F3FDF,BABBBB77
170 DATA EEEEEEE,EE6E6EE,88FFFFF
180 DATA FFFFFFFF,CB5DEAF9,CFCFC7CB
190 DATA F3C300B9,FFFB7B7B,EEEEEE22
200 DATA EEEEEEE,FFFFFFF,FFFFFFF
210 DATA FFEFEFEF,FFFFFFF,7FFFFFFF
220 DATA FFFF7F,EEEEEEE,EEEEEE
230 DATA DD55BBFF,FF1177BB,FEFEFFFF
240 DATA FEFEFEFE,F7F7FFFF,F7F7F7F7
250 DATA EEEEEEE,EEEEEEE,FFFFFFF
260 DATA FFFFFFFF,FFFFFFF,FEFEFEFF
270 DATA FFFF7F7F,F7F7F7FF,EEEEEEEE
280 DATA EEEEEEE,FFFFFFF,FFFFFFF
290 DATA FEFEFEFE,FFFFFFF,F7F7F7F7
300 DATA FFFF7F,EEEEEEE,EEEEEE
310 DATA FFBBCCF,CCBBFFEE,7676FFFF
320 DATA FE7676FE,F7F7FFFF,F7F7F7F7
330 DATA EEEEEEE,EEEEEEE,FFFFFFF
340 DATA FEFEFEFF,FFFFFFF,F7F7F7F7
350 DATA FFFF7F7F,FEFEFEFF,EEEEEEE
360 DATA E6E6E6EE,FEFEFEFE,FFFFFFE
370 DATA F7F7F7F7,FFFFFFF,FEFEFEFE
380 DATA FFFFFE,E6E6E6E6,EEEEEE
390 DATA 99DDFFFF,DDDD0055,F9F9FFFF
400 DATA F9F9F9F9,F9F9FFFF,F9F9F9F9
410 DATA EEEEEEE,EEEEEEE,FFFFFFF
420 DATA FFFFFFFF,FFFFFFF9,F9F9F9FF
430 DATA FFFF9F9F,F9F9F9FF,EEEEEEE
```

```
440 DATA EEEEEEE,FFFFFFF,FFFFFFF
450 DATA F9F9F9F9,FFFFFFF,F9F9F9F9
460 DATA FFFF9F,EEEEEEE,EEEEEE
470 DATA FFEFEFEF,FEFEFEFE,E6E6EEFF
480 DATA F7E6D5F7,76FE33FF,FE76BABA
490 DATA E6E6EEEE,E6E6E6E6,FFFFFFFE
500 DATA FEFEFEFF,FEFEFE7E,E7E7E7EF
510 DATA 7F7F7E7E,7E7E7E7F,EEEEEE6E
520 DATA E6E6E6EE,FEFEFEFE,FFFFFFE
530 DATA F7F7F7F7,FFFFFFF,FEFEFEFE
540 DATA FFFFFE,E6E6E6E6,EEEEEE
550 DATA 7654BBFF,FEBA5432,F6F6FFFF
560 DATA F6F6F6F6,F6F6FFFF,F6F6F6F6
570 DATA E6E6EEEE,E6E6E6E6,FFFFFFFE
580 DATA FEFEFEFF,FFFFFFF6,F6F6F6FF
590 DATA FFFF6F6F,F6F6F6FF,EEEEEE6E
600 DATA E6E6E6EE,FEFEFEFE,FFFFFFE
610 DATA F6F6F6F6,FFFFFFF6,F6F6F6F6
620 DATA FFFF6F,E6E6E6E6,EEEEEE
630 DATA DDEE88FF,FFBB88DD,EFEEFFFF
640 DATA FEFEFEFF,FF7FFFFF,FF7F7F7F
650 DATA EEEEEEE,EEEEEEE,FEFEFEFF
660 DATA FEFEFEFE,E6E6E6FF,FFFFFFE6
670 DATA 767676FF,FFFF7676,E6E6E6EE
680 DATA EEEEE6E6,FEFEFEFE,FFFFFFE
690 DATA E6E6E6EE,FFFFE6,76767676
700 DATA FFFF76,E6E6E6E6,EEEEEE6
710 DATA FEFEFFFF,FEFEFEFE,F7F7FFFF
720 DATA F1F4F6F7,FEFEFFFF,F8F2F6FE
730 DATA E6E6EEEE,E6E6E6E6,FFFFFFFE
740 DATA FEFEFEFF,EEDE6F3,F1F3E6DD
750 DATA 77BB76FC,F8FC76BB,EEEEEE6E
760 DATA E6E6E6EE,FEFEFEFE,FFFFFFE
770 DATA F7F7F6F4,FFFFFFF,FEFEF6F2
780 DATA FFFFFE,E6E6E6E6,EEEEEE
790 DATA 5454BBFF,FF32DC98,E7E7FFFF
800 DATA FFE7E7E7,E7E7FFFF,FF7E7E7E
810 DATA E6E6EEEE,EEEEEE6E,FEFEFEFF
820 DATA FFFFEEFE,E7E7E7FF,FFFFE7E7
830 DATA 7E7E7E7F,FFFFE7E7,E6E6E6EE
840 DATA EEEEE6E6,FEFEFEFE,FFFFFFE
850 DATA E7E7E7E7,FFFFE7E7,E7E7E7E7
860 DATA FFFF7E,E6E6E6E6,EEEEEE
```

```
870 DATA DFD9FFF,FFFF8FDF,FFFFFFF
880 DATA 7788FFFF,FFFFFFF,DD33FFFF
890 DATA EEEEEEE,EEEEEEE,DDDDDEE
900 DATA FFEEDDD,CE7F7BFC,77FCBE7
910 DATA 7DFD7BE6,DDE6BFD,666666EE
920 DATA EEE66666,FFFFFFF,FFFFFFF
930 DATA FFFF88,FFFFFFF,FFFFFFF33
940 DATA FFFFFF,EEEEEEE,EEEEEE
950 DATA DF5FBFFF,FF1F7FDF,FFFFFFF
960 DATA BBAABBC,FFFFFFF,BBBB77
970 DATA EEEEEEE,EEEEEEE,FFFFFFF
980 DATA FFFFFFFF,FFFFFFF,FBFCFFFF
990 DATA FFFF77,F7F7FFFF,EEEEEEE
1000 DATA EEEEEEE,FFFFFFF,FFFFFFF
1010 DATA FFFCFBFA,FFFFFFF,FF7F7F7F
1020 DATA FFFFFF,EEEEEEE,EEEEEE
1030 DATA BEDE3FFF,FFFF3FDE,FAFE1FF
1040 DATA FFFF1FE,FFFFFFF,FFFFFFF
1050 DATA EEEEEEE,EEEEEEE,FFFFFFF
1060 DATA FFFFFFFF,FBFCFFF,FFFCFBF
1070 DATA FBFB7FFF,FFFF7FDF,EEEEEEE
1080 DATA EEEEEEE,FFFFFFF,FFFFFFF
1090 DATA EEEFFFFF,FFFEAE,AAEE1FF
1100 DATA FF11EE,EEEEEEE,EEEEEE
1110 DATA 5F9FDFDF,EEEEDFDF,FFFFF
1120 DATA AAEE1FF,FFFFFFF,FAFBFCFF
1130 DATA EEEEEEE,EAEE6EE,FFFFFFEE
1140 DATA FFFFFFFF,FFFF11EE,F1FFFFFF
1150 DATA FFFFFCFB,CCFFFFF,EEEEEE6E
1160 DATA 66EEEEEE,FFFEFEFE,FFFFFFF
1170 DATA F1FEFAFE,FFFFFFF,CCBBAABB
1180 DATA FFFFFF,66AAAAAA,EEEEEE
1190 DATA 9FBFBFFF,EE8E6FEF,FFFFFFF
1200 DATA AAEE1FF,FFFFFFF,FAFBFCFF
1210 DATA EEEEEEE,EAEE6EE,FFFFFFEE
1220 DATA FFFFFFFF,DFEF11EE,F1EFD0F
1230 DATA DF3FFCFB,CC3FDF5F,EEEEEE6E
1240 DATA 66EEEEEE,FFFEFEFE,FFFFFFF
1250 DATA F1FEFAFE,FFFEFEFE,CCBBAABB
1260 DATA FFFFFF,66AAAAAA,EEEEEE
1270 DATA 7E5EBFFF,FFBF5F1E,FAFE1FF
1280 DATA FFFF1FE,FAFBFCFF,FFFFFFCFB
1290 DATA EAEE6EE,EEEEEE6E,FFFFFFF
```

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1300 DATA FFEFEFEF,1FFFFFFF,1FEFAFEF
1310 DATA CFFFFFFF,CBFAFBF,6EEEEEE
1320 DATA 6EAEEAE,EEFFFFF,FFFEFF
1330 DATA AFEF1FFF,FF1FEF,AFBFCFFF
1340 DATA FFCFBF,AAE6EEE,EE6EAE
1350 DATA BEDF1FFF,FF7F7FBE,FDF3FFFF
1360 DATA FDFDF2FD,FFFFFFF,FBFB7F7F
1370 DATA EEEEEEE,EEEEEEE,FFFFFFF
1380 DATA EFEFFFFF,FFFFFFFE,DFDF3FFF
1390 DATA FEFDFDF6,BFBFCFFF,E6EAEAE6
1400 DATA 6E6EEEE,EEFFFFF,FFFEF
1410 DATA DF3FFF3F,FF3FDF,BFCFFCF
1420 DATA FFCFBF,6EEEEEE,EEEEEE
1430 DATA 9F6F9FFF,FFFF9F6F,666699FF
1440 DATA 6699FF99,BBBBCCFF,BBCCFFCC
1450 DATA 6666EEEE,66EEEEEE,FFFFFFF
1460 DATA FFFFFFFF,99FF9966,FF996666
1470 DATA CFFCCBB,FFCCBBB,EEEEEE6E
1480 DATA EEE6666,FFFFFFF,FFFFFFF
1490 DATA 99666699,FFFFFFF,CCBBBCC
1500 DATA FFFFFF,EE6666EE,EEEEEE
1510 DATA BBBBCCFF,9F5FBFCF,5555EEFF
1520 DATA FFFFEEFE,AAAA7FFF,FFFFFF77
1530 DATA CCC22EE,EEEEEE22,BFC3FDF
1540 DATA FFFCFBF,5FEFFFFF,FFFEF5F
1550 DATA AF7FFFFF,FFFF7FAF,CE2EEEE
1560 DATA EEE2ECE,DDDDDDDD,FF0FFFF
1570 DATA F5FEFFFF,FFFE5F,FAF7FFF
1580 DATA FFF7FA,ECE2EEE,EE2EC
1590 DATA DDCCFFF,DDDDDDDD,FF0FFFF
1600 DATA 77773300,FF0FFFF,DDDD9911
1610 DATA 6666EEEE,66666666,DDDDDDDD
1620 DATA DDDDDDD,77777777,77777777
1630 DATA DDDDDDD,DDDDDDDD,66666666
1640 DATA 66666666,CCDDDDDD,FFFFFFF
1650 DATA FF0033,FFFFFFF,FF1199
1660 DATA FFFFFF,66666666,EEEEEE
1670 DATA FFFFFFFF,FFFFFFF,FFFFFFF
1680 DATA EFEFFFFF,FFFFFFF,FF7FFFFF
1690 DATA EEEEEEE,EEEEEEE,FFFEFFFF
1700 DATA FFFFFFFF,8F6F0F6F,FEFEFEFE
1710 DATA 5FEF1FFF,FFFFFFBF,EEEEEEE
1720 DATA EEEEEEE,FFFFFFF,FFFFFFF
```





GAME

1730 DATA FFFFEFEF,FFFFFF,FFFFFFF  
1740 DATA FFFFFFFF,EEEEEEEE,EEEEEE  
1750 DATA FFFFFFFF,FFFFFFF,FFFFFFF  
1760 DATA FBDF8FC,FDFFFFF,FBF4F3D  
1770 DATA EEEEEEEE,EEEEEE6E,FDFFFFE  
1780 DATA FFFFFFFF,FAFAF4FB,F5DFCF9  
1790 DATA F9FAFOFD,F2F9F3FD,EEE2EEEE  
1800 DATA EEEEEEEE,FFFFFFF,FFFFFFF  
1810 DATA FFFFFFFA,FFFFFF,FFFFFFFE  
1820 DATA FFFFFF,EEEEEEE,EEEEEE  
1830 DATA AF9FBFFF,FFFFFFBF,7F7F7FFF  
1840 DATA BBEEFF7F,FFFFFFF,333377FF  
1850 DATA EEEEEEEE,EEEEEEE,EEFFFFF  
1860 DATA DDEEFFFF,BBDBB011,FFB3399  
1870 DATA 11557777,88447777,EEEEEEEE  
1880 DATA EEEEEEEE,FFFFFFF,FFFFFFF  
1890 DATA FFFFFFFF,FFFFFFF,FFFFFFF  
1900 DATA FFFFFF,EEEEEEE,EEEEEE  
1910 DATA 5F7F7FFF,FFFAFAF,7F7F7FFF  
1920 DATA FFFCFFFF,FFFFFFF,FF33CCFF  
1930 DATA EEEEEEEE,EEEEEEE,FFFFFFF  
1940 DATA FFFFFFFF,6600EEFF,FFFF88BB  
1950 DATA AA00BBB,FF9922FF,66EEEEEE  
1960 DATA EEEEEEE6,FFFFFFF,FFFFFFF  
1970 DATA FFFFFFFF,FFFFFF,FFFFFFF  
1980 DATA FFFFFF,EEEEEEE,EEEEEE  
1990 DATA 9FBF8FFF,FFFBFBF,FFFFFFF  
2000 DATA 88EEEEFF,FFFFFFF,33FF77FF  
2010 DATA EEEEEEEE,EEEEEEE,FFFFEEFF  
2020 DATA FFFFFFFF,446600EE,AACC88AA  
2030 DATA 55D011FF,BB773399,EEEEEEEE  
2040 DATA EEEEEEEE,FFFFDDEE,FFFFFFF  
2050 DATA CCAEE66,FFFFEE,FFFFEEDD  
2060 DATA FFFFFF,EE2266EE,EEEEEE  
2070 DATA DFBFCFFF,FDFAFEF,FF7FFFFF  
2080 DATA EEEEEEE6,FFFFFFF,FFFFFFF  
2090 DATA EEEEEEEE,EEEEEEE,FFFFFFF  
2100 DATA FFEFFFFF,EEEEEE,4444BB55  
2110 DATA 33FFFF77,66EE6688,EEEEEEEE  
2120 DATA EEEEEEEE,FFFFFFF,FFFFFFF  
2130 DATA FFFF7766,FFFFFF,FFFFDDEE  
2140 DATA FFFFFF,EEEEEEE,EEEEEE  
2150 DATA 9FBF8FFF,FFFBFBF,9FBFFFFF  
2160 DATA F8FA6F6F,FFFFFFF,DFFFFFF  
2170 DATA EEEEEEEE,EEEEEEE,EFFFFFFF  
2180 DATA FCFDFEFE,FDFFCFD,F4F5F5FD  
2190 DATA F5F1FFF3,7F7F7F1,EEEEEEEE  
2200 DATA EEEEEEEE,FFFFFFF,FFFFFFF  
2210 DATA FCFBF7F6,FFFFFF,7F7F7F7  
2220 DATA FFFFF7,EEEEEEE,EEEEEE  
2230 DATA 88AADDF,FFFFFEAA,FFFFFFF  
2240 DATA F3F2EFF,FFFFFEFF,74F3F377  
2250 DATA EEEEEEEE,EEEEEEE,FFFFFFF  
2260 DATA FFFFFFFF,EDE2EEFF,FFFFEE2  
2270 DATA FDFFF70,7773F9F8,EEEEEEEE  
2280 DATA EEEEEEEE,FFFBFCFF,FFFFFFF  
2290 DATA FFF3E0F3,FFFFFF,FFFFF0BB  
2300 DATA FFFFFF,EE6666E6,EEEEEE  
2310 DATA FEFCCFFF,FCFEFEF,FFFFFFF  
2320 DATA F7FFCCFF,FFFFFFF,FFFF7788  
2330 DATA EEEEEEEE,EEEE6666,FFFFFFF  
2340 DATA FFFFFFFF,EF8FFFFF,AF8FFFCF  
2350 DATA FF3F7FFF,BF3FFF3F,EEEEEEEE  
2360 DATA EEEEEEEE,FFCEFFFF,FFFFFFF  
2370 DATA 6F0FA8F,FFFF9F,2F0FBF3F  
2380 DATA FDFDFE,6E6EEEE,EEEEEE  
2390 DATA FDFEFFFF,FCFEFFFF,FBF7FFFF  
2400 DATA F3EEF7FB,CCFFFFF,FF00FF33  
2410 DATA EEEEEEEE,66EEEEEE,FFFFFFF  
2420 DATA FFFFFFFF,EF8FFFFF,AF8FFFCF  
2430 DATA FF3F7FFF,BF3FFF3F,EEEEEEEE  
2440 DATA EEEEEEEE,FDFFFFFF,FDFFFFFF  
2450 DATA FBE6FFFF,FBEAF7FB,FF00FFFF  
2460 DATA FF00FF11,EEEEEEEE,66EEEEEE  
2470 DATA FFFFFFFF,FFFFFFF,EF8FFFFF  
2480 DATA AF8FFFCF,FF3F7FFF,BF3FFF3F

2490 DATA EEEEEEEE,EEEEEEE,FEFFFFF  
2500 DATA FFF8DFD,7F7F7FFF,7E2E6E6  
2510 DATA 88FFFFFF,3388AA22,22EEEEEE  
2520 DATA EE22AAAA,FFFFFFF,FFFFFFF  
2530 DATA EF8FFFFF,AF8FFFCF,FF3F7FFF  
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2550 DATA FDFCFFFF,FCFBFFFC,FFF7FFFF  
2560 DATA FFD5E6FF,EEFFFFF,446600  
2570 DATA 66EEEEEE,66EEEEEE,FFFFFFF  
2580 DATA FFFFFFFF,EF8FFFFF,AF8FFFCF  
2590 DATA FF3F7FFF,BF3FFF3F,EEEEEEEE  
2600 DATA EEEEEEEE,FFCFFFCF,FCFBFBFB  
2610 DATA F7FFFFF,EEF7FEE,BB99FFFF  
2620 DATA FF66BB00,66EEEEEE,6666EE22  
2630 DATA FFFFFFFF,FFFFFFF,EF8FFFFF  
2640 DATA AF8FFFCF,FF3F7FFF,BF3FFF3F  
2650 DATA EEEEEEEE,EEEEEEE,FFCFFFCF  
2660 DATA FFEFFFFF,BF3FFF3F,EEFF7F7F  
2670 DATA 33FFFFF,CC3399AA,66EEEEEE  
2680 DATA 6666EE22,FFFFFFF,FFFFFFF  
2690 DATA EF8FFFD,AF8FFFCF,FF3F7FFF  
2700 DATA BF3FFF3F,EEEEEEE,EEEEEEEE  
2710 DATA FBCFFFFF,FBFBFCFB,77FFFFF  
2720 DATA EF67FFFF,BB8BFFFF,7766CCDD  
2730 DATA EEEEEEEE,2266EEEE,FFFFF7FC  
2740 DATA FFFFFFFF,EF8FFFD,AF8FFFCF  
2750 DATA FF3F7FFF,BF3FFF3F,EEEEEEEE  
2760 DATA EEEEEEEE,FBFCFFFF,FBFFFCFB  
2770 DATA F7FFFFF,E6F7F7E6,55FFFFF  
2780 DATA EEE55500,EEEEEEE,6666EEEE  
2790 DATA FFFFFFCF,FFFFFFF,EF8FFFFF  
2800 DATA AF8FFFCF,FF3F7FFF,BF3FFF3F  
2810 DATA EEEEEEEE,EEEEEEE,45374537  
2820 DATA 4536452C,45364536,BC020D45  
2830 DATA 4520DC1E,45454545,2C364536  
2840 DATA 45464546,0,0  
2850 DATA 48D00A9,1C058D1C,8D1C068D  
2860 DATA 10A21C07,6E1C014E,13901C00  
2870 DATA 181C06AD,8D1C026D,7AD1C06  
2880 DATA 1C036D1C,6E1C078D,66E1C07  
2890 DATA 1C056E1C,CA1C046E,AC06D0D0  
2900 DATA 1C00428,9C01E30,30AD1A10  
2910 DATA A0A0A04,A804286D,D90424AD  
2920 DATA 8301B7D,CD1898B9,3100424  
2930 DATA AD600A9,4C90430,70AD04D0  
2940 DATA 24AD601B,F001C904,300EC904  
2950 DATA 1E691806,2003D0A8,E0B91C8E  
2960 DATA 30AE601A,AE0DD004,C0BD0428  
2970 DATA 246D181B,6088A804,A0A0A8A  
2980 DATA 28AD8985,72850A04,E5383BA9  
2990 DATA 8572E589,A72A589,246D180A  
3000 DATA 65146904,FB0DCA89,30AD60A8  
3010 DATA A90B1004,42C8D00,88801A9  
3020 DATA A90CB0D,43208885,42C8D1A  
3030 DATA 8A93AF0,1A97C85,24AD7D85  
3040 DATA D002C904,428AD07,1EF004C9  
3050 DATA 200424CE,4F01C43,7C8500A9  
3060 DATA CE0424EE,43200428,A904F01C  
3070 DATA EE7D8500,1D200428,938201D  
3080 DATA 8500A96D,858A8586,1C018D8C  
3090 DATA AD1C038D,AA8042C,86260A0A  
3100 DATA A86260A,89858626,260A86A6  
3110 DATA 101D0C86,8589650D,86658A85  
3120 DATA 86850E69,69180FD0,A58585A0  
3130 DATA 85116986,8501A986,8578A98C  
3140 DATA 8502A987,8504A988,430CD84  
3150 DATA 808509D0,81854FA9,AD1E244C  
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3170 DATA A91ED004,1C008D20,8D0424AD  
3180 DATA 8201C02,1C04AD1C,8085A469  
3190 DATA 691C05AD,D0818550,430AD7B  
3200 DATA A1001C9,878500A9,84858885  
3210 DATA 850A03F0,424AD84,EE1C028D  
3220 DATA 20A91C02,201C008D,4AD1C08  
3230 DATA AD80851C,81851C05,8D80A9  
3240 DATA 8D07A91C,28AD1C01,1C028D04

