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MACFORMAT

ISSUE 14 ■ JULY 1994 ■ £3.95 WITH HD DISKS

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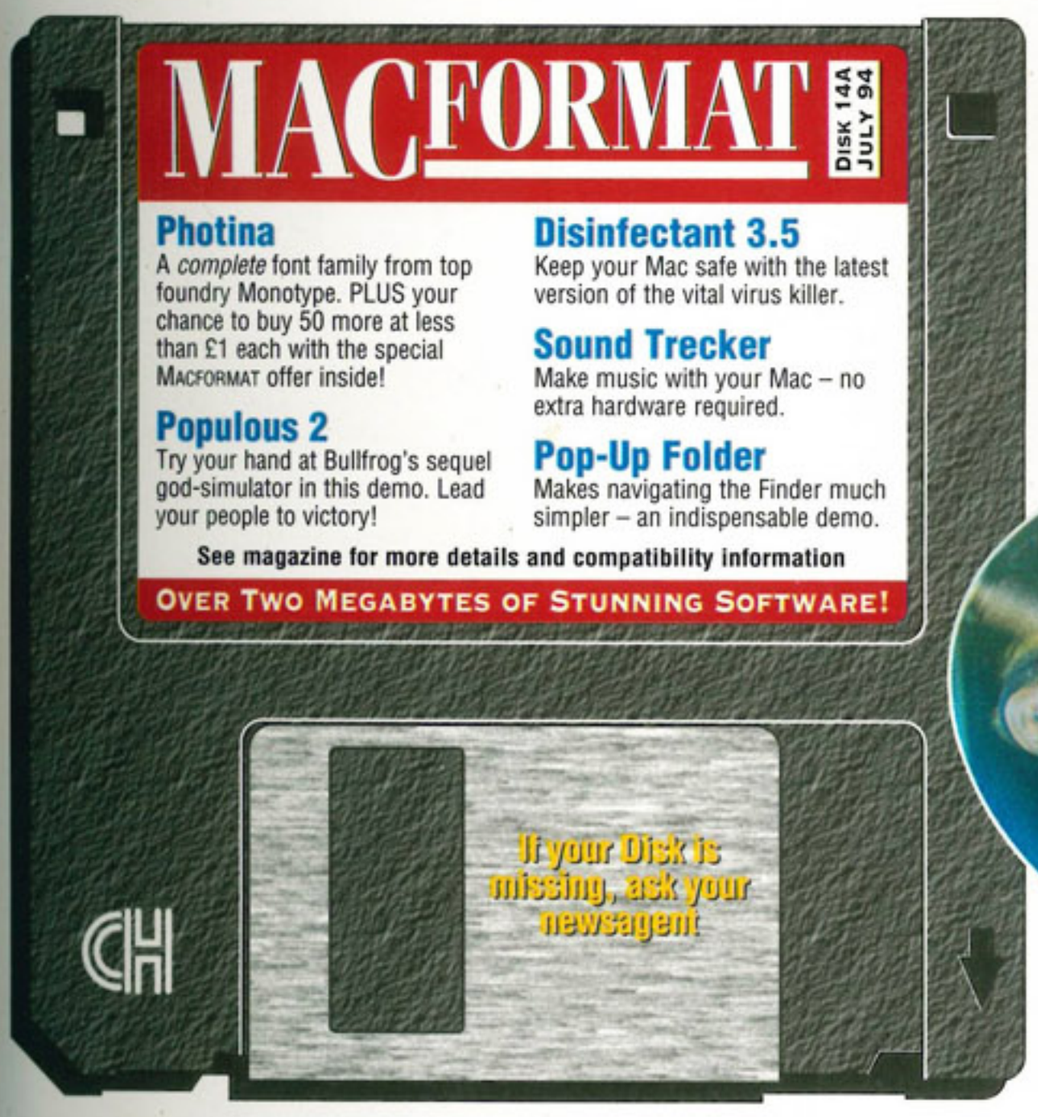