3250 DATA AD1C0820,80651C04,5AD8085  
3260 DATA 6981651C,A5818530,84E53880  
3270 DATA 2B08085,80A581C6,8587E538  
3280 DATA E581A58D,AD818588,2C90430  
3290 DATA 80A50A3D,808508E9,81C602B0  
3300 DATA 300430AD,85012904,48AD608A  
3310 DATA 4248D04,8D044CAD,68AD0428  
3320 DATA 4308D04,44D004C9,A904288D  
3330 DATA 1B708D00,850430CE,8571857D  
3340 DATA 857C8573,8521A97D,A97B857A  
3350 DATA 4248D07,EE1CC620,C6200424  
3360 DATA 428EE1C,C90428AD,A9E8D0D6  
3370 DATA 1B948D10,A91B958D,1B8C8D00  
3380 DATA 601BBD8D,A91C8E20,1AE09900  
3390 DATA 308D8085,428CE04,EE1F5B2D  
3400 DATA 5B200428,428EE1F,CE1F5B2D  
3410 DATA 30EE0428,F08DA504,430CEE4  
3420 DATA AD0430CE,AD04668,4286D0A  
3430 DATA 1B70B9A8,D00424CD,169180B  
3440 DATA A91B7099,4108D01,CD1B98B9  
3450 DATA BD00424,9901E938,2A91B98  
3460 DATA B904108D,70D91B98,A90F101B  
3470 DATA 1B709910,989900A9,8D03A91B  
3480 DATA 2A90410,A904408D,A9718501  
3490 DATA CE708500,7B200428,428EE1F  
3500 DATA 718500A9,EE1F7B2D,40AD0428  
3510 DATA AE708504,6300430,8D026918  
3520 DATA 7B20044D,428CE1F,AD0430EE

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3530 DATA 5C90430,24ADCD0,F001C904  
3540 DATA 300EC904,428AD31,2AD004C9  
3550 DATA A90428EE,430BDF,CE1EB74C  
3560 DATA 71200424,424EE1F,EE1F7120  
3570 DATA 71200424,424CE1F,1C432060  
3580 DATA 1A904D0,A9608085,A9738501  
3590 DATA 857A8521,424CE7B,EE1CC620  
3600 DATA A90424,C6207385,424EE1C  
3610 DATA 7A8508A9,30AE7B85,3002E004  
3620 DATA 8510A904,3001E07B,1003E00E  
3630 DATA 8510A906,A904D07A,207A8518  
3640 DATA 24CE1CC6,A9060004,1FC28D01  
3650 DATA F0043CAD,454ADAD,AD04488D  
3660 DATA 4C8D0458,45CAD04,A904688D  
3670 DATA 9D24A20D,C89D0E27,F7D0CA1B  
3680 DATA 4588EE8,F01B988D,4548D72  
3690 DATA AD20842D,248D0454,F001C904  
3700 DATA 300EC904,98D909FD,3DF005C9  
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3740 DATA 43204804,BE68A81C,5D00E27  
3750 DATA F00E2799,1BC89908,C28D00A9  
3760 DATA 458AC1F,AD0454CE,70D90454  
3770 DATA 200C301B,5CAD2084,3005C904  
3780 DATA AEE61096,8E0D458,EC4C0310  
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3800 DATA 468AD04,60045C8D,5C8E05A2  
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3820 DATA 1B70D904,98D909FD,CAD0F01B  
3830 DATA 8E60E810,4260045C,4420DC20  
3840 DATA 46463346,2C424643,46334343  
3850 DATA 46354644,4545452C,45364545  
3860 DATA 4C040D41,3620DC1E,45454536  
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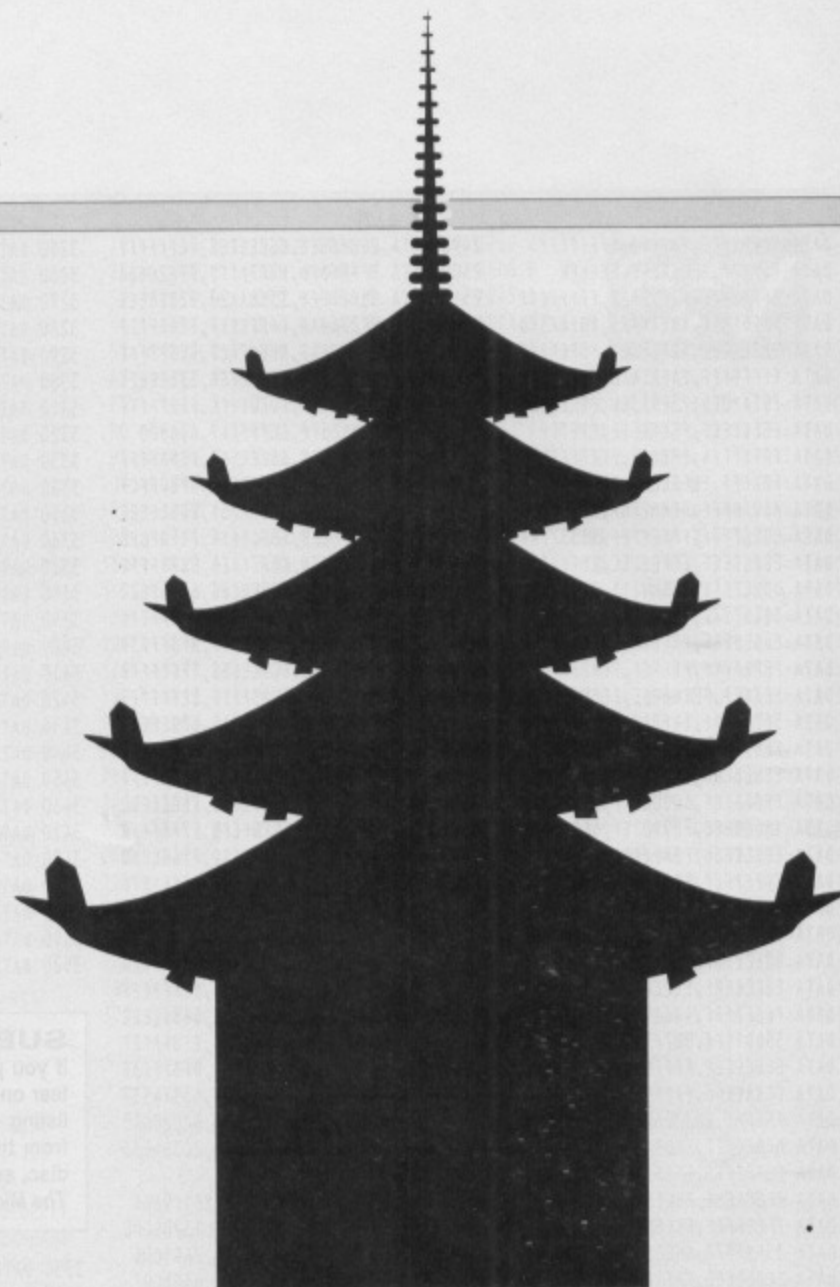
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3940 DATA A98E8577,C348D00,8D0C358D  
3950 DATA 1A90C36,5D0D7985,798500A9  
3960 DATA 55F07DA5,71058BA5,80A54FD0  
3970 DATA 81A57E85,87A57F85,80A510D0  
3980 DATA 858D938,E981A58D,4C8185D2  
3990 DATA 80A5096D,8508E938,C602B080  
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4010 DATA 17AD02F0,C80AF02D,9F07AC4  
4020 DATA 7691898,D027C0A8,857EA5EF  
4030 DATA 857FA58D,8500A981,ABF207D  
4040 DATA 72857DA5,71A503A2,1E0D4F0  
4050 DATA A04D0D,2F073A5,E82010AD  
4060 DATA A98200A,C40A842D,C026F07A  
4070 DATA A5EF0D2D,D079058A,D08BA51C  
4080 DATA D003E00B,2980B107,C8809177  
4090 DATA 200ACD2D,84200A98,D028C00A  
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4120 DATA 8BA525F0,2E01D0D,8CA50ED0  
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4150 DATA A509A24C,A55CD079,A907F08B  
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4170 DATA AD21D0,BF08AA5,CC2982B1  
4180 DATA 82911109,A90A5B4C,C880917D  
4190 DATA 882980B1,18988091,C4A80769  
4200 DATA A924B07B,C88091F0,809100A9  
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4220 DATA 20AD608D,332980B1,C0C88091  
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4260 DATA E581A58D,4C818588,84C50ABF  
4270 DATA 80A51ADD,85876518,6581A58D  
4280 DATA 38818588,8E980A5,81A58285  
4290 DATA 838500E9,2980B16D,8BA54833  
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4310 DATA 5CC2985,AD94C89,68D079A5  
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4370 DATA A8FA52D,85CC290A,D07DA589  
4380 DATA D018C019,F003E004,9018C00A  
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4400 DATA 80B10B52,89053329,866D08091  
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4440 DATA 2082918D,A20C0D,3C989A5  
4450 DATA 2C0D6D0,599072B0,6CD001C9  
4460 DATA 689D06C0,18C04FB0,8AA5189D  
4470 DATA 492041D0,C989A50C,C0D6D003  
4480 DATA 9051BD1A,D001C93C,901EC04B  
4490 DATA A532BD47,D003C989,90DACC0F  
4500 DATA F010C02E,F011C02A,C064C26  
4510 DATA 32D001C9,18B016C0,17F0D0CE  
4520 DATA 13F0D0FC,200C064C,4C0C09  
4530 DATA D08AA50C,F078A506,A508D00F  
4540 DATA B132F078,AD8D818D,80910C34  
4550 DATA 2D08DE6,89A68EE6,F078A56D  
4560 DATA 8180B122,D33298D,264C0C35  
4570 DATA F078A50C,8180B112,DCC298D  
4580 DATA 80910C36,C2F2D06D,A10C004C  
4590 DATA 6080918D,708500A9,30A97285  
4600 DATA EA97185,3A27385,A9462F20  
4610 DATA A2738511,462F20D0,84851CA9  
4620 DATA 2F2005A2,8509A946,2004A273  
4630 DATA AD60462F,9170B10D,F9D08872  
4640 DATA 73E671E6,60FD2D0CA





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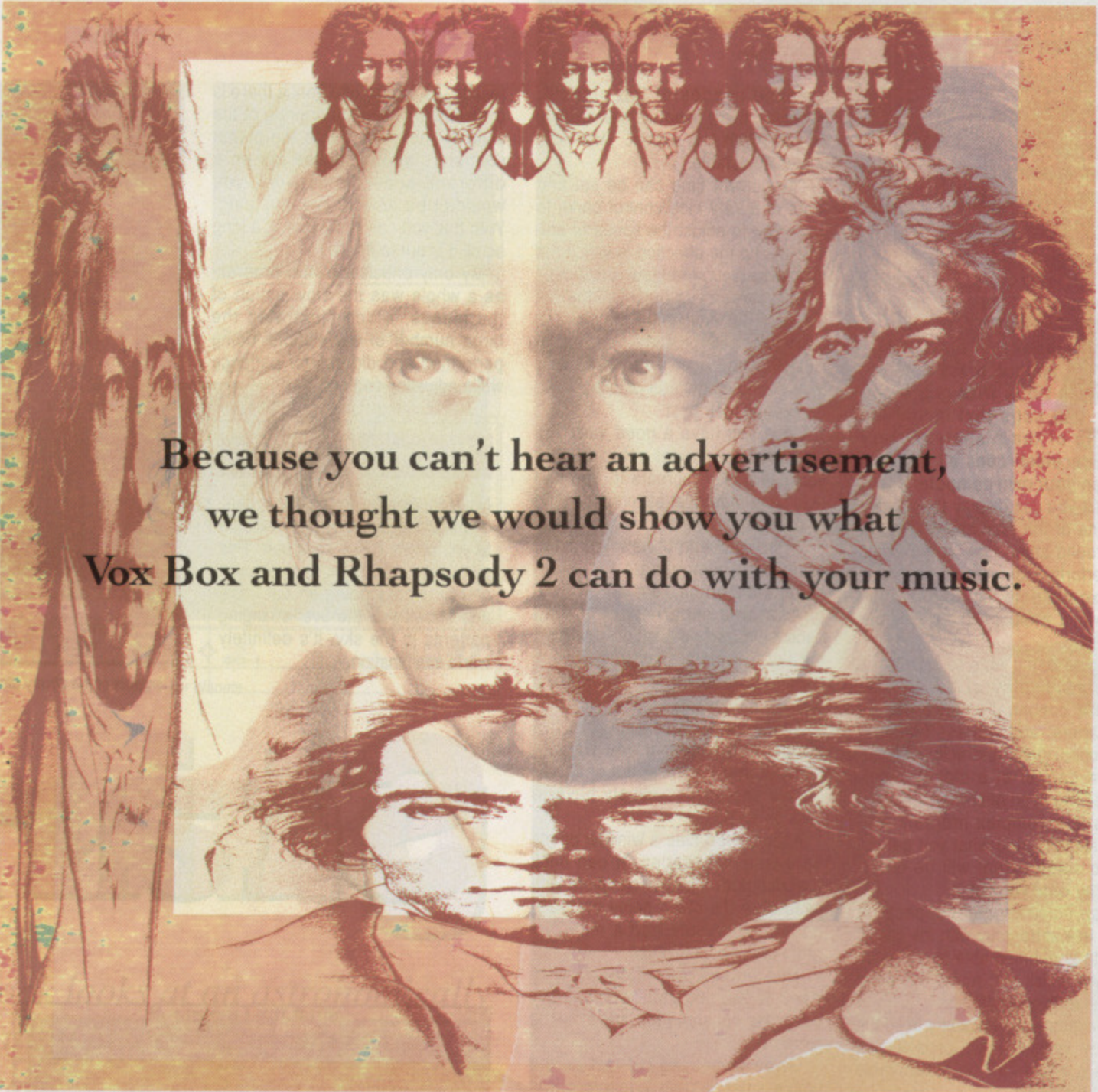
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30 = 0 0	780 = 76DD 9	1530 = EEDA 1	2280 = 14E3 2
40 = 278C C	790 = 580F B	1540 = 8FA0 5	2290 = 8E54 2
50 = 5C43 6	800 = 6AB8 4	1550 = 0945 4	2300 = 99EA F
60 = E7C 8	810 = 8F9F 1	1560 = B100 A	2310 = E3F8 2
70 = B9FD D	820 = 5E8A C	1570 = 9010 C	2320 = CCED E
80 = 17C5 7	830 = 999B 3	1580 = E4D3 E	2330 = C3A5 8
90 = 7296 0	840 = 2842 0	1590 = 2478 8	2340 = 196A F
100 = 17C5 4	850 = 673D 5	1600 = E299 0	2350 = A26D 9
110 = 3C8C 9	860 = 7A53 7	1610 = 50A0 7	2360 = 5921 C
120 = BC1B E	870 = F377 F	1620 = C864 2	2370 = 5523 E
130 = 68C2 2	880 = 88C9 B	1630 = B5DF C	2380 = BC3C 2
140 = FD2E A	890 = 87BB 5	1640 = B759 F	2390 = 2A16 E
150 = C5C3 6	900 = B689 8	1650 = 639C 0	2400 = 94B3 C
160 = D979 A	910 = E09 D	1660 = F8E3 B	2410 = 2B5F F
170 = A5FA D	920 = 4B27 5	1670 = D027 E	2420 = 196A 6
180 = C6AD 0	930 = 6EC7 B	1680 = AA05 2	2430 = A26D B
190 = 830A 9	940 = 6333 4	1690 = DAD9 7	2440 = 58CE B
200 = 6115 B	950 = 4E30 1	1700 = 604 D	2450 = 32EE 7
210 = 1A26 5	960 = 536F 3	1710 = 91A1 6	2460 = 45E0 8
220 = 6FBD 7	970 = 4105 6	1720 = 6115 6	2470 = CCDB 3
230 = 809D B	980 = 74C8 1	1730 = 5B91 E	2480 = 965D 3
240 = E070 2	990 = BBCD 0	1740 = 6333 7	2490 = 9987 E
250 = 4105 3	1000 = 6115 9	1750 = D027 E	2500 = 4913 3
260 = 677 B	1010 = A659 C	1760 = C7D0 E	2510 = A7DA 0
270 = 8515 E	1020 = 6333 5	1770 = 7E78 B	2520 = 450D F
280 = 6115 1	1030 = 11BE 7	1780 = 9639 E	2530 = 7CC7 2
290 = 3CA0 7	1040 = 3EA7 0	1790 = A373 2	2540 = B6DA 9
300 = 29D6 3	1050 = 4105 F	1800 = 6115 3	2550 = 17BD E
310 = 4748 F	1060 = 474 A	1810 = 47FB 6	2560 = 6F9E 3
320 = A1E6 C	1070 = 1DD5 A	1820 = 6333 4	2570 = 66FA 7
330 = 4105 5	1080 = 6115 B	1830 = 61EF D	2580 = 196A B
340 = 262 4	1090 = 52E6 1	1840 = 6FE2 2	2590 = A26D 9
350 = 2855 8	1100 = 716A 5	1850 = 51F2 0	2600 = 80DD C
360 = 8B07 A	1110 = 4D57 4	1860 = C1A4 7	2610 = F63C A
370 = 5647 A	1120 = 6FFC 5	1870 = BBDB 2	2620 = 1F6B 3
380 = 76DD A	1130 = D86D 8	1880 = 6115 8	2630 = D06D C
390 = FD64 F	1140 = AEC8 A	1890 = 536 C	2640 = 965D 7
400 = EAE9 3	1150 = A4C 2	1900 = 6333 3	2650 = 6252 9
410 = 4105 0	1160 = ABF2 C	1910 = B467 C	2660 = 580E 6
420 = 418A C	1170 = 3C25 B	1920 = B8D7 A	2670 = 3491 A
430 = C38F D	1180 = E32C 9	1930 = 4105 A	2680 = F307 A
440 = 6115 D	1190 = 601 8	1940 = 5F56 E	2690 = F432 E
450 = E924 A	1200 = 6FFC B	1950 = 9125 5	2700 = B6DA 5
460 = CC8A A	1210 = D86D 5	1960 = F6F9 6	2710 = D833 C
470 = 30A6 4	1220 = 29C3 8	1970 = 536 3	2720 = E621 3
480 = C256 1	1230 = FD4F E	1980 = 6333 4	2730 = 5F36 0
490 = 8B07 2	1240 = ABF2 4	1990 = F7FC 7	2740 = 6753 1
500 = 2C75 C	1250 = 3C25 4	2000 = 20E9 4	2750 = A26D 3
510 = 979D 5	1260 = E32C C	2010 = 8389 C	2760 = 9943 1
520 = 8B07 4	1270 = A709 4	2020 = 5A2B 2	2770 = C1D 9
530 = 5647 B	1280 = E48 2	2030 = AC66 D	2780 = B4D1 B
540 = 76DD E	1290 = 19D8 D	2040 = FA1D C	2790 = 466D E
550 = F34B B	1300 = F9BC 7	2050 = D062 8	2800 = 965D 8
560 = A063 9	1310 = 5C17 6	2060 = E9EA 1	2810 = 2459 8
570 = 8B07 5	1320 = 1171 2	2070 = 7C46 4	2820 = B832 F
580 = C803 E	1330 = 10D4 F	2080 = F779 3	2830 = 2BA9 3
590 = 916D 9	1340 = 38F1 9	2090 = 4105 5	2840 = 4405 1
600 = 8B07 9	1350 = 321D F	2100 = F9D2 F	2850 = 1CED 7
610 = 2719 B	1360 = 6805 1	2110 = 1F76 5	2860 = 6298 4
620 = 1DFC 4	1370 = 4105 7	2120 = 6115 C	2870 = EE37 D
630 = 5595 C	1380 = 2B89 8	2130 = 3F11 C	2880 = 3F13 D
640 = 7E84 C	1390 = BBED D	2140 = 6333 7	2890 = DC65 4
650 = 2E05 D	1400 = EB27 7	2150 = 90E2 5	2900 = EA0B 4
660 = A9AB F	1410 = 6D09 D	2160 = B325 A	2910 = FD4C 7
670 = 331E 6	1420 = 3753 6	2170 = 8970 5	2920 = 2EAF 7
680 = 2842 7	1430 = 36D3 6	2180 = 9803 F	2930 = 8131 8
690 = 1663 3	1440 = 18 1	2190 = 7455 A	2940 = BC3B 7
700 = 1172 F	1450 = D038 2	2200 = 6115 B	2950 = D69F D
710 = E68F 6	1460 = A5FF 4	2210 = 9C59 9	2960 = 7ECF 8
720 = 7562 E	1470 = 86C4 F	2220 = 29D6 A	2970 = 6829 5
730 = 8B07 D	1480 = 4B27 0	2230 = 2E93 2	2980 = 7694 B
740 = 4049 3	1490 = 52E 9	2240 = EDED 3	2990 = 748D A
750 = D0D5 4	1500 = E193 2	2250 = 4105 A	3000 = 47AD A



3010 = 2096 0	3360 = 4CDB 2	3710 = 237F C	4060 = 681B E	4360 = 7E14 1
3020 = 79CA F	3370 = 6304 6	3720 = FCF5 5	4070 = 98B0 A	4370 = C76F 8
3030 = D925 3	3380 = BA71 8	3730 = E921 0	4080 = B35C 0	4380 = 19D6 E
3040 = 5BA8 8	3390 = C185 A	3740 = 7D5E E	4090 = 3CAF 8	4390 = D298 6
3050 = 74EE 2	3400 = 86DF 1	3750 = 3A4F F	4100 = E1FF 0	4400 = B343 0
3060 = 8C02 0	3410 = 8B45 A	3760 = B9EF 9	4110 = B62D 3	4410 = B013 7
3070 = 7109 A	3420 = 6A78 8	3770 = F510 0	4120 = 23E1 6	4420 = 6A42 E
3080 = C453 D	3430 = CE68 F	3780 = 3DC8 D	4130 = 5291 6	4430 = D138 A
3090 = E0EB 0	3440 = 9AF4 E	3790 = DA06 D	4140 = 4358 9	4440 = B4D 4
3100 = 86D6 4	3450 = 4E3E C	3800 = BABC 1	4150 = 4034 A	4450 = 4EF7 B
3110 = F664 8	3460 = 15C6 C	3810 = 92B8 5	4160 = 76B6 1	4460 = 56D4 1
3120 = FC9A 2	3470 = 8A5E 3	3820 = 29E7 A	4170 = 84C0 5	4470 = DEC6 2
3130 = 3870 7	3480 = CE3B E	3830 = 7A58 2	4180 = D6C2 0	4480 = C558 5
3140 = 4824 6	3490 = E0F8 C	3840 = FA3F 6	4190 = 62A7 0	4490 = 3DFC D
3150 = 52D4 C	3500 = 8BAE 7	3850 = E6CE F	4200 = 96AC A	4500 = ADAE 7
3160 = 8B3F 8	3510 = 3787 2	3860 = 68B9 9	4210 = F9D0 D	4510 = 37A 2
3170 = 63C4 3	3520 = 92DC 4	3870 = 96C4 B	4220 = 16A4 A	4520 = B065 9
3180 = D7FE 9	3530 = B4B9 4	3880 = 7B55 F	4230 = 18BA F	4530 = E3A0 D
3190 = 7819 9	3540 = 4AF7 5	3890 = 8739 D	4240 = DCC 8	4540 = 4BE5 F
3200 = 6F5A 0	3550 = 2C86 A	3900 = 12F5 4	4250 = 4B8B C	4550 = 9A7D E
3210 = E4BF 2	3560 = 7ED7 4	3910 = 6388 C	4260 = 3026 2	4560 = CC5A 0
3220 = 8836 D	3570 = D599 1	3920 = 697E F	4270 = FD80 6	4570 = C309 3
3230 = 6DC6 B	3580 = 327E 4	3930 = D667 8	4280 = B0BF 9	4580 = FD30 4
3240 = FD4A 9	3590 = EEC1 B	3940 = E341 C	4290 = BCFO F	4590 = 3C6A 8
3250 = 8D6 0	3600 = 8631 E	3950 = 8766 B	4300 = B271 2	4600 = CB22 B
3260 = 9AA9 F	3610 = D84F 4	3960 = A119 E	4310 = 7BDB C	4610 = 1192 8
3270 = F44C C	3620 = 9C6D E	3970 = 29D9 4	4320 = FE69 3	4620 = CB4A B
3280 = 62CB A	3630 = D541 7	3980 = C696 B	4330 = 85CA 7	4630 = E131 A
3290 = 31E1 0	3640 = A67D 7	3990 = 629E 0	4340 = BBAD B	4640 = 27DE C
3300 = C553 B	3650 = BF96 7	4000 = 826E 7	4350 = 205E E	
3310 = A8A6 5	3660 = 182C F	4010 = 4DAA E		
3320 = C0CF A	3670 = 4122 5	4020 = 2E52 B		
3330 = 2D82 7	3680 = FF78 3	4030 = E94C 9		
3340 = 2BA9 4	3690 = 92E7 5	4040 = 516 1		
3350 = D6D1 9	3700 = BB21 1	4050 = F8A7 4		

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**Product:** Orrery  
**Price:** £95 plus VAT, Site licence  
£150 plus VAT  
**Supplier:** Spacetechn, 21 West  
Wools, Portland, Dorset.  
**Tel:** 0305 822753.  
**Requirements:** BBC A3000 or  
Archimedes range

**A**N ORRERY is one of those marvellous antique brass contraptions with gears and cogs that model the motions of the planets. Orrery from Spacetechn does all that and more on your own computer.

With it you can display the relative positions of the planets against the background stars, look at the orbits and perform a number of exercises and experiments. All this is done from within a multi-tasking environment.

Imagine being able to watch the animated display of the lobster quadrille continually performed by the planets, and witness conjunctions, oppositions and eclipses without the danger of a cloudy night. Well, all this is on offer from Orrery.

This is a complex program with many aspects, and what you get out of it to some extent will be determined by what you put in.

It can illustrate most aspects of naked eye astronomy with the added advantage of being able to speed up time and whisk you round the world all at a touch on a mouse.

For example I particularly liked the observer window which pops up and shows a cross hair on a scrollable map of the world.

You can drag the cross hair with the mouse and the latitude and longitude move to match. So you can be watching the sunrise over Scary in one window and nip across the country and watch it again over Blackpool.

The main observation window allows you to select a number of viewpoints, both geocentric (somewhere on earth) and heliocentric (somewhere in space).

You can choose whether to have each planet displayed and a line indicating their orbits. These lines can be selected to fade as the planet passes, giving an impression of the general direction of movement without the feeling it is moving round a solid line.

You can choose a planet to lock on to for the heliocentric display, it then stays still and the other planets move around it.

The planets can be indicated by letters or icons which are actually

scanned images of the planets. However, there is not as much detail as you might first expect. Their size is also adjustable.

The current time can be set and there is a very nice control panel to allow you to adjust the speed of animation and the direction in which the main observation window is looking.

One very useful option is the full screen. This removes all the distracting window scroll bars and bits of DeskTop and allows the stars with their subtle magnitude differences to be seen at their best.

Once you have a good view you can save the model setup so that you can easily recreate it. You can also save individual pictures in sprite or draw formats.

In the geocentric view you have options to compensate for atmospheric distortion, add an artificial horizon and superimpose a right ascension and declination grid over the sky. This means you can watch a planet rise and see it while it is still below your horizon.

Another very good aspect of this application is that if you want to know what a particular dot of light is on the screen you simply have to click on it.

After a short time a window opens up giving information. It can be a description of a planet complete with picture, or the star's name or designation, magnitude and a mini diagram of the constellation.

This makes identification very easy. If you like you can superimpose the constellation lines on the whole sky.

Given something as vast as the whole solar system to explore it is not always obvious to a beginner what to look for. Therefore I was pleased to see some saved Orrery models illustrating interesting phenomena.

For example, retrograde motion is where a planet appears to be going backwards. It's not of course - it's just that the observer is going faster and catching it up.

The exercises are stored as a text file making it easy for teachers to make up their own worksheets. Not only will these increase your understanding of astronomical events they will also develop your control of the program.

They range in complexity from the simple: *Use Orrery to count how many planets there are in the solar system*, to the complex: *Use Orrery to find out what time of date the solar eclipse of January 16th 1991 in Australia occurred*.

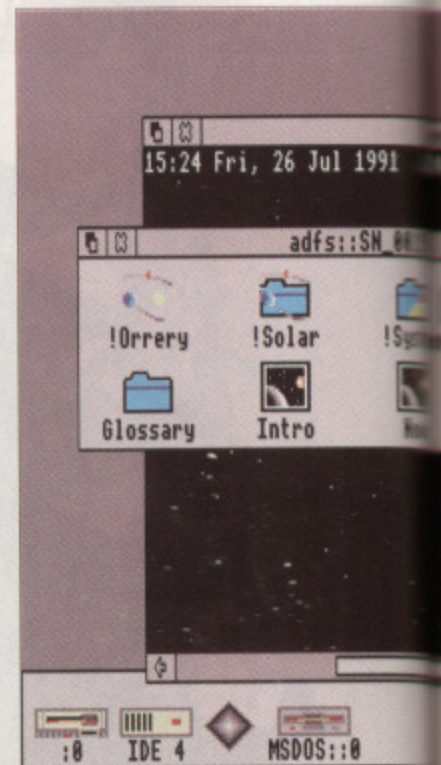
Model answers are also provided for most of these to check your

results. As a final little bonus there is a window with a scale drawing of the solar system. Of course the planet diameters and distances are on a different scale, otherwise you wouldn't be able to see anything. With this you can realise what a long scroll it is out to Pluto.

My only criticism of the program as a whole was the slow action of the menus, which illustrated the large number of calculations being performed and did call for patience while adjusting settings.

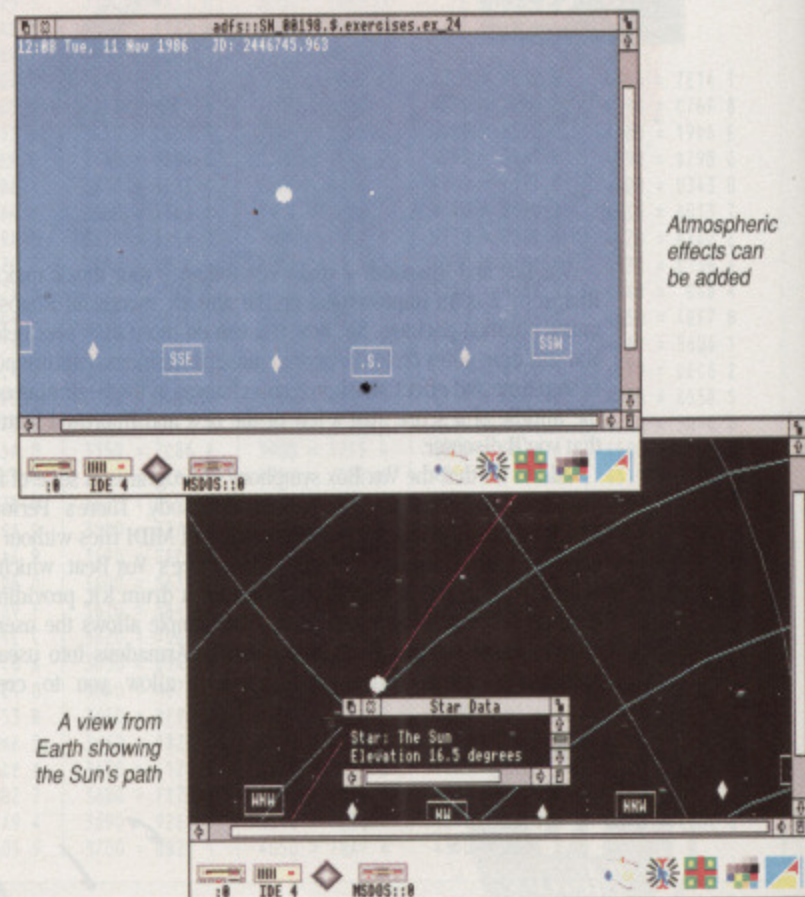
## Summing up

Now on cloudy nights the splendours of the heavens are available to you on your own computer. This sort of program helps to give you a feel for what's going on out there and shows you the ever-changing patterns in the sky. It's definitely worth examination.



Contents of the Orrery disc and Jupiter

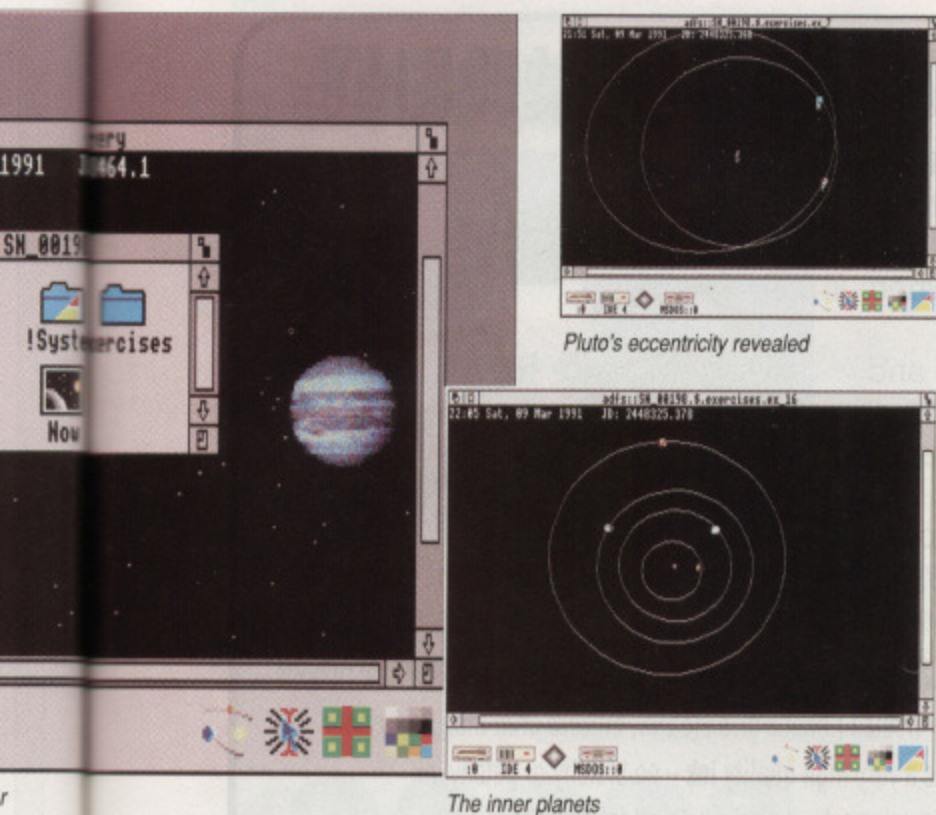
# Star



Atmospheric effects can be added

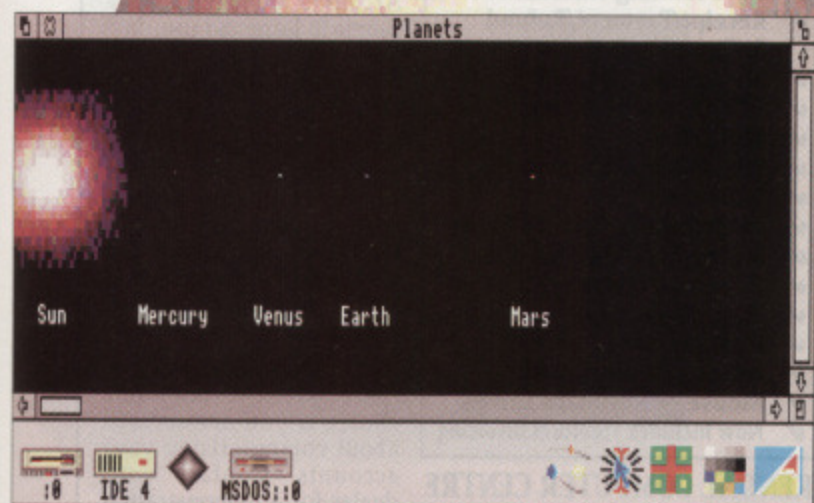
A view from Earth showing the Sun's path





# gazing

Mike Cook looks at an astronomically illuminating piece of software



Planets not too scale



Earth



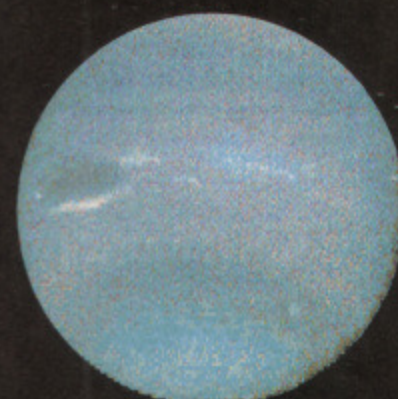
Jupiter



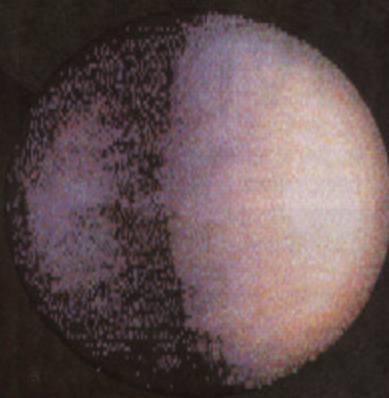
Mars



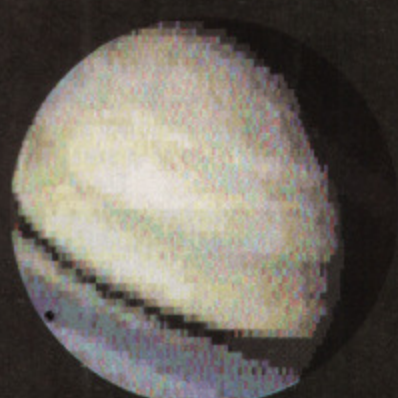
Mercury



Neptune



Pluto



Saturn



Uranus



Venus

## The Planet Sprites

Each planetary image has been scanned from an enhanced colour picture. They can be viewed with or without the orbital paths or not seen at all.



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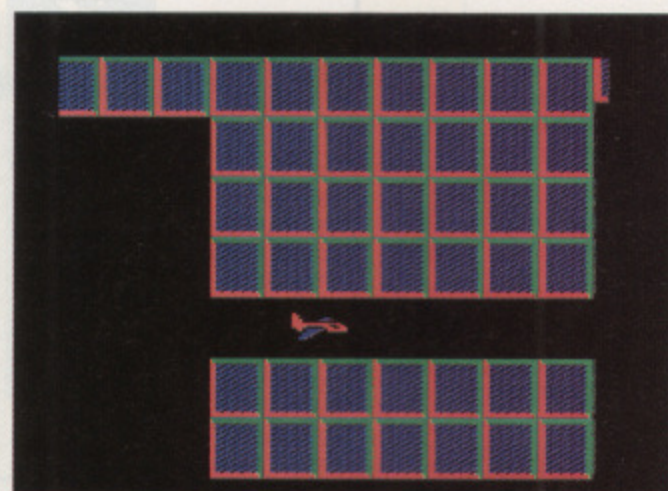
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Hardware scrolling

# The hard way...

*Paul Bedworth rounds off his guide to super-slick scrolling*

**I**N the July issue we saw how a program could software scroll a matrix of sprites. This month's program achieves the same thing, but uses the CRTC chip to do all the work.

The 6845 CRTC controls the output from the computer to the television or monitor screen. It decides what to put on the screen by the data held in the screen memory.

We can achieve scrolling by changing the start of the screen memory as recognised by this chip – you can think of it as moving the screen around the memory.

I'm not going to go into great detail as to how to accomplish it, but it is simply a matter of altering registers 12 and 13 belonging to the CRTC.

One point needs clarifying: The address of the screen start is changed, starting at the lowest point in memory, let's say &3000. This is slowly incremented and eventually reaches &3240 which is that start of the next line.

This wraparound gives the effect of the screen appearing one row higher up the screen. Luckily for us this doesn't matter, as we can carry out the screen update on that area, completely erasing the line with the new column of sprite data. If you did want a display that

wrapped around you would have to write a routine to knock out this line and copy another part of the screen into the gap.

As you can see, the general format of the data in this month's listing is identical to the previous one, apart from the default map width being larger. Because hardware scrolling shifts the whole screen, there is no need to compromise size for speed.

The scroll is significantly slowed down by the:

```
LDA #19:JSR 05BYTE
```

in the *deletesprites* procedure. Try removing this, and you will get super-fast scrolling. The only reason it is there is to make sure that the demonstration routine sprites don't flicker.

Again the demonstration routine is a miniature game featuring yet another spacecraft for you to control. This is harder to get right, however, because the foreground sprite has to be moved against the hardware scroll just to stay still.

● So that's it on scrolling. With these methods under your belt you too could write sideways scrolling shoot-'em-ups to your heart's content.





# Reader Offers

```
10 REM Hardware Scroller
20 REM by Paul Bedworth
30 REM (c) The Micro User
40 :
50 cheat=888
60 ?cheat=FALSE
70 :
80 *FX12,4
90 MapDepth=7
100 SprWidth=4
110 SprDepth=32
120 IncNr=&140*(SprDepth/8)
130 osbyte=&FFF4
140 oswrch=&FFEE
150 data=&70:addr=&72:m=&74:a=
&76
160 :
170 FOR P=0 TO 2 STEP 2
180 PX=&1100
190 [OPT P
200 JMP scroll
210 .xydata
220 OPT FNXydata
230 .calc LDY y:LDA xydata,Y
240 STA a:LDA xydata+32,Y
250 STA a+1
260 LDA x:BEQ endit:TAY
270 .cl LDA a:CLC:ADC #8:STA a
280 LDA a+1:ADC #0:STA a+1
290 DEY:BNE cl
300 .endit
310 RTS
320 .splot \ plot sprite
330 LDA addr
340 PHA
350 STA tcaddr
360 LDA addr+1
370 PHA
380 STA tcaddr+1
390 LDY cols:DEY:BEQ l1
400 .gcl LDA data:CLC
410 ADC #SprDepth:STA data
420 LDA data+1:ADC #0:STA dat
a+1
430 DEY:BNE gcl
440 .l1
450 LDY #0
460 LDX #4
470 .l2
480 LDA (data),Y \ This is no
t
490 STA (addr),Y \ bad progra
mming!
500 INY \ Makes it f
aster
510 LDA (data),Y
520 STA (addr),Y
530 INY
540 LDA (data),Y
550 STA (addr),Y
560 INY
570 LDA (data),Y
580 STA (addr),Y
590 INY
600 LDA (data),Y
610 STA (addr),Y
620 INY
630 LDA (data),Y
640 STA (addr),Y
650 INY
660 LDA (data),Y
```

```
670 STA (addr),Y
680 INY
690 LDA (data),Y
700 STA (addr),Y
710 INY
720 LDA addr
730 CLC
740 ADC #838
750 STA addr
760 LDA addr+1
770 ADC #1
780 STA addr+1
790 DEX
800 BNE l2
810 PLA
820 STA addr+1
830 PLA
840 STA addr
850 RTS
860 .eorsplot
870 LDA a
880 PHA
890 STA tcaddr
900 LDA a+1
910 PHA
920 STA tcaddr+1
930 .el1
940 LDY #0
950 LDX #4:STX cd
960 .eel2 LDX #8
970 .el2
980 LDA (data),Y:BEQ black
990 PHA:LDA (a),Y:BEQ nohit
1000 LDA col:BEQ nohit
1010 LDA cheat:BNE nohit
1020 JSR dead:JMP scroll
1030 .nohit
1040 PLA
1050 .black
1060 EOR (a),Y:STA (a),Y:INY
1070 DEX:BNE el2
1080 LDA a:CLC:ADC #838:STA a
1090 LDA a+1:ADC #1:STA a+1
1100 DEC cd
1110 BNE eel2
1120 LDA data
1130 CLC:ADC #SprDepth:STA dat
a
1140 LDA data+1:ADC #0:STA dat
a+1
1150 LDA tcaddr:ADC #8:STA a
1160 STA tcaddr
1170 LDA tcaddr+1:ADC #0:STA t
caddr+1
1180 STA a+1
1190 DEC cols
1200 BNE el1
1210 PLA:STA a+1
1220 PLA:STA a:RTS
1230 :
1240 .vdudata
1250 OPT FNequd(0)
1260 OPT FNequw(0)
1270 OPT FNequd(4)
1280 OPT FNequd(2)
1290 OPT FNequd(19)
1300 OPT FNequd(0)
1310 OPT FNequd(0)
```

```
1320 OPT FNequw(0)
1330 OPT FNequd(28)
1340 OPT FNequd(6)
1350 OPT FNequd(0)
1360 OPT FNequd(23)
1370 OPT FNequd(0)
1380 OPT FNequw(0)
1390 OPT FNequd(2)
1400 OPT FNequd(3)
1410 OPT FNequd(19)
1420 OPT FNequd(0)
1430 OPT FNequw(0)
1440 OPT FNequd(30)
1450 OPT FNequd(7)
1460 OPT FNequd(0)
1470 OPT FNequd(23)
1480 OPT FNequd(5)
1490 OPT FNequd(22)
1500
1510 .scroll
1520 LDX #43
1530 .vdul
```

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```
1540 LDA vdudata,X
1550 JSR oswrch
1560 DEX
1570 BNE vdul
1580 LDA #19:JSR osbyte
1590 LDA #800:STA ts
1600 LDA #858:STA ts+1
1610 LDA #838:STA addr
1620 LDA #859:STA addr+1
1630 LDA #map MOD 256:STA m
1640 LDA #map DIV 256:STA m+1
1650 LDA #15:STA x:STA xx
1660 LDA #12:STA y:STA yy
1670 JSR plotsprites
1680 JSR &FFEO
1690 .oospl
1700 LDA #1:STA c
1710 .ospl
1720 JSR left
1730 JSR clearline
1740 LDA #19:JSR osbyte
1750 LDA addr:STA topaddr
1760 LDA addr+1:STA topaddr+1
1770 LDA m:STA oldm:LDA m+1:ST
A oldm+1
1780 LDA #MapDepth:STA d
1790 .spl
1800 LDY #0:LDA (m),Y
1810 CMP #8EA:BNE notendmap
1820 JMP welldone
1830 .notendmap
1840 JSR choose
1850 LDA m:CLC:ADC #1:STA m
1860 LDA m+1:ADC #0:STA m+1
1870 LDA c:STA cols
1880 JSR splot
```

```
1890 LDA addr:CLC:ADC #IncNr M
OD 256
1900 STA addr
1910 LDA addr+1:ADC #IncNr DIV
256
1920 STA addr+1
1930 DEC d
1940 BNE spl
1950 LDA topaddr:STA addr
1960 LDA topaddr+1:STA addr+1
1970 LDA oldm:STA m
1980 LDA oldm+1:STA m+1
1990 INC c
2000 LDA c
2010 CMP #SprWidth+1
2020 BEQ nospl
2030 JMP ospl
2040 .nospl
2050 LDA m:CLC:ADC #MapDepth:S
TA m
2060 LDA m+1:ADC #0:STA m+1
2070 JMP oospl
2080 RTS
2090 .clearline
2100 LDA addr:STA topaddr
2110 LDA addr+1:STA topaddr+1
2120 LDA #MapDepth:STA d
2130 .cll
2140 LDA #32:JSR choose
2150 LDA #1:STA cols
2160 JSR splot
2170 LDA addr:CLC:ADC #IncNr M
OD 256
2180 STA addr
2190 LDA addr+1:ADC #IncNr DIV
256
2200 STA addr+1
2210 DEC d
2220 BNE cll
2230 LDA topaddr:STA addr
2240 LDA topaddr+1:STA addr+1
2250 RTS
2260 .left
2270 CLC:LDA ts:ADC #8:STA ts
2280 BCC sleft
2290 INC ts+1
2300 .sleft
2310 LDA ts:CLC:ADC #8138 MOD
256
2320 STA addr
2330 LDA ts+1:ADC #8138 DIV 25
6
2340 STA addr+1
2350 .doscroll
2360 LDA ts+1:BPL check1
2370 SEC:SBC #850:STA ts+1
2380 .check1
2390 CMP #830
2400 BPL update
2410 CLC:ADC #850:STA ts+1
2420 .update
2430 JSR deletesprites
2440 LDA ts+1:STA tempA
2450 LDA #13:STA &FE00
2460 LDA ts:LSR tempA:ROR A
2470 LSR tempA:ROR A:LSR tempA
:ROR A
2480 STA &FE01
2490 LDA #12:STA &FE00
2500 LDA tempA:STA &FE01
2510 JSR plotsprites
2520 RTS
2530 .deletesprites
```



## Poster

An object-based DTP package which allows you to do far more than create posters. In fact there isn't much in the way of DTP design and layout that can't be done with Poster. It's almost an art package. The application is fully RISC OS compliant, so can 'talk' to Edit, Draw and any other RISC OS program. Poster comes with its own set of unusual outline fonts but will allow you to use any RISC OS outline fonts. It also has a huge collection of interesting borders and clip art. Two features place

Poster in a different league from other packages. Firstly, you can do wonderful things with text. It can be made to flow along any path or it can be moulded into virtually any shape (as can outline Draw files). Secondly, the size of your document is not dependent upon the limitations of your printer. Poster will allow a document of any size to be created (although 100 metres square is not very practical). It then prints the document in sections which can be cut and assembled using the trim marks. Poster documents may be used in other DTP packages.

## Snippet

A utility which will make you wonder how you ever managed without it. Snippet will allow you to print or save any part of any screen. It will even cope with most programs running under the 65Host BBC Emulator. But Snippet will allow you to do lots more. Sprites may be converted from one mode to another and even 8 bit BBC screens may be easily converted into Archimedes sprites. A vast array of tools allows you to trim sprites, add borders, change colours, use outline fonts to add text, edit pixels, rotate sections and combine any number of sprites to make a single sprite. A carousel allows sprites to be displayed.



## ALSO...

**JIGSAW** — allows sprites of any size to be converted into jigsaws with real jigsaw-shaped pieces. It comes complete with a set of pictures including some by the well-known artist Rodney Matthews.

**JIGLET** — the version for younger users. It has fewer pieces and a more appropriate set of pictures.

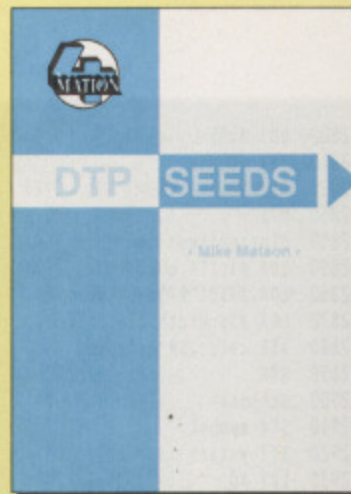
**CRAFTSHOP 1 and CRAFTSHOP 2** — programs allowing those with limited artistic ability to create some stunning results. Both packages are currently in use in thousands of schools and homes.



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CREATED WITH POSTER

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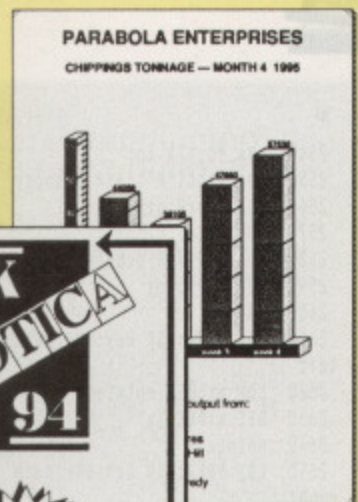
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UTILITY

```

2540 LDA #0:STA col
2550 LDA #ASC("P"):JSR schoose
2560 LDA #SprWidth:STA cols
2570 JSR calc
2580 LDA #19:JSR osbyte
2590 JSR eorsplot
2600 INC x
2610 LDX #&9E:JSR key:BNE notm
left
2620 LDA xx:BEQ notmleft
2630 DEC x:DEC xx
2640 .notmleft
2650 LDX #&BD:JSR key:BNE notm
right
2660 LDA xx:CMP #35:BEQ notmri
ght
2670 INC x:INC xx
2680 .notmright
2690 LDX #&97:JSR key:BNE notm
down
2700 LDA yy:CMP #24:BEQ notmdo
wn
2710 INC y:INC yy
2720 .notmdown
2730 LDX #&B7:JSR key:BNE notm
up
2740 LDA yy:BEQ notmup
2750 DEC y:DEC yy
2760 .notmup
2770 RTS
2780 .key
*2790 LDA #129

2800 LDY #255
2810 JSR osbyte
2820 CPY #255
2830 RTS
2840 .plotsprites
2850 LDA #1:STA col
2860 LDA #ASC("P"):JSR schoose
2870 LDA #SprWidth:STA cols
2880 JSR calc:JSR eorsplot
2890 RTS
2900 .schoose
2910 STA symbol
2920 STY ystore
2930 LDY #0
2940 .searchl
2950 LDA sptable,Y
2960 BEQ notfound
2970 CMP symbol
2980 BEQ foundit
2990 INY:INY:INY
3000 JMP searchl
3010 .foundit
3020 LDA sptable+1,Y
3030 STA data
3040 LDA sptable+2,Y
3050 STA data+1
3060 LDY ystore
3070 RTS
3080 .notfound
3090 LDA sptable+1
3100 STA data
3110 LDA sptable+2
3120 STA data+1

3130 LDY ystore
3140 RTS
3150 .dead
3160 LDY #255
3170 .vl LDX #3
3180 .v19l
3190 CPX #2:BEQ notgreen
3200 LDA #19:JSR oswrch
3210 LDA #0:JSR oswrch
3220 TXA:JSR oswrch
3230 LDA #0:JSR oswrch
3240 JSR oswrch:JSR oswrch
3250 .notgreen
3260 DEX
3270 BNE v19l
3280 DEY:BNE vl
3290 .novdus
3300 JSR wait
3310 RTS
3320 .welldone
3330 JSR wait
3340 LDX #0
3350 .msg LDA text,X
3360 JSR oswrch
3370 INX
3380 CMP #0
3390 BNE msg
3400 LDA #21
3410 LDX #0

3420 JMP osbyte
3430 .wait
3440 LDX #255
3450 .w1 LDX #255
3460 .w2 NOP:NOP:NOP
3470 NOP:NOP:NOP
3480 DEX:BNE w2
3490 DEY:BNE w1
3500 RTS
3510 .text
3520 OPT FNequb(22)
3530 OPT FNequb(5)
3540 OPT FNequb(31)
3550 OPT FNequb(2)
3560 OPT FNequb(4)
3570 OPT FNequs("Well Done!")
3580 OPT FNequb(31)
3590 OPT FNequb(2)
3600 OPT FNequb(6)
3610 OPT FNequs("Level 2 Compl
eted!")
3620 BRK:NOP
3630 .map
3640 OPT FNequs("0 ")
3650 OPT FNequs("0 ")
3660 OPT FNequs("0 ")
3670 OPT FNequs("0 ")
3680 OPT FNequs("0 ")
3690 OPT FNequs("0 ")

```

10 = 00	450 = 9CF1 F	890 = 50BB 6	1330 = E6A 1	1770 = 2A8A 2	2210 = 248E C	2650 = F168 7	3090 = 8FE4 1	3530 = 9A2C 0	3970 = 5FF2 5	
20 = 00	460 = AAC1 A	900 = 3F74 B	1340 = CF7F C	1780 = F7D0 1	2220 = 739B A	2660 = 61A7 4	3100 = 8826 1	3540 = 83C2 C	3980 = 4FB9 8	
30 = 00	470 = C591 4	910 = 824E 7	1350 = 65D9 C	1790 = B13F A	2230 = 4E57 2	2670 = 43D5 D	3110 = BF87 2	3550 = 3BB 4	3990 = 4FB9 0	
40 = 9719 9	480 = 71E4 5	920 = 923D D	1360 = D290 1	1800 = E8F0 9	2240 = 501 4	2680 = DAE6 D	3120 = 2AFB A	3560 = A91D C	4000 = 4FB9 C	
50 = 18E8 2	490 = 5047 0	930 = 8DBA 4	1370 = 4240 C	1810 = C8C3 9	2250 = 9843 C	2690 = 65EA A	3130 = 3905 8	3570 = 844B D	4010 = 4FB9 D	
60 = 41B9 5	500 = 97CF 5	940 = 9CF1 E	1380 = C23B 8	1820 = A5D0 0	2260 = 3EF8 7	2700 = 77C 1	3140 = 9843 D	3580 = 83C2 2	4020 = 5A8B 9	
70 = 9719 8	510 = 423D 8	950 = 4137 E	1390 = 3BB 6	1830 = 5C8E 3	2270 = 58D E E	2710 = 2716 B	3150 = 309D 9	3590 = 3BB 5	4030 = 5A8B E	
80 = A992 C	520 = 8D34 0	960 = 1104 4	1400 = 308A 1	1840 = 2D06 0	2280 = 9DCD 3	2720 = BD95 0	3160 = 504E 2	3600 = CF7F F	4040 = 69AA 5	4410 = 11CC 0
90 = CBAD B	530 = 6623 0	970 = BDD9 4	1410 = 640B 8	1850 = AC13 3	2290 = 194B F	2730 = 4005 4	3170 = D975 B	3610 = A798 F	4050 = 5F24 9	4420 = 435 D
100 = 891 3	540 = 423D F	980 = 18B5 E	1420 = 4240 7	1860 = 82C1 5	2300 = BF1B C	2740 = FAA1 E	3180 = 4242 2	3620 = BEA5 0	4060 = 5F24 6	4430 = 1B5D 0
110 = 2401 C	550 = 8D34 7	990 = 7BD7 D	1430 = C23B E	1870 = 8DA2 A	2310 = AF87 3	2750 = 4AD7 2	3190 = F084 E	3630 = AA2 D	4070 = 5F24 3	4440 = DA42 9
120 = AE 1	560 = 6623 D	1000 = 3373 3	1440 = 70B9 5	1880 = 76D0 D	2320 = FEB2 3	2760 = 2765 A	3200 = 3863 5	3640 = CDA B	4080 = 5F24 D	4450 = 73AB 0
130 = 7966 A	570 = 423D B	1010 = E7CF 1	1450 = 44F1 9	1890 = 496F E	2330 = 45F5 C	2770 = 9843 5	3210 = 7D3F 7	3650 = CDA E	4090 = 5F24 E	4460 = FD2E 6
140 = 78 8	580 = 8D34 0	1020 = 5D67 5	1460 = 65D9 7	1900 = FEB2 F	2340 = 4B39 8	2780 = E5EF 1	3220 = E6B8 C	3660 = CDA 5	4100 = 5F24 E	4470 = 9719 3
150 = ECCB D	590 = 6623 B	1030 = 5388 C	1470 = 1F15 4	1910 = 98B9 B	2350 = E8F5 8	2790 = 46C3 0	3230 = 7D3F 5	3670 = CDA 0	4110 = 5F24 8	4480 = 38DB 0
160 = 9719 8	600 = 423D 4	1040 = 4E8A F	1480 = 9A2C E	1920 = 4B39 9	2360 = 98D7 C	2800 = 504E 6	3240 = 8742 1	3680 = CDA E	4120 = 5F24 6	4490 = 26E0 4
170 = 71C1 5	610 = 8D34 F	1050 = D1FB C	1490 = E1A1 4	1930 = 248E 9	2370 = 6286 8	2810 = 8E7E 0	3250 = 65D5 F	3690 = CDA 9	4130 = 50AC 5	4500 = E910 F
180 = E3C5 3	620 = 6623 3	1060 = E368 F	1500 = D1AD D	1940 = 76E6 D	2380 = 79 6	2820 = 7F31 8	3260 = E8A9 7	3700 = 4455 7	4140 = 6EE2 E	4510 = 215F 7
190 = 6C81 3	630 = 423D F	1070 = 2D8D 2	1510 = DB26 2	1950 = 4E57 E	2390 = 8F02 4	2830 = 9843 4	3270 = 32E9 5	3710 = 4455 9	4150 = 4A9D 6	4520 = 889D A
200 = C5FB A	640 = 8D34 7	1080 = CC7D 5	1520 = D39D 9	1960 = 501 1	2400 = F5D8 5	2840 = E2E1 1	3280 = ABCE F	3720 = 4455 7	4160 = 688D 0	4530 = E2A3 6
210 = 2638 B	650 = 6623 C	1090 = 1D4B 9	1530 = BFDD 6	1970 = E1C1 2	2410 = 9B3F 7	2850 = EA52 D	3290 = 64FF 9	3730 = 4455 7	4170 = 366B 1	4540 = 9719 6
220 = BC45 5	660 = 423D 3	1100 = 5F53 D	1540 = F9FF 0	1980 = B081 B	2420 = 8083 2	2860 = 7858 9	3300 = 967B 8	3740 = 4455 6	4180 = 8CBC C	4550 = 1E0E 0
230 = 9E7C 0	670 = 8D34 B	1110 = 7AED D	1550 = 9224 4	1990 = 6B0C 7	2430 = D071 C	2870 = D7AC 8	3310 = 9843 7	3750 = 4455 1	4190 = 4A5 6	4560 = 466A E
240 = 22E6 F	680 = 6623 7	1120 = 5B2B 0	1560 = E8A9 4	2000 = 4E9D 3	2440 = 78F5 0	2880 = AC61 0	3320 = 9F71 F	3760 = 4455 9	4200 = 640C 0	4570 = 6098 B
250 = 9862 3	690 = 423D F	1130 = 6245 7	1570 = CF76 3	2010 = 8E99 A	2450 = 53B3 C	2890 = 9843 1	3330 = 967B 3	3770 = 541E 2	4210 = FE38 E	4580 = CD79 B
260 = 90C 0	700 = 8D34 0	1140 = 56AB 6	1580 = 2439 8	2020 = 3F4D 8	2460 = 8908 3	2900 = 68FC 5	3340 = EA45 9	3780 = 7DBB C	4220 = 4B3D 1	4590 = E2A3 8
270 = 70F1 0	710 = 6623 3	1150 = 8526 8	1590 = 871F 1	2030 = 817D 6	2470 = A13D 3	2910 = 599 0	3350 = A384 8	3790 = 3BA1 D	4230 = 36F9 9	4600 = 9719 5
280 = F668 8	720 = 2D8F D	1160 = 5DBB 4	1600 = 5EFA 5	2040 = CAC8 5	2480 = EC61 C	2920 = A8D C	3360 = 9224 4	3800 = 7DBB D	4240 = 7FA5 0	4610 = DF89 C
290 = 5748 C	730 = 74FB 3	1170 = 92FD 7	1610 = AB4A 9	2050 = 3311 B	2490 = 8BFA F	2930 = 9CF1 D	3370 = 76D2 2	3810 = 4FB9 A	4250 = 70CE D	4620 = 6701 C
300 = BCA2 7	740 = 7E04 0	1180 = 9862 3	1620 = 587A 0	2060 = 82C1 2	2500 = 9F35 6	2940 = 5481 D	3380 = 2F9 A	3820 = 4FB9 B	4260 = 483 4	4630 = 84A7 F
310 = 9843 6	750 = FEB2 2	1190 = 8455 3	1630 = D10B 8	2070 = 1A58 4	2510 = 14AB D	2950 = FBDD B	3390 = CABCF	3830 = 5BA8 5	4270 = 313D 9	4640 = 754B 1
320 = 2DDB A	760 = DAE0 B	1200 = 4A63 F	1640 = E1D5 B	2080 = 9843 E	2520 = 9843 D	2960 = 3FB9 5	3400 = F552 F	3840 = 5BA8 C	4280 = 6594 4	4650 = 2249 0
330 = 2D8F 4	770 = B19F 6	1210 = 7FB4 D	1650 = F0F 2	2090 = C7AB 3	2530 = 8098 F	2970 = 7A4A D	3410 = EA45 6	3850 = 4576 E	4290 = 8E38 5	4660 = 9719 F
340 = 824E B	780 = 4B39 1	1220 = F8FD C	1660 = 1BCA 7	2100 = 1C3D 4	2540 = 171 4	2980 = 4D17 2	3420 = 2151 9	3860 = 4576 B	4300 = 5D7 D	4670 = E4D6 D
350 = 5DDB 8	790 = E8A9 F	1230 = 9719 D	1670 = 14AB C	2110 = 56EA F	2550 = 7858 E	2990 = EF1B A	3430 = F7BE 4	3870 = 5A8B C	4310 = 1D8E 1	4680 = 9872 0
360 = DAE0 7	800 = 33D9 1	1240 = 2037 7	1680 = EB7F E	2120 = F7D0 D	2560 = D7AC 4	3000 = 7A7E 8	3440 = 15EE 6	3880 = 5044 8	4320 = C0AF 9	4690 = 517A C
370 = 824E 3	810 = 4E8A 2	1250 = 4240 E	1690 = 6099 3	2130 = B44D 0	2570 = DA0E C	3010 = 600E 4	3450 = 9CD5 D	3890 = 7DBB C	4330 = 4C3E 7	4700 = 915A A
380 = 923D 1	820 = 4B39 1	1260 = C23B D	1700 = AB66 D	2140 = 4C9B 4	2580 = 2439 B	3020 = 3E5B 1	3460 = B2E 5	3900 = 7DBB 7	4340 = 6721 8	4710 = 9719 2
390 = 2836 1	830 = 4E8A 4	1270 = A91D 9	1710 = 6E0B F	2150 = 409D F	2590 = 7EEF 2	3030 = 8826 1	3470 = B82F 0	3910 = 7DBB E	4350 = F5D 6	4720 = 9E0D E
400 = 8FB9 6	840 = FEB2 1	1280 = 3BB 7	1720 = 5F3D D	2160 = 76D0 3	2600 = C85D 0	3040 = 670B 4	3480 = 6417 B	3920 = 4FB9 3	4360 = 133A F	4730 = E90F 9
410 = A552 1	850 = 9843 4	1290 = 640B 1	1730 = 7BC7 7	2170 = 496F B	2610 = 7D0D A	3050 = 2AFB 7	3490 = 13A7 B	3930 = 4FB9 D	4370 = 9436 8	4740 = F9D 4
420 = 56AB 9	860 = 9C8E 3	1300 = 65D9 F	1740 = 2439 E	2180 = FEB2 A	2620 = 538D 4	3060 = 3905 C	3500 = 65B3 C	3940 = 5FF2 8	4380 = B5CE 0	4750 = F1F5 7
430 = 3C6 F	870 = 6ED2 8	1310 = 424D 6	1750 = 1C3D 9	2190 = 9B9B 1	2630 = 2E14 2	3070 = 9843 A	3510 = 80E0 7	3950 = 5FF2 1	4390 = 65D9 B	4760 = 75EE 4
440 = F5F2 7	880 = 824E 8	1320 = C23B 5	1760 = 56EA E	2200 = 4B39 2	2640 = 7CAE 8	3080 = D376 2	3520 = E1A1 0	3960 = 5FF2 9	4400 = 78FE 0	4770 = E531 6







```

3700 OPT FNequs("0000 00")
3710 OPT FNequs("0000 00")
3720 OPT FNequs("0000 00")
3730 OPT FNequs("0000 00")
3740 OPT FNequs("0000 00")
3750 OPT FNequs("0000 00")
3760 OPT FNequs("0000 00")
3770 OPT FNequs("0 00")
3780 OPT FNequs("0 0000")
3790 OPT FNequs("0 0 ")
3800 OPT FNequs("0 00000")
3810 OPT FNequs("0 0")
3820 OPT FNequs("0 0")
3830 OPT FNequs("00000 0")
3840 OPT FNequs("00000 0")
3850 OPT FNequs("000 0")
3860 OPT FNequs("000 0")
3870 OPT FNequs("000 000")
3880 OPT FNequs("0 000")
3890 OPT FNequs("0 00000")
3900 OPT FNequs("0 00000")
3910 OPT FNequs("0 00000")
3920 OPT FNequs("0 0")
3930 OPT FNequs("0 0")
3940 OPT FNequs("0000 0")
3950 OPT FNequs("0000 0")
3960 OPT FNequs("0000 0")
3970 OPT FNequs("0000 0")
3980 OPT FNequs("0 0")
3990 OPT FNequs("0 0")
4000 OPT FNequs("0 0")
4010 OPT FNequs("0 0")
4020 OPT FNequs("000 000")
4030 OPT FNequs("000 000")

```

```

4040 OPT FNequs("00 00")
4050 OPT FNequs(" ")
4060 OPT FNequs(" ")
4070 OPT FNequs(" ")
4080 OPT FNequs(" ")
4090 OPT FNequs(" ")
4100 OPT FNequs(" ")
4110 OPT FNequs(" ")
4120 OPT FNequs(" ")
4130 NOP:NOP
4140 .tcaddr OPT FNequw(0)
4150 .cols OPT FNequb(0)
4160 .symbol OPT FNequb(0)
4170 .ystore OPT FNequb(0)
4180 .c OPT FNequb(0)
4190 .d OPT FNequb(0)
4200 .topaddr OPT FNequw(0)
4210 .oldm OPT FNequw(0)
4220 .ts OPT FNequw(0)
4230 .tempa OPT FNequb(0)
4240 .ends OPT FNequw(0)
4250 .tca OPT FNequw(0)
4260 .x OPT FNequb(0)
4270 .y OPT FNequb(0)
4280 .xx OPT FNequb(0)
4290 .yy OPT FNequb(0)
4300 .cd OPT FNequw(0)
4310 .col OPT FNequb(0)
4320 .sptable
4330 OPT FNequs(" ")
4340 OPT FNequw(blankdata)
4350 OPT FNequs("0")
4360 OPT FNequw(blockdata)
4370 OPT FNequs("P")

```

```

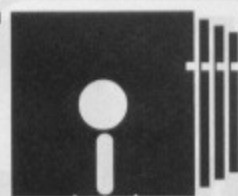
4380 OPT FNequw(blockdata+4*32
)
4390 OPT FNequb(0)
4400 .blockdata
4410 OPT FNsdata
4420 .blankdata
4430 OPT FNequs(STRING$(4*32,C
HR$(0)))
4440 J:NEXT
4450 PROCexecute
4460 END
4470 :
4480 DEFFNsdata
4490 RESTORE 4610
4500 FOR IX=1 TO ((SprWidth*Spr
Depth)/4)*2
4510 READ d$
4520 [OPT P:OPT FNequd(EVAL("&
+d$))
4530 J:NEXT:=P
4540 :
4550 DEFFNxdata
4560 RESTORE 4640
4570 FOR IX=1 TO 64:READ d
4580 [OPT P:OPT FNequb(d)
4590 J:NEXT:=P
4600 :
4610 DATA 3c7f7fff,2c3c1c2c,1c2
c3c1c,3c1c2c3c,2c3c1c2c,1c2c3c1c
,3c1c2c3c,f0f0f2c,60ffffff,0d60b
0d0,0d0d0d0d,60b0d0d0,0d0d0d0d,b
0d0d0d0,60b0d0d0,f0f0f0d,0dfffff
f,0d0d0d0d,60b0d0d0,0d0d0d0d,0d0
0d0d,60b0d0d0,0d0d0d0d,f0f0f0d,

```

```

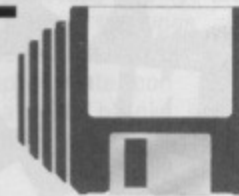
B3ffffff
4620 DATA73b3f373,f373b3f3,b3f3
73b3,73b3f373,f373b3f3,b3f373b3,
1f1f3f73,0
4630 DATA 0,e0c0c0b,f0f0f0e,101
00206,3030,0,0,0,0,f0f00,c0e0f
0f0,80,0,0,0,0,e060000,70e0f00,
383,0,0,0,0,0,3060c00,f0f,0,0,
0,0
4640 DATA 0,64,128,192,0,64,128
,192,0,64,128,192,0,64,128,192,0
,64,128,192,0,64,128,192,0,64,12
8,192,0,64,128,192
4650 DATA 88,89,90,91,93,94,95,
96,98,99,100,101,103,104,105,106
,108,109,110,111,113,114,115,116
,118,119,120,121,123,124,125,126
4660 :
4670 DEFFNequs(s$)$P$=s$:P$=P$+
LENs$:=P
4680 DEFFNequb(B$)?P$=B$:P$=P$+
1:=P
4690 DEFFNequw(W$)!P$=W$:P$=P$+
2:=P
4700 DEFFNequd(D$)!P$=D$:P$=P$+
4:=P
4710 :
4720 DEFPROCexecute
4730 s$="CALL scroll"+CHR$(13)
4740 FOR L=1 TO LEN(s$)
4750 XX=0:YY=ASCID$(s$,L)
4760 AX=138:CALL osbyte
4770 NEXT:ENDPROC

```



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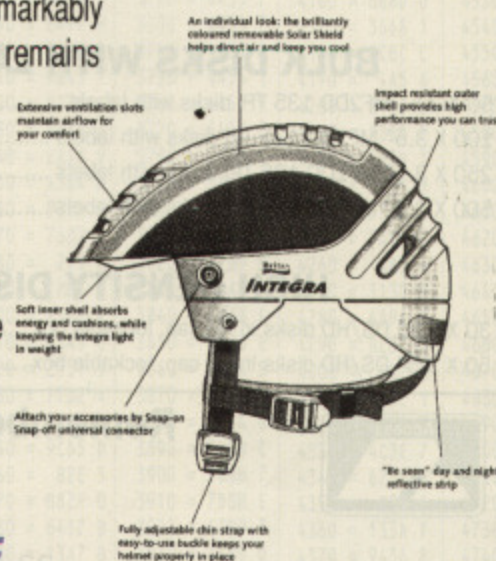


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**K**EEPING a hard disc in order isn't easy. The root directory contains, as far as possible, just the main sub-directories, with applications contained in a directory called Apps. In addition, members of the family have their own one for personal use.

All your own work, as well as word-processor and other files, are contained within your personal directory, which can be organised how you wish, without interference from anyone else – hopefully.

The problem with this arrangement is that if I access the root directory of the hard disc and proceed straight to my own directory, the machine knows nothing of the applications in the Apps directory.

It does not know, for instance, what to do with a Draw or a Pipedream file. It can only represent them by a plain white square, instead of their correct sprite, and any attempt to double-click on them would produce a No Run action for this type of file error message.

The answer to this problem is to find a way of making Risc OS aware of these applications without actually putting them in the root directory, where they could make the main sub-

if you do not access the hard disc. I use my !Boot file for other purposes, so I have adopted a different method.

The second approach consists of a very simple application called !BootUp, which contains only the two Obey files, named !Boot and !Run, together with an optional sprite file. This is the only application which resides in the root directory.

When the root directory viewer is opened, Risc OS sees that an application directory is present and checks to see if it contains a file called !Boot.

If it finds one, it runs it. We can therefore use !Boot, within the !Bootup application, to contain the instructions to make Risc OS aware of those applications which we use most often.

The rest are contained in the !Run file, and to start them you just double-click on the !Bootup icon.

Apart from !System, the chosen applications are those with their own file types, which might be found in other directories on the hard disc.

To produce this application, you first need to create a new directory called !Bootup, located in the root directory. This directory will be rep-

resented in the root directory window by a standard application icon, unless you give it a !Sprites file.

You will have to write your own !Boot and !Run Obey files, using !Edit, since their contents will depend on your personal preference and the way in which you organise your hard disc. My own are given here as an example:

```
!Boot file for !Bootup
IconSprites <Obey$Dir>.!Sprites
Set Boot$dir <obey$dir>
<Boot$dir>.^..Apps.!System.!Boot
<Boot$dir>.^..Apps.!Edit.!Boot
<Boot$dir>.^..Apps.!Draw.!Boot
<Boot$dir>.^..Apps.!Paint.!Boot
<Boot$dir>.^..Apps.!Pipedream.!Boot
<Boot$dir>.^..Apps.!Impress.!Boot
```

The second line should be deleted if you do not give the application a !Sprites file. For my sprite, I drew a representation of a Wellington boot, using !Paint.

Make the sprite 34 x 17 pixels, with mask on, give it the sprite name !Bootup, and save it in the !Bootup directory with the filename !Sprites.

By using the Boot\$Dir system variable in the pathname of each of

the applications you don't have to worry what filing system you're using as this is automatically supplied.

Unfortunately Boot\$dir also includes the !Bootup name, but by using the up arrow we can move back up to the root directory.

The most important application to boot up is, of course, !System. Some people also prefer to have !Fonts in the root directory as well, so you could add a line for this if you need to but you can use a different method, more of which later.

!Draw and !Paint are included so that all the basic file types are handled.

Less frequently used applications like !Maestro and !Formed are relegated to the !Run file, which has exactly the same structure – but without the IconSprites command – so isn't repeated here.

The thing to remember is that none of these applications is actually loaded – ram in a 1 Mbyte machine is far too precious to be cluttered up with large applications that you are not using, particularly if you are desktop publishing.

All that happens is that certain system variables are set which tell the system what to do when particular file types are double-clicked and where to find the application in question.

The necessary sprites are loaded so that these file types can be represented by the appropriate icon instead of a blank square.

# Order of the boot

directories harder to find quickly.

This can be done by using an Obey file to run the !Boot files of the chosen applications. As it can take an annoying few seconds to run all the !Boot files and load all the application sprites, even with a hard disc, I prefer to use two Obey files.

One runs automatically to handle applications which I use often, and the second, which must be double-clicked on, deals with the remainder.

The first of these Obey files could be the !Boot file in the hard disc root directory, which is run either by pressing Shift+Break or automatically by setting the auto-boot option with the command:

\*Configure Boot

and resetting the machine. The second Obey file could be located in the root directory.

This approach assumes that you want your first Obey file to run whenever you start up the machine, even

*Help yourself and your hard disc  
with tidy-minded Martyn Fox*





## Using fonts

The !Fonts application occupies some 57k when it's been run, so it would be nice if programs that require fonts should load them only when needed and not before.

You might have !Fonts tucked away in a directory called Printing also contains various printer odds and ends. So add an extra line to the !Boot file of !Bootup:

```
Set Font$Patch
<Boot$dir>^.Printing.!Fonts
```

This line creates a system variable called *Font\$Patch* which can be used to tell various applications where the fonts are. It is then necessary to edit the application's !Run file. Needless to say, this should only be done on the hard disc, not on your master floppy or backup copy of it.

Great care is needed here. An application such as Impression may have a long and complicated !Run

file which makes several references to a system variable called *Obey\$Dir*.

This variable is automatically set each time the filing system runs an Obey file, such as a !Boot or !Run file, and it contains the pathname of the directory containing the file.

We are going to modify a !Run file so that it includes a command to run another Obey file, namely the !Boot file in !Fonts. This will change *Obey\$Dir* as we do it, so that its contents will be different during the remainder of the !Run file.

For this reason we need to make some slight changes to the !Run file of Impression, or whatever application is going to use the fonts. Load the file into !Edit and examine it. Somewhere there will be a line such as:

```
Set Impression$Dir <Obey$Dir>
```

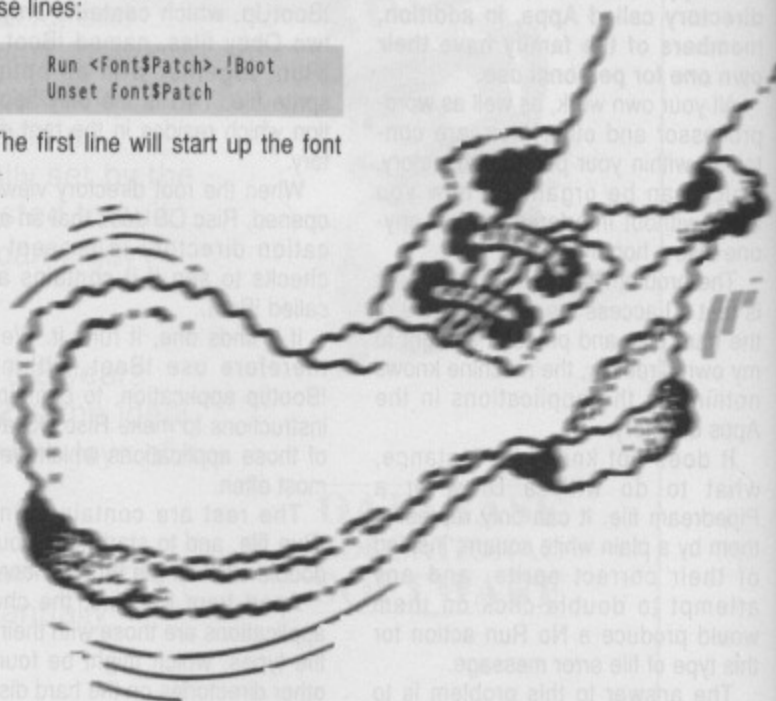
Move this line to the start of the file, then check for any other lines that contain *<Obey\$Dir>*. If you find any, replace *<Obey\$Dir>* with *<Impression\$Dir>*, or the variable for whatever application you are working on. It is now safe to do

something that will change the contents of *Obey\$Dir* after the first line, as it does not appear again in the !Run file after that.

After the line which you moved up to the beginning of the file, insert these lines:

```
Run <Font$Patch>.!Boot
Unset Font$Patch
```

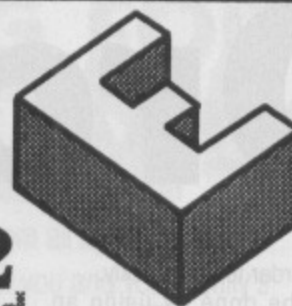
The first line will start up the font



# Ace Computing

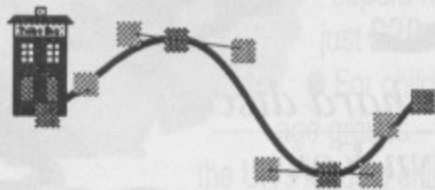


## E<sup>in</sup>=M<sup>ulti</sup>C<sup>2</sup><sub>ad</sub>



Coming soon from the makers of *Euclid*, *Mogul*, *Splice*, *Tween* and *ArcLight*, is an addition to the range.

*Einstein* is a new tool for editing Space-Time, which provides a consistent approach to editing in 2, 3, 4 or even more dimensions.



"Any discussion of design with the Archimedes must include what has virtually become the standard 3D graphics and animation system.

I mean of course the *Euclid/Mogul/Splice* trio of packages from Ace Computing. *Euclid* is a Risc OS compliant, interactive, multi-document, 3D, graphics and animation program which is so easy to get to grips with.

Designs can be put together, rotated in real time, zoomed in and out of and viewed in perspective from any position...

...It is interesting to note that the next set of BBC TV's *Science Challenge* programmes employ *Euclid* graphics."

CHRIS DRAGE Education section  
BBC ACORN USER February 1991



# Ace Computing



**Product:** ARcticate  
**Price:** £24.95  
**Supplier:** The Fourth Dimension,  
 1 Percy Street, Sheffield S3 8AU.  
**Tel:** 0742 700661

**I**n the July issue we reviewed three packages that use the built-in sound system of the Archimedes and BBC A3000 to produce speech, some more comprehensible than the rest. This month we have a late addition to the race in the form of ARcticate from The Fourth Dimension.

The package arrives in the same video-size box as 4D's games and includes a small six page manual and one disc. There's a demo, the main program – IARctiC – an exception dictionary, module library (IShare), joke-telling DeskTop silly and a sound-on-desktop-event generator. There are also applications for four different types of voice, male, female, alien and droid.

The main program can be used to test text to be spoken. You just type in the words and the program speaks up. You can load up one or more of the voices and the selected one will enunciate the text that was typed in. The pitch and speed can be altered.

When you load up one of the voices you get a window containing the face connected to the voice. As the voice speaks, the mouth moves – it's quite effective.

All the other speech packages produce their sounds by literally synthesising the individual phonemes, but with ARcticate the phonemes are digitised and played back in the order they are required. This has two effects, one good and two bad.

The benefit is that there's the option of different voice types, and to add more all that's required is digitising a matching set of phonemes. Particular dialects could be used.

The disadvantage is that reproduction of the phoneme sound is slightly incorrect in places, resulting in strange pronunciation of some words despite using the correct phonemes.

And there is an occasional conflict between phonemes, which can make words break strangely in the middle. Only 42 phonemes are available and these really aren't sufficient to cope with all situations.

The dictionary program allows you to edit the existing list of exceptions. This works well and is certainly easier to use than Superior Software's ISpeech. However, it should be remembered that in the latter program the entirety of the pronunciation is controlled from the exception dictio-

nary as well. The programming interface described in the manual has 12 command line instructions and a list of 11 SWIs – in fact there's another one mentioned in the next paragraph – but no description of registers is used. An experienced programmer would be able to work it out.

On disc the only additional documentation is a ReadMe file within the IShare directory that details how to get around the protection scheme. Another SWI needs to be issued – *Speech\_Protect* – which requests the insertion of the original disc.

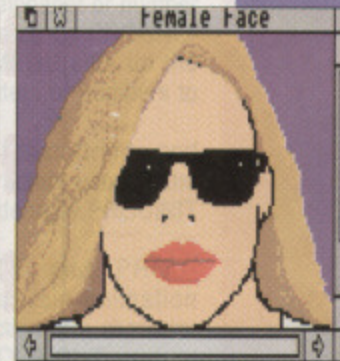
As mentioned, the sound quality has both good and bad points. The sampled phonemes sound good most of the time but lapse into complete incomprehensibility when certain combinations are used. The option of four different voices is clever and would theoretically permit further extension,

but four seems to be hard-wired into the main program.

One minor niggle is that the DeskTop interface is not entirely standard. When Menu is clicked over the iconbar icon the Quit option that appears is labelled Exit and the menu doesn't appear in quite the right place. I find this aggravating, not least because it's unnecessary.

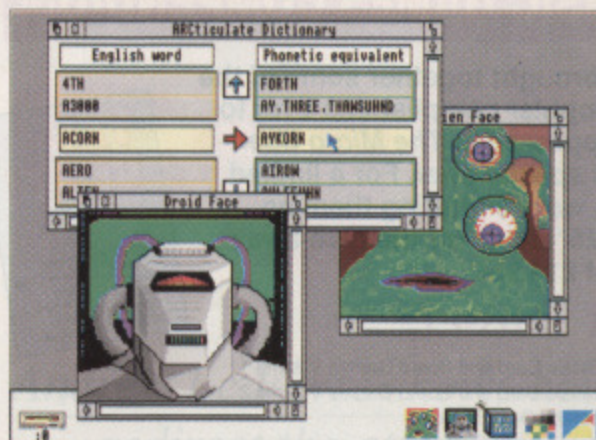
## Summing up

On the whole this is a good system but it fails to come up to scratch. It's certainly better than DT-Talk and SpeechSystem, but falls some way behind ISpeech. The spartan documentation could certainly be improved.

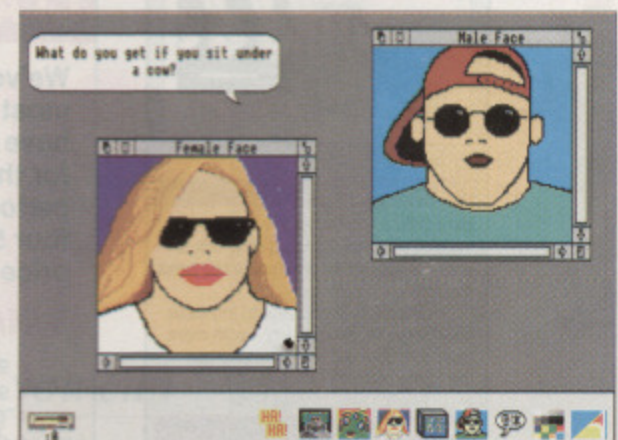


# Joining the chorus line

*Steve Turnbull checks out the latest speech software for the 32 bit Acorn machines*



A word from a droid or an alien



The mouth moves to match the speed

Name	Output quality	Output controls	Rules	Exceptions	Documentation	Support software	Price
DT-Talk	Poor	None	Fixed	None	Poor	Poor	£15.00
SpeechSystem	O K	None	Fixed	Alterable	Excellent	Excellent	£25.00
Speech!	Good	Extensive	Alterable	Alterable	Poor	Good	£19.95
ARcticate	Good	O K	Fixed	Alterable	Poor	O K	£24.95

How the products compare



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More than a manual, the guide assumes nothing. Beginning with the first sentences typed into the editor, you are led through all aspects of using the system, up to the most advanced techniques.

All the examples are also on an accompanying disc which even includes a very useful routine to print out large spreadsheets sideways.

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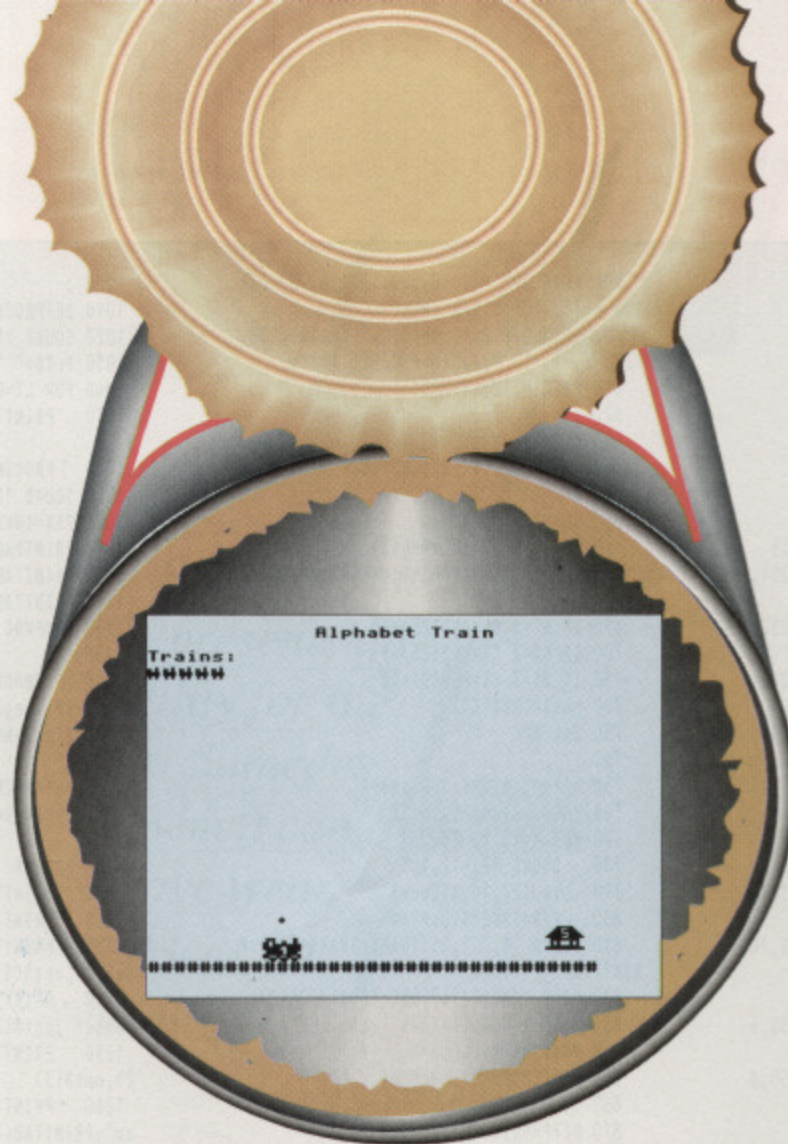
**M**Y young son, now aged three, has always been an avid button pusher. At an early age he learned to turn the television on, the washing machine off mid-cycle, and soon progressed to altering the timer on the video when it had been set to record his elder sister's favorite programme.

I was desperate to channel his enthusiasm for buttons in another direction and to give him a reward other than the howls of rage from his sister when she discovered that I hadn't recorded Sesame Street.

It was then that I introduced him to my BBC Micro, but he soon became bored by just typing in letters, and all the games which I had were too sophisticated.

As he could already say most of the alphabet, from having watched those episodes of Sesame Street which I had managed to record – but did not recognise all the letters – I set about writing a program which would help him to recognise both characters and numbers.

Type in the program and save it as



area, but this shouldn't be much of a problem.

Line 50 is the error handling procedure. Leave the REM in place until you're sure the rest of the program is working, then copy the line without it.

Now run the program and press Escape. If the machine hangs up completely it means there's a fault in the error line.

The program is based on a random selection of alphabet or number characters generated by PROCNOLET and PROCMENU sets up the combination of letters or numbers to be selected.

Initialisation of text strings and user defined characters used in the display screen is done by PROCINIT and PROCINIT2.

PROCANIMATE and PROC-SMOKE produce train animation after correct selection of a character is detected by PROCRIGHT.

● The program was an instant success, and by leaving the BBC Micro on with it running junior comes back time and time again during the day, totally unpressured. So far he has managed a high score of 115 trains.

# Alphabet soup

AlfaNum and make sure you've made no typing errors using the checksums.

When the program is run you have the option of setting upper or lower case, number characters, or a combination of any of the above. Select the appropriate combination, press R and let your child take over.

If you have a Master or Compact you can disable the Break key by rotating the barrier next to it using a screwdriver. On a Model B, Electron or B+ you can stick a small piece of card under the Break key after removing the lid.

Although the program appears straightforward and gamelike to an adult, it contains features which are designed for maximum learning impact on the child. These are:

- A flashing character which directs attention and forms a strong mental image as the child transfers attention from the screen to the keyboard and searches for the correct key.
- A wrong sound giving the child

*Andrew Le Fevre shows how you can redirect the attention of busy young button pushers*

immediate feedback on an incorrect character match, but no lasting indication of the error.

- A right sound rewarding a correct character match, together with a permanent reward in the form of the character turning into part of the display.
- An additional goal in the form of

animated action when a certain number of correct identifications have been made.

My son also likes the trains and soon discovered that he could make them move faster by holding down a key. There is a limit of about 280 correct answers before the score trains begin to encroach on the playing

```

10 REM > AlfaNum
20 REM BY Andrew Le Fevre
30 REM (c) The Micro User
40 :
50 REMON ERROR IF ERR=17 GOTO 240 ELS
E REPORT:PRINT " at ";ERL:END
60 off$="Off":on$="On ":TX=0
70 DIM opt$(3),nu(3)
80 TIS="Alphabet Train"
90 REPEAT
100  MODE6:PROCMENU
110  MODE4:PROCINIT
120  REPEAT
130    PROCNOLET
140    REPEAT
150      PROCINPUT
160      PROCFLASH
170      UNTIL ans$>""
180      IF flag2 PROCFLASH
190      IF ans$=que$ PROCRIGHT
200      IF ans$<>que$ SOUND 1,-15,5,2
210      IF ans>4 ans=0:PROCANIMATE:PRO
CINIT2
220      UNTIL ans>4
230      UNTIL FALSE
240      MODE 6
250      PRINTTAB(0,10)"Again? (y/n)";
260      REPEAT I%=INSTR("YyNn",GET$)
270      UNTIL I%>0:IF I%<3 RUN
280      CLS:END

```





```

290 :
300 DEFPROCINIT
310 VDU 23;8202;0;0;0;
320 SC$="Trains: "
330 TRK$=STRING$(5,CHR$(35))
340 flag2=TRUE:ans$="":ans=0
350 CLS:PRINTTAB(13,1)TIS
360 REM STATION
370 VDU23,250,1,3,7,15,31,63,127,255
380 VDU23,251,255,195,223,223,195,251,
251,195
390 VDU23,252,128,192,224,240,248,252,
254,255
400 VDU23,253,248,248,152,152,152,248,
255,255
410 VDU23,254,255,255,129,129,129,255,
255,255
420 VDU23,255,31,31,25,25,25,31,255,25
5
430 STT$=CHR$250+CHR$251+CHR$252
440 STB$=CHR$253+CHR$254+CHR$255
450 PRINTTAB(31,26)STT$TAB(31,27)STB$T
AB(30,29)TRK$
460 VDU23,249,6,230,230,255,255,255,10
2,102:REM SMALL TRAIN
470 REM SMOKE
480 VDU 23,242,60,60,255,255,255,255,6
0,60
490 VDU 23,242,60,60,255,255,255,255,6
0,60
500 VDU 23,241,0,0,24,60,60,24,0,0
510 VDU 23,240,0,0,24,24,0,0,0
520 REM BIG TRAIN
530 VDU23,243,63,63,51,243,243,243,255
,255
540 VDU23,244,0,0,14,14,255,255,241,22
5
550 VDU23,245,28,28,28,28,255,255,255,
255
560 VDU23,246,255,252,252,255,195,255,
60,24
570 VDU23,247,249,249,249,255,97,255,1
59,14
580 VDU23,248,63,63,63,255,240,255,15,
7

```

```

590 ENVELOPE 1,1, 0,0,0, 1,1,0, 6,-6,-
128,-128, 105,0:REM CHUFF
600 ENVELOPE 2,1, 96,0,0, 100,100,100,
127,-2,-1,-1, 126,0:REM BUILD TRACK
610 PROCINIT2:ENDPROC
620 :
630 DEFPROCINPUT:*FX21
640 ans$=INKEY$(50):ENDPROC
650 :
660 DEFPROCNOLET
670 LOCAL NX,CX:NX=RND(3)
680 REPEAT NX=NXMOD3+1:UNTIL opt$(NX)=
on$
690 IF NX=1 CX=RND(25)+65
700 IF NX=2 CX=RND(25)+97
710 IF NX=3 CX=RND(9)+48
720 que$=CHR$(CX)
730 ENDPROC
740 :
750 DEFPROCRIGHT:ans=ans+1
760 VDU31,2+ans*5,15,32
770 FOR M=15 TO 28
780 SOUND 17,-12,1,1
790 VDU127,10,ASCque$
800 PS$=INKEY$10:NEXT
810 SOUND 18,2,1,25:TRAK$=TRAK$+TRK$:P
RINTTAB(0,29)TRAK$
820 MOVE TXMOD32*40,880-(TXDIV32*40)
830 VDU5,249,4:TX=TX+1
840 PS$=INKEY$(100)
850 PROCSMOKE(0):ENDPROC
860 :
870 DEFPROCINIT2:X=0:SP$=""
880 TRAK$=TRK$:PRINTTAB(0,29)TRAK$
890 TRAINS$=CHR$(243)+CHR$(244)+CHR$(2
45):PRINTTAB(0,27)TRAINS$
900 TRAINB$=CHR$(248)+CHR$(247)+CHR$(2
46):PRINTTAB(0,28)TRAINB$
910 PRINTTAB(0,3)SC$:ENDPROC
920 :
930 DEFPROCSTOKE(LX)
940 LOCAL MX:SOUND16,1,4,5
950 FOR MX=26 TO 24 STEP -1
960 VDU31,MX-24+LX,MX,MX-24+240
970 PS$=INKEY$(20-INT(LX/1.5))
980 VDU127:NEXT
990 ENDPROC

```

```

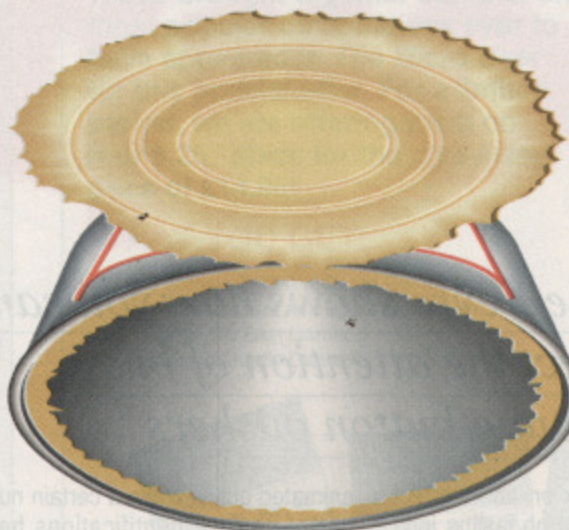
1000 :
1010 DEFPROCANIMATE
1020 SOUND 18,-12,150,8:REM BELL
1030 TLTS$=" "+TRAINS:TLB$=" "+TRAINB$
1040 FOR LX=0 TO 26
1050 PRINTTAB(LX,27)TLT$TAB(LX,28)TLB
$
1060 PROCSMOKE(LX+1):NEXT
1070 SOUND 18,-12,150,8:REM BELL
1080 PS$=INKEY$(200)
1090 PRINTTAB(0,27)SPC(30)
1100 PRINTTAB(0,28)SPC(30)
1110 PRINTTAB(0,29)SPC(30)
1120 ENDPROC
1130 :
1140 DEFPROCFLASH:VDU31,7+ans*5,15
1150 IF flag2 VDU32 ELSE VDUASCque$
1160 flag2=NOT flag2:ENDPROC
1170 :
1180 DEFPROCMENU
1190 opt$(1)=on$:opt$(2)=off$:opt$(3)=o
ff$
1200 REPEAT
1210 PRINTTAB(12,2)TIS
1220 PRINTTAB(0,6)"Choose:"
1230 PRINTTAB(5,8)"U - Upper Case Alp
habet",opt$(1)
1240 PRINTTAB(5,10)"L - Lower Case Al
phabet",opt$(2)
1250 PRINTTAB(5,12)"N - Numbers"SPC(1
2),opt$(3)
1260 PRINTTAB(5,16)"R - Run The Progr
am":PRINTTAB(7,6);
1270 REPEAT
1280 IX=(INSTR("UuLlNnRr",GET$)+1)/
2
1290 UNTIL IX>0
1300 IF IX<4 opt$(IX)=FNFLIP(opt$(IX)
)
1310 IF opt$(1)=off$ IF opt$(2)=off$
IF opt$(3)=off$ opt$(1)=on$
1320 UNTIL IX=4
1330 ENDPROC
1340 :
1350 DEFFNFLIP(opt$)IF opt$=on$ THEN =o
ff$ ELSE =on$

```

```

10 = 0 0 280 = 8215 4
20 = 0 0 290 = 9719 B
30 = 0 0 300 = A740 E
40 = 9719 9 310 = 6088 5
50 = 0 9 320 = 1936 6
60 = 7400 0 330 = AAFD 7
70 = 8912 E 340 = EF11 D
80 = 4378 0 350 = 2AF7 8
90 = BFBA E 360 = 0 8
100 = 981 0 370 = BB9 5
110 = DAE4 D 380 = BE9D E
120 = BFBA B 390 = 564A D
130 = FECA A 400 = 2A47 6
140 = BFBA 1 410 = D72B 8
150 = DADB 9 420 = F491 0
160 = 5F02 C 430 = 1F0B C
170 = 5119 1 440 = B968 7
180 = 8C8A 8 450 = 5AC8 9
190 = A304 5 460 = 4881 9
200 = 8A7F 2 470 = 0 9
210 = 9372 5 480 = D67E 3
220 = 698A 0 490 = D67E 3
230 = 226C 4 500 = AB2B F
240 = B3 2 510 = 53A 9
250 = 5DEA 1 520 = 0 9
260 = A5BC 1 530 = ACEE 5
270 = 1BAD A 540 = 2894 1

```



```

550 = B2CD 8 620 = 9719 1 690 = E5E2 0 760 = 4E21 3
560 = 4B0D A 630 = 5780 5 700 = 1A3B A 770 = 940D 7
570 = 60C9 2 640 = 1424 9 710 = BF82 C 780 = 431A F
580 = 807A 8 650 = 9719 A 720 = D246 A 790 = 1581 5
590 = F1C3 3 660 = 55AE E 730 = ED0F 8 800 = D32B 5
600 = C399 2 670 = 2354 D 740 = 9719 D 810 = 63E6 8
610 = 74F2 0 680 = 4E8F F 750 = 56C3 1 820 = 8A5D C

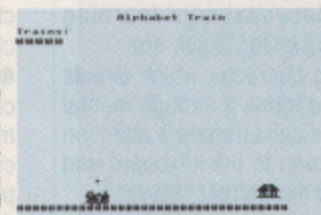
```

```

830 = 8958 E
840 = 1B7D 9
850 = 6D94 5
860 = 9719 F
870 = 75BF 5
880 = 3208 1 1100 = 733E 7 1230 = 14F0 D
890 = DE46 F 1110 = CB5F B 1240 = 5F28 8
900 = E714 E 1120 = ED0F 6 1250 = F3DA E
910 = AB4B 4 1130 = 9719 1 1260 = 3F50 5
920 = 9719 6 1140 = 10EE E 1270 = BFBA 7
930 = 8DBB 1 1150 = CEE6 C 1280 = 5B8C B
940 = 945 8 1160 = B5F8 0 1290 = 375F D
950 = 71FC 5 1170 = 9719 8 1300 = 9A67 2
960 = 112B C 1180 = 14F6 2 1310 = 8A25 6
970 = 11B1 4 1190 = D8B2 5 1320 = 2288 A
980 = AFED 8 1200 = BFBA B 1330 = ED0F C
990 = ED0F 7 1210 = DFB8 8 1340 = 9719 3
1000 = 9719 F 1220 = C6E5 B 1350 = FDC4 4
1010 = BE3A 5
1020 = 89B6 C
1030 = 6D0D 2
1040 = ACE4 F
1050 = 111B 9
1060 = 87E 4
1070 = 89B6 4
1080 = 80A1 4
1090 = F9D7 0

```

Get it right ✓







**A** FEATURE common to many of the earlier home computers was the facility for single key entry, which allowed you to enter commands from the keyboard by pressing a few keys simultaneously rather than having to type them out in full.

Although single key entry is an infrequent addition to more recent computers, it may still be useful, so this program allows the Archimedes owner to benefit from the reduced finger wear which single key entry gives.

Type the listing in, ensuring that it is correct using the checksums, save it and enter RUN.

The program saves a module called KeyMod. To use it enter \*KeyMod or double-click on its icon from DeskTop and the program will display a message to show that it has loaded.

Hold down Ctrl+Alt and press the key corresponding to the word in Figure 1 which you want to be entered.

The program as listed makes the keys produce the same words as they do on the Electron. To change which words are associated with which key, just alter the DATA statements at the end of the program, re-run the program, and re-load the module. The format of the DATA statements is:

DATA (negative inkey number), (word),

... and so on. Here the *negative*

*Stuart Tyrell  
presents an  
utility for the  
Archimedes  
which can  
save wear  
and tear on  
your fingers*



*inkey number* determines which key will generate this particular keyboard short-cut when pressed.

A list of the number associated with each key can be found in the Basic manual.

The *word* is the one that you wish to be inserted when the above key is pressed. The words are treated very much like definitions for the function keys, so RUN/M is the same as typing RUN and then pressing Return.

The end of the list of DATA statements must end with the line:

DATA 0,0

The utility will also work in the desktop, so if, as one of the DATA statements, you add:

DATA -49,"Dear Sir,"

pressing Ctrl+Alt+1 will enter *Dear Sir* into your letter if you are using IEdit in the DeskTop.

Finally, enter:

\*KeyWords OFF

to turn off the utility, and:

\*KeyWords ON

to turn it back on again.

# Key to faster typing

```
10 REM >ARCKeysRC
20 REM by Stuart Tyrell
30 REM (c) The Micro User
40 MODE0
50 PROCmc
60 PROCsave
70 END
80 :
90 DEFPROCmc
100 DIM MCX &8000
110 Help$="KeyWordKeys"+CHR$9+
120 FOR pass=4 TO 6 STEP 2
130 PX=0:OX=MCX
140 [OPT pass
150 DCD 0
160 DCD init
170 DCD final
180 DCD service
190 DCD title
200 DCD help
210 DCD command
220 .title
230 FNs("KeyWordKeys")
240 .help
250 FNs(Help$)

260 .command
270 FNs("KeyWords")
280 DCD keyentry
290 DCD &10101
300 DCD syntax
310 DCD keyhelp
320 FNs("KeyWordAuthor")
330 DCD 0
340 DCD 0
350 DCD 0
360 DCD authorhelp
370 DCD 0
380 .syntax
390 FNs("Syntax: *KeyWords
<ON|OFF>")
400 .keyhelp
410 FNs("**KeyWords <ON|OFF>
turns the KeyWord Keys on or of
f. When on, pressing Ctrl+Alt an
d a key produces a keyword.")
420 .authorhelp
430 FNs("KeyWordKeys was wr
itten by S.Tyrell for The Micro
User.")
440 .keyentry
450 STMFD R13!,(R0-R12,R14)

460 LDRB R1,[R0]
470 LDRB R2,[R0,#1]
480 LDRB R3,[R0,#2]
490 LDRB R4,[R0,#3]
500 AND R1,R1,&5F
510 AND R2,R2,&5F
520 AND R3,R3,&5F
530 AND R4,R4,&5F
540 CMP R1,#ASC("O")
550 BNE notonoroff
560 CMP R2,#ASC("N")
570 BEQ on
580 CMP R2,#ASC("F")
590 BNE notonoroff
600 CMP R3,#ASC("F")
610 BEQ off
620 .notonoroff
630 ADR R0,noterror
640 SWI "OS_GenerateError"
650 LDMFD R13!,(R0-R12,PC)
660 .noterror
670 DCD 0
680 FNs("**KeyWords must be
followed by either ON or OFF")
690 .on
700 CMP R3,#32

710 BGT notonoroff
720 .initon
730 SWI "OS_WriteS"
740 FNs("KeyWord Keys on (c
) The Micro User")
750 SWI "OS_NewLine"
760 SWI "OS_NewLine"
770 MOV R0,#255
780 STR R0,onoffflag
790 LDMFD R13!,(R0-R12,PC)
800 .off
810 CMP R4,#32
820 BGT notonoroff
830 SWI "OS_WriteS"
840 FNs("KeyWord Keys off")
850 SWI "OS_NewLine"
860 SWI "OS_NewLine"
870 MOV R0,#0
880 STR R0,onoffflag
890 LDMFD R13!,(R0-R12,PC)
900 .init
910 STMFD R13!,(R0-R12,R14)
920 MOV R0,&1C
930 ADR R1,called
940 MOV R2,#0
950 SWI "OS_Claim"

960 B initon
970 .final
980 STMFD R13!,(R0-R12,R14)
990 MOV R0,&1C
1000 ADR R1,called
1010 MOV R2,#0
1020 SWI "OS_Release"
1030 LDMFD R13!,(R0-R12,PC)
1040 .service
1050 STMFD R13!,(R0-R12,R14)
1060 CMP R1,&27
1070 BLEQ init
1080 LDMFD R13!,(R0-R12,PC)
1090 .called
1100 STMFD R13!,(R0-R12,R14)
1110 LDR R0,onoffflag
1120 CMP R0,#0
1130 BEQ callexit
1140 MOV R0,#129
1150 MOV R1,&FE
1160 MOV R2,&FF
1170 FNuseswi
1180 SWI "OS_Byte"
1190 FNoutswi
```





```

1200  CMP R1,#0
1210  BEQ notkeys
1220  MOV R0,#129
1230  MOV R1,#&FD
1240  MOV R2,#&FF
1250  FNuseswi
1260  SWI "OS_Byte"
1270  FNoutswi
1280  CMP R1,#0
1290  BEQ notkeys
1300  :
1310  MOV R0,#122
1320  FNuseswi
1330  SWI "OS_Byte"
1340  FNoutswi
1350  EOR R7,R1,#&FF
1360  ADR R5,datastart
1370  LDR R6,datalength
1380  ADD R6,R5,R6
1390  .searchdataloop
1400  LDR R1,[R5]
1410  AND R1,R1,#&FF
1420  CMP R1,R7
1430  BNE notpressed
1440  LDR R0,onepressedlast
1450  CMP R0,#0
1460  BNE callexit

1470  MOV R0,#1
1480  STR R0,onepressedlast
1490  ADD R7,R5,#8
1500  .outputloop
1510  MOV R0,#138
1520  MOV R1,#0
1530  LDRB R2,[R7],#1
1540  CMP R2,#0
1550  BEQ callexit
1560  CMP R2,#ASC("|")
1570  BNE notcontrol
1580  LDRB R2,[R7],#1
1590  CMP R2,#ASC("|")
1600  SUBNE R2,R2,#64
1610  CMP R2,#0
1620  MOVL R2,#ASC("|")
1630  .notcontrol
1640  FNuseswi
1650  SWI "OS_Byte"
1660  FNoutswi
1670  B outputloop
1680  .notpressed
1690  LDR R1,[R5,#4]
1700  ADD R5,R5,R1
1710  CMP R5,R6
1720  BLT searchdataloop
1730  .notkeys
1740  MOV R0,#0
1750  STR R0,onepressedlast

```

```

1760  .callexit
1770  LDMFD R13!,(R0-R12,PC)
1780  .onoffflag
1790  DCD 0
1800  .onepressedlast
1810  DCD 0
1820  .datalength DCD dataend-da
tastart

```

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```

1830  .datastart
1840  FNMakedata
1850  .dataend
1860  J:NEXT pass
1870  ENDPROC
1880  :
1890  DEFFNs(Text$)
1900  [OPT pass
1910  EQU$ Text$
1920  DCB 0

```

```

1930  ALIGN
1940  J:=0
1950  :
1960  DEFFNuseswi
1970  [OPT pass
1980  MOV R9,PC
1990  ORR R8,R9,#3
2000  TEQP R8,#0
2010  MOVNV R0,R0
2020  STMFD R13!,(R14)
2030  J:=0
2040  :
2050  DEFFNoutswi
2060  [OPT pass
2070  LDMFD R13!,(R14)
2080  TEQP R9,#0
2090  MOVNV R0,R0
2100  J:=0
2110  :
2120  DEFFNmakedata
2130  RESTORE
2140  READ nX,text$
2150  WHILE nX<0
2160  qX=LEN(text$)+1
2170  IF qX MOD 4>0 qX=qX+(4-qX
MOD 4)
2180  [OPT pass
2190  DCD nX
2200  DCD qX+8

```

```

2210  FN$(text$)
2220  J
2230  READ nX,text$
2240  ENDWHILE
2250  =0
2260  :
2270  DEFPROCsave
2280  SYS "OS_File",10,"KeyMod",
&FFA,,MC%,0%
2290  PRINT"Module Saved as ""K
eyMod""
2300  ENDPROC
2310  :
2320  DATA -17,LOCAL,-34,RESTORE
,-35,ELSE,-52,RUN|M,-36,THEN,-69
,REPEAT
2330  DATA -54,UNTIL,-38,INPUT,-
55,OLD|M,-56,PLOT,-66,AUTO,-82,S
TEP
2340  DATA -51,DRAW,-68,FOR,-84,
GOTO,-85,DEG,-70,RAD,-71,CHAIN,-
87,LIST
2350  DATA -98,END,-67,PROC,-83,
COLOUR,-100,VDU,-101,RENUMBER,-8
6,NEXT
2360  DATA -102,MODE,-103,LOAD,-
104,SAVE,-105,PRINT
2370  DATA 0,0

```

```

10 = 00
20 = 00
30 = 00
40 = FA1B B
50 = AC81 B
60 = 90DB D
70 = FD2E 7
80 = 9719 3
90 = 3D04 6
100 = 755B E
110 = 12D5 1
120 = A1D2 0
130 = 4E80 9
140 = 4E48 B
150 = 9CF6 3
160 = 3DB8 3
170 = BF16 3
180 = 758A 0
190 = 9C18 3
200 = 48C 9
210 = 6F34 4
220 = FD02 B
230 = 1C43 D
240 = 5B46 1
250 = E0DB F
260 = E454 D
270 = FE77 2
280 = 4CF2 B
290 = D934 1
300 = 3CBB 7
310 = A395 A
320 = 12B2 F
330 = 9CF6 1
340 = 9CF6 0
350 = 9CF6 D
360 = 156 1
370 = 2E56 2
380 = 5A3C 1
390 = 347D F
400 = 28F5 4
410 = 24B F
420 = C1D7 C
430 = 7015 3
440 = C11 A
450 = 5F9 8

```

```

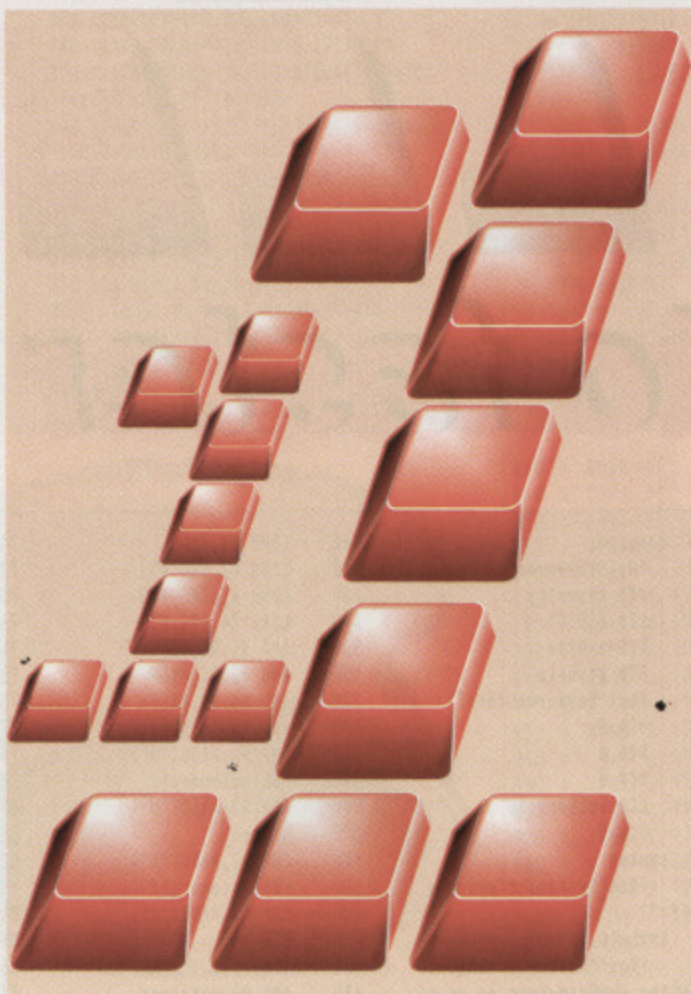
460 = B2FE 7
470 = DBBE C
480 = 65CE 5
490 = E754 9
500 = 6472 2
510 = 87D6 D
520 = 2955 B
530 = 50BF 8
540 = 3EB7 6
550 = F832 1
560 = 24C3 9
570 = C05A A
580 = 8D62 C
590 = F832 6
600 = 6641 1
610 = 685 9
620 = 7B35 2
630 = FB99 4
640 = 2E0B D
650 = C39 F
660 = DBD3 5
670 = 9CF6 D
680 = 3F5F B
690 = BBB E
700 = 9F78 D
710 = 822E 7
720 = A5E1 9
730 = 567A 7
740 = 2FD1 D
750 = C6E8 D
760 = C6E8 9
770 = DB9F E
780 = BBE2 B
790 = C39 B
800 = 8FA2 D
810 = F8AC 1
820 = 822E 4
830 = 567A 2
840 = DDF8 8
850 = C6E8 9
860 = C6E8 3
870 = BB5B 8
880 = BBE2 1
890 = C39 8
900 = 6272 9

```

```

910 = 5F9 5
920 = 96A9 D
930 = B2C1 6
940 = 5633 8
950 = AFC8 6
960 = EE1F B
970 = DE0C E
980 = 5F9 0
990 = 96A9 4
1000 = B2C1 1
1010 = 5633 D
1020 = 17F4 9
1030 = C39 A
1040 = FEEA E
1050 = 5F9 F
1060 = 6F31 1
1070 = 427C 4
1080 = C39 D
1090 = 5E1C 9
1100 = 5F9 E
1110 = AF78 4
1120 = E6AF 3
1130 = 878D D
1140 = DAD4 C
1150 = 2201 6
1160 = DC82 C
1170 = F98E 3
1180 = BF50 4
1190 = C59E 6
1200 = 901B 4
1210 = 8C0A 0
1220 = DAD4 2
1230 = 322D 6
1240 = DC82 3
1250 = F98E A
1260 = BF50 0
1270 = C59E B
1280 = 901B B
1290 = 8C0A 1
1300 = 9719 7
1310 = 6BBF E
1320 = F98E 1
1330 = BF50 5
1340 = C59E 7
1350 = 651A 2

```



```

1360 = 9188 F
1370 = 2A22 5
1380 = 3D07 A
1390 = 9BF9 D
1400 = 9D6E F
1410 = 3978 4
1420 = DB94 9
1430 = 27CE F
1440 = 5491 3
1450 = E6AF C
1460 = 79FB 7
1470 = AB7A E
1480 = 77F9 6
1490 = 5FC0 7
1500 = 5595 5
1510 = F9C4 F
1520 = CDEF E
1530 = 6CA1 5
1540 = BC7 5
1550 = 8780 F
1560 = 8F06 C
1570 = 78D1 5
1580 = 6CA1 0
1590 = 8F06 8
1600 = F72C D
1610 = BC7 1
1620 = 4702 0
1630 = FBD6 C

```

```

1640 = F98E 9
1650 = BF50 9
1660 = C59E A
1670 = DD45 4
1680 = A4C9 E
1690 = F942 6
1700 = 9562 8
1710 = 144 9
1720 = F267 0
1730 = A113 1
1740 = BB5B 2
1750 = 77F9 3
1760 = FAFC 9
1770 = C39 D
1780 = F869 B
1790 = 9CF6 9
1800 = 4B64 A
1810 = 9CF6 7
1820 = 8458 B
1830 = 76E4 2
1840 = 7555 E
1850 = 4267 A
1860 = 7DC 3
1870 = ED0F 7
1880 = 9719 8
1890 = 7BA9 F
1900 = 4E48 D
1910 = 7BD8 6
1920 = 2E56 3
1930 = 24FA 9
1940 = B43 1
1950 = 9719 D
1960 = 990F 7
1970 = 4E48 C
1980 = 5BD2 3
1990 = DF13 8
2000 = 5E5E 9
2010 = DB5B C
2020 = ED3D D
2030 = B43 0
2040 = 9719 F
2050 = A51F C
2060 = 4E48 6
2070 = F9A7 6
2080 = 28EA 6
2090 = DB5B 8
2100 = B43 A
2110 = 9719 A
2120 = FF06 C
2130 = 9FF8 A
2140 = B750 C
2150 = 38D4 0
2160 = 5699 1
2170 = 68DF 4
2180 = 4E48 B
2190 = ED42 0
2200 = AC66 4
2210 = C422 B
2220 = 8B58 8
2230 = B750 0
2240 = 3882 7
2250 = 459A 3
2260 = 9719 D
2270 = 7A2C 9
2280 = 9B91 D
2290 = 1EA2 E
2300 = ED0F 2
2310 = 9719 5
2320 = 10AE 0
2330 = 6CB4 F
2340 = DFAE 7
2350 = 9D9E C
2360 = A4FF 5
2370 = 3BFA 2

```





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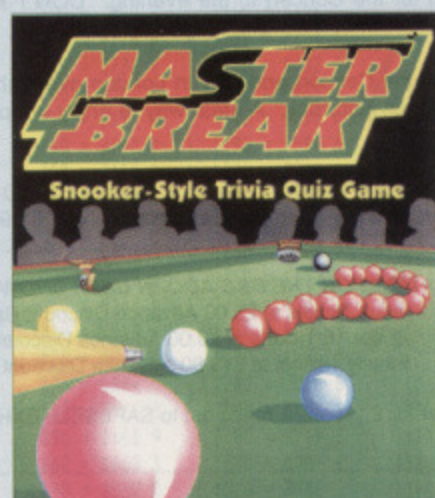
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# PRIZE letter

## Printing graphics

MY Epson LX400 printer uses the extended Ascii character set - 128 to 255 - for italics and graphics. While italics can be switched on and off simply using ESC 4 and 5, I am not aware of any printer or computer commands which will provide a simple keyboard conversion for graphics.

Reading the May issue of The Micro User I noticed

that Peter Gaunt's article showed how to use an assembly code program to convert the # into £ on the Epson. This could be used with Wordwise.

The following programs use the same method to access the graphics character set direct from the keyboard.

When run they will generate machine code utilities which are saved to disc as GChrs and TChrs. When \*RUNed, GChrs will replace the standard character set with the codes required for the printer's graphic characters, \*RUNing TChrs will

revert to normal characters.

They can be called in Inter-Word using the embedded command facility at any point in the text. The subsequent characters will appear as alpha-numeric on the screen but as graphics on the printer. \*RUN TChrs is used to revert to normal mode.

Of course you need to have pre-selected the graphics character set using Inter-Word's printer control code menu and it is advisable to select uni-directional printing for accurate graphics printing. - Peter Harris, Bath.



WANT to write to The Micro User? The address is:  
Letters, The Micro User, Europa House, Adlington Park, Macclesfield SK10 4NP.

Writers of the most interesting letters receive a £10 prize.

```

10 REM Keyboard Graphics
20 REM Listing one
30 REM By Peter Harris
40 REM (C) The Micro User
50 oldvec=&20E:newvec=&230
60 FORIX=0TO2STEP2
70 PX=&A60
80 OPTIX 85 .init
90 LDA oldvec
100 STA newvec
110 LDA oldvec+1
120 STA newvec+1
130 LDA#start MOD &100
140 STA oldvec
150 LDA#start DIV &100
160 STA oldvec+1
170 RTS
180 .start
190 PHA
200 LDA&D0
210 AND#1
220 CMP#1
230 BNE restore
240 PLA
250 CMP#33
260 BCCold
270 ADC#127
275 .old
280 JMP(newvec) 290 .restore
300 PLA
310 JMP old
320 J
330 PX=PX+1
340 NEXT
350 x$="SAVE GCHRS "+STR$init+"
"+STR$PX
360 DIM B 30:SB=x$:X$=B MOD &1
00:YX=B DIV &100
370 CALL &FFF7

```

10 =	0 0	210 =	4E9D 9
20 =	0 0	220 =	83A9 6
30 =	0 0	230 =	9ADC 0
40 =	0 0	240 =	4E8A 8
50 =	7FE4 4	250 =	68B9 9
60 =	E48D 6	260 =	3E95 2
70 =	1220 7	270 =	8DC2 A
80 =	F301 D	275 =	402B E
85 =	6272 7	280 =	CCCC 0
90 =	D0DA A	290 =	8350 9
100 =	2CA4 7	300 =	4E8A 3
110 =	837E 9	310 =	FDB2 8
120 =	4A8B 6	320 =	8B58 B
130 =	2EA4 6	330 =	5569 9
140 =	4103 9	340 =	2C83 7
150 =	A5E4 6	350 =	1671 5
160 =	F2F0 1	360 =	9BA0 9
170 =	9843 F	370 =	17A4 5
180 =	3208 5		
190 =	824E 0		
200 =	2288 B		

Get it right ✓

```

10 REM Keyboard Graphics
20 REM Listing two
30 REM By Peter Harris
40 REM (C) The Micro User
50 oldvec=&230:newvec=&20E
60 FORIX=0TO2STEP2
70 PX=&A60
80 OPTIX 85 .init
90 LDA oldvec
100 STA newvec
110 LDA oldvec+1
120 STA newvec+1
130 RTS
140 J
150 PX=PX+1
160 NEXT
170 x$="SAVE TCHRS "+STR$init+" "+STR$PX
180 DIM B 30:SB=x$:X$=B MOD &1
00:YX=B DIV &100
190 CALL &FFF7

```

10 =	0 0	100 =	2CA4 7
20 =	0 0	110 =	837E 6
30 =	0 0	120 =	4A8B 3
40 =	0 0	130 =	9843 1
50 =	A8E4 4	140 =	8B58 E
60 =	E48D 8	150 =	5569 0
70 =	1220 B	160 =	2C83 6
80 =	F301 D	170 =	891A E
85 =	6272 B	180 =	9BA0 9
90 =	D0DA 5	190 =	17A4 9

Get it right ✓

Ltd in Manchester had one in stock and were fairly local, I took my machine there to have it fitted.

However, on getting home with my upgraded machine it began to crash intermittently and by the end of the day had died completely. I assumed that the Arm3 was faulty and took the machine back to Dabhand.

The person who had fitted the Arm3, Neil, spent quite some time checking the machine over and replaced the Arm3 with the one from his own machine. This seemed to cure the problem. However, when I got home the problem returned.

I was unable to return to Dabhand until the following week, but Neil was most helpful on the telephone and

upgraded to 4Mb ram and 47Mb hard disc last year. The fitting was carried out by a firm in Leeds which shall remain nameless. I believed them to have a good reputation since they were well established in the BBC Micro world.

In May I decided to have an Arm3 and VIDC Enhancer fitted to my computer, and since Dabhand Computing

## Dabhand hits high note

ONE frequently hears disaster stories about computer equipment and suppliers, and so when an instance of particularly good service occurs it makes a very welcome change.

I use an Archimedes 410/1 professionally, and had it

## Faulty module listing

THE ModuleHead program featured in the May edition of The Micro User has an error in it which prevents your module header from being saved to disc correctly. This can be solved by loading the ModuleHead program and entering the

lines shown below.

```

505 dat$ = " "
720 IF NOT end% AND dat$ =
" BPUT#fn%,dat$
790 dat$ = "DCD "+data$
810 dat$ = "DCD 0"

```

- Edward Turner, Maidenhead.

● Thanks for pointing this out.





reassured me that there was probably nothing wrong with the basic Archimedes as they are usually very reliable.

The following week I returned to Dabhand. Neil spent over two hours disassembling my computer and eventually traced the fault to the ram expansion which had been fitted by the other company.

This consisted of 24 simm chips which had been treated brutally: Instead of being pressed gently into their sockets they had been rammed in carelessly and most of the pins had been bent over under the chips.

In total Neil must have spent over three hours repairing shoddy workmanship which had nothing to do with him. He did not charge for any of it. He is the sort of enthusiastic expert who really inspires confidence.

Needless to say, I shall return to Dabhand for anything I require in the future. — **J. F. Sebastian, Prestbury.**

● It certainly is refreshing to receive letters like this. Fortunately the Acorn market is full of enthusiasts who will go out of their way to help users.

## More power to the Electron

I HAVE an Electron, the Software Bargain's full expansion board and a Plus Three ADFS disc drive. Is it possible to regain the memory lost by the Plus Three?

Can I also expand the memory to 64k? Is there a graphics package that will run on this machine? And does the scanner from Watford Electronics work with an Electron? — **S. Gibson, Dukinfield.**

ALL programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur corrections are published as a matter of urgency. Should you encounter error messages when you type in a program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the letters pages.

● PRES do versions of DFS and ADFS for the Electron which run in sideways ram and leave Page at &E00. Both cost £17.19 on 3.5in disc. There is also a package available from them consisting of the sideways ram and software for £55.95. The extra ram plugs into the Plus One.

You can expand the memory to 64k using Slogger's Shadow Ram Board but I think PAGE will still be set to &1D00. You could go even further and buy Slogger's 64k Turbo Board.

This will not only give you the extra memory but also a significant increase in speed, all at the flick of a switch.

The Watford Scanner does not work with the Electron and the only graphics package for the Electron that I know of is available from The Fourth Dimension.

## Thrusting cheat

I HAVE recently been playing the game Thruster, which you sent out on the monthly disc, and I have found a cheat!

As soon as you get on to the level you want to skip press SHIFT for one second. This will not work if the ship has started to fall though. You will find that when you release the key the message: Entering Level.. will appear. — **Richard James Wareham, Huntingdon.**

## Quite a gamble

I WAS interested to read the recent letter from Kike Carr. He was replying to the article I wrote entitled "Bucking



the Odds" which looked at some of the points you need to consider when writing a gambling program.

Mr Carr might be interested to know that I have written a book on this subject which goes further than the article and actually puts theory into practice with programs to test a number of gambling systems. The book, entitled Basic Betting — The Micro Bytes Back, should be out by the end of the year and is written under the pen name of Graham Deane.

I should point out that the programs were written using the PC GWBasic interpreter. This was requested by the publisher to try to give the book wider appeal. However I wrote the programs on a BBC A3000 using the PC emulator. Therefore the other BBC A3000 and Archimedes users will be able to run them. — **Graham Kendall, Kendal, Cumbria.**

## Hard protection

I HAVE recently bought a database and installed it on my hard disc as per the manual. However when the application is called, due to the software protection, the original floppy disc must be in the drive zero.

This, in my opinion, makes installation on hard disc pointless. A help file within

## Electron View on Archimedes

Following the recent letters in January and April about View and Viewsheets on the Archimedes using the BBC Emulator I found that the Electron version of View works fine.

Simply click on the Emulator, then exit it again, select 'CacheRom and put View into socket 15 so that it gets a high priority. Then select 'EmulateBBC to enter View.

The hardest part was translating the Electron keys to work on the Archimedes, but I have

found all but four keys work on the Electron — those for the Electron K, I, M and N. Print is equivalent to F0 on the Archimedes.

Arc F0 to F9	
Elk 0 to 9	
Arc F0 to F9 with Shift	
Elk A to J	
Arc F0 to F9 with Ctrl	
Elk Q to Z	
Arc £ with Shift	Elk 0
Arc Page Up	Elk P

The Arc cursor keys with Ctrl replace \_ and / — **E. F. Kelly, Merseyside.**

the application states that an unprotected version can be obtained by returning the original disc and quoting the serial number of your machine.

But a nominal fee is also required — the company's interpretation of the word nominal is clearly at odds with my own, as the fee they require is £35 which is a third of the original cost.

While I have no complaint with the quality of the software, I feel that we users are being taken advantage of. Had I known these facts prior to ordering the package I would probably have chosen one of the rival databases. — **M.A. Bodley, Lincoln.**

● This is a very common way of protecting a piece of software against theft after it has been installed on a hard drive. Loading the program is still faster from the hard disc.

The only other way that we know of is to use a Manual lock, where the user is required to enter a word from the manual each time the program is run, which is clumsier still.

The alternative for software houses is to register each user and charge much higher prices for the software. The company are offering you the choice of a protected disc or registering, which seems quite reasonable, although perhaps the cost is a little high.

Most software for the Archimedes is still very cheap

in comparison with other machines but it can only stay that way if sales are high enough. Of course, if people did not steal programs then protection techniques like these would not be necessary.

## Listing Chaos

I am glad to see that you published my article on Chaos in the July issue of The Micro User. However I would like to point out a couple of mistakes that crept into the listing.

Line 380 in the listing for diagrams of Chaos should have read:

```
IF NX <= TX GOTO 440
```

Also some extra zeros seem to have crept into the table at the bottom of page 48. — **James Vernon, Devon.**

## Loading rom images

IN RESPONSE to the letter from Mr D. G. W. Rance in the May issue of The Micro User it is indeed possible to load rom images into Sideways Ram in the Slogger Rombox Plus.

Either 8k or 16k static ram chips can be used — 6264, 62256 available from



# The Fourth Dimension

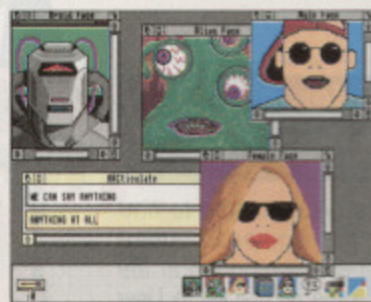
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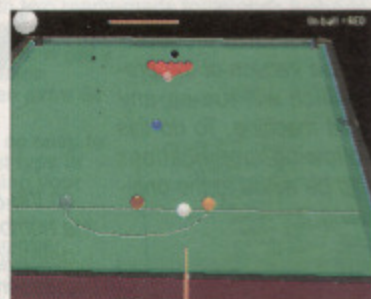
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LETTERS

Watford Electronics or other component stockists. If the 8k device is used it must be inserted in the third socket – page 6/14. The 16k device can be used in any of the rom sockets.

The Rombox plus software includes the commands \*RSAVE to save rom images and \*RLOAD to load images into the ram.

The intention was that commonly used roms would occupy the rom sockets while those used less frequently could be loaded into Sideways Ram as needed. This would reduce the risk of damage to the roms.

If Mr Rance or any other reader would like any information on this or any other Slogger product I can be contacted at the following address. – **Phil Williams, Tornado Software, Tegfan, National Street, Tywyn, Gwynedd LL36 9DB, Tel: 0654 710204.**

## Ultra Intelligent Mixup

Thank you for publishing my letter about the UIM cheat – unfortunately somewhere along the way line 150 was put through the wringer. It should read:

```
VX=VX+(DX>>>31)
```

– **David Radford, Bolton.**

- We have had several letters pointing this out, sorry.

## Different perspective

I was disappointed to find that the Computer Aided Perspective program in the July issue of The Micro User would only work on machines with shadow screen.

However I have produced a modified version of the program which will run on any standard machine. To do this the following modifications need to be made to the original listing:

```
60 MODE 7
270 MODE 4: PROCpreview:MODE
7: GOTO 160
420
PROCeraseframe1(numpt%+1)
430 PROCdrawframe2(ZR1)
440 PROCframe2on
500 PROCeraseframe(ZR1)
510 PROCdrawframe1(ZR1)
520 PROCframe1on
960 VDU 19,0,4;0;
970 VDU 19,1,7;0;
1000 VDU 19,0,4;0;
1010 VDU 19,1,7;0;
1040 GCOL 2,2
1080 GCOL 2,2
1120 GCOL 1,1
1160 GCOL 1,1
```

Although much of this fix defeats the object of screen switching by having frame one and two drawn in the same colours, it does work in Mode 4 and so frees extra memory. – **James Aylett, Salisbury.**

## Speedy deletion

IN the July issue of The Micro User I noticed a letter from W. Cumins. He was having trouble deleting files after copying



on the Archimedes. There are a number of other methods of deleting locked files without unlocking them.

If you enter \*WIPE (path-name) FR~C~V on the command line – obtained by pressing F12 – the specified file or directory will be deleted.

If you are transferring files via the ram disc, then instead of dragging Select when copying files you can drag with Shift held down. This will move the file by copying it and deleting it in one operation.

Incidentally, if you double-click on applications and directories with Adjust instead of Select, the Filer will close the parent directory viewer automatically.

Other useful operations are that clicking on the close icon of a filer window with Adjust opens the parent directory while closing the current one. And dragging with Adjust when transferring files closes the directory viewer after the copy or move. – **Gerald Holdsworth, Kent.**

- It can often be annoying trying delete a whole directory structure which contains

some locked files. But there is a PD program called !Wiper which will delete an entire structure including locked files all in one go.

## Colouring it in

I HAVE been wanting to put colours in my programs for ages but it never explains clearly in my books. Please could you show me how? – **Christopher Smith, Bradford.**

- It is very easy to add colour to Basic programs on Acorn computers. The number of colours you can have on the screen at once is limited by the current graphics mode.

For example, in Modes 6, 3 and 0 you can only have two colours. In Modes 5 and 1 there are four colours and in Mode 2 sixteen colours although eight of these are really just flashing combinations of the other eight. For example, MODE 1 at the start of the program will put the computer into a four colour mode.

To change the colour of text use the COLOUR command followed by a number; 3 = white, 2 = yellow and 1 = red. For example, after COLOUR 1 the colour of any new text will be red.

To change the colour of lines in graphics you must use the GCOL command.

This is more complicated and has two parameters, but if the first one is zero the second one will always set the colour of lines in a similar way to the COLOUR command. For example, after GCOL 0,2 the colour of any new lines will be yellow.

There's lots more to this, but that should get you started.

## Magic mistake

Thanks for using my Magic Squares program in the August issue of Micro User. Unfortunately there is an error in line 180. This should read:

```
180 IF N < 37 OR N > 54 D =
D - C ELSE A = A - B
```

– **Jon Millington, Bristol.**

## Macro tip

MACRO assembly is a useful technique which helps to make Assembly language source code more readable and reduces the amount of typing required. It is illustrated in the DabHand book – Archimedes Assembly Language – but a potential snag is not mentioned.

The problem appears when using forward addressing to a label within the body of the macro and the same macro is used more than once. For example, consider the following:

```
[OPT PASS
FNmacro(1)
FNmacro(2)
]
```

On the first pass, any forward addressing to labels within the macro will be left as the label has not yet been encountered. When the macro is called a second time all references to the label will refer to the last definition – the one in macro(1).

On the second pass the label will have been reassigned to the value received in macro(2). So the forward addressing in macro(1) will refer to macro(2). All forward addressing has gone completely wrong.

The solution is for each function to have its own two-pass loop to update all internal labels immediately before the final code is generated.

Even this is not totally satisfactory, as the function may need to branch into the main program. So the inbuilt two-pass must only be used on the second pass of the main code:

```
DEF FN macro(J%)
LOCAL Q%,PAX
Q% = P%
FOR PAX = 0 TO PASS STEP 3
P% = Q%
[OPT PAX
;macro code
]
NEXT : = J%
```

– **A. J. Bush, Newcastle-upon-Tyne**

- Thanks for the tip. Macros are certainly useful on the Archimedes and A3000 where memory usage is not as important as speed.

## Carrying the Torch

Torch Computers went out of business in February 1990. The computer manufacturing part of Torch's operations was bought by the Cube Group who went out of business themselves in January 1991 and were bought by Proactive Control.

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I worked at Torch and sub-

sequently for Cube for over four years during which time I participated in the development of many products. I also ran the BBC Micro-based product support.

As Torch began disposing of the Acorn-related items I was able to save or buy some of them and so I still have many of the original manuals and discs for the system.

If any Torch users need support or help I would be

pleased to answer their questions. If I do not know the answer I can usually find someone who does.

If anyone wants to get in touch with me they can contact me by post at the following address. Please note that this is a labour of love rather than a way to get rich quick, so I would appreciate a SAE with enquiries. – **Mark Cook, 70 Stubbs Lane, Braintree, Essex CM7 6XB.**





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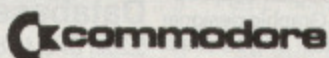
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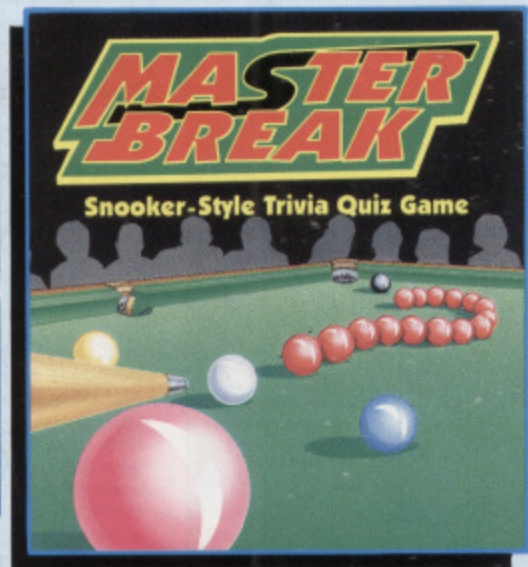
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Quiz Game for 1 to 4 Players

SCIENCE & NATURE, POP MUSIC, GEOGRAPHY, HISTORY. Over 1500 questions in the BBC Micro/Master version and 1000 questions in the A3000/Archimedes version. Includes sound effects and digitised sound questions.

Play to the highest break - you might even reach 147. In the 2 to 4 player game, compete for the highest score and highest break.

After each question, then choose your colour - red, blue, green or black. The black ball question? You've used all the balls in the POCKET - if you miss, it's a FOUL SHOT!

A TRIVIA QUIZ AND SNOOKER MATCH GAME.

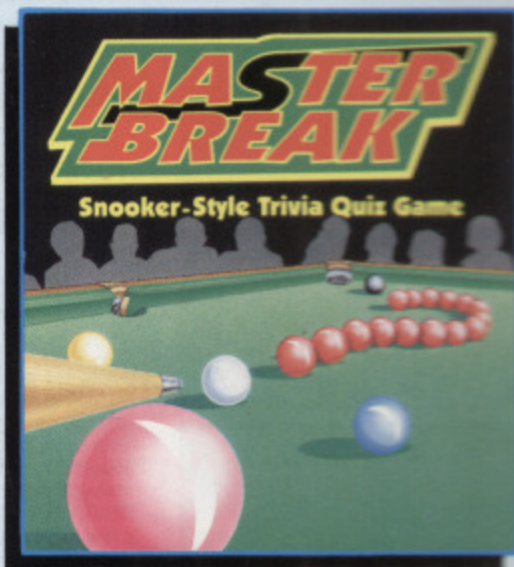
BBC Micro/Master, Electron & A3000/Archimedes



BBC Micro/Master



A3000/Archimedes



## SAM 15



Last Ninja 2



Cyborg Warriors

## PLAY IT AGAIN SAM 15 A New Action-Packed Four-Game Compilation

### LAST NINJA 2

The Last Ninja is back with a vengeance! Battling with fists, shuriken stars, swords and lots of other devious weapons, against the evil Shogun in downtown New York.

"Animation is excellent and there's lots of detailed scenery. The puzzles are quite fiendish" ....Micro User.

### NETWORK

An action-packed 'Top Ten' game by Peter Scott, featuring teleport machines, lifts, springs, strange aliens and lots, lots more. Shoot your way through more than 100 different screens as you attempt to collect the twenty parts of the 'Flyche' machine. Nerve-tingling excitement.

BBC Micro/Master & Electron

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A massive arcade adventure with brilliant graphics, as you control SPRAT, the Small Partially Robotic Alien Time-traveller. Five different levels: FORTRESS, TECHLEV, DERELICT, THE UFO and ANCIENT.

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THE MICRO USER

# THE MICRO USER

Volume 9

Number 8

October

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Vol. 9 No. 8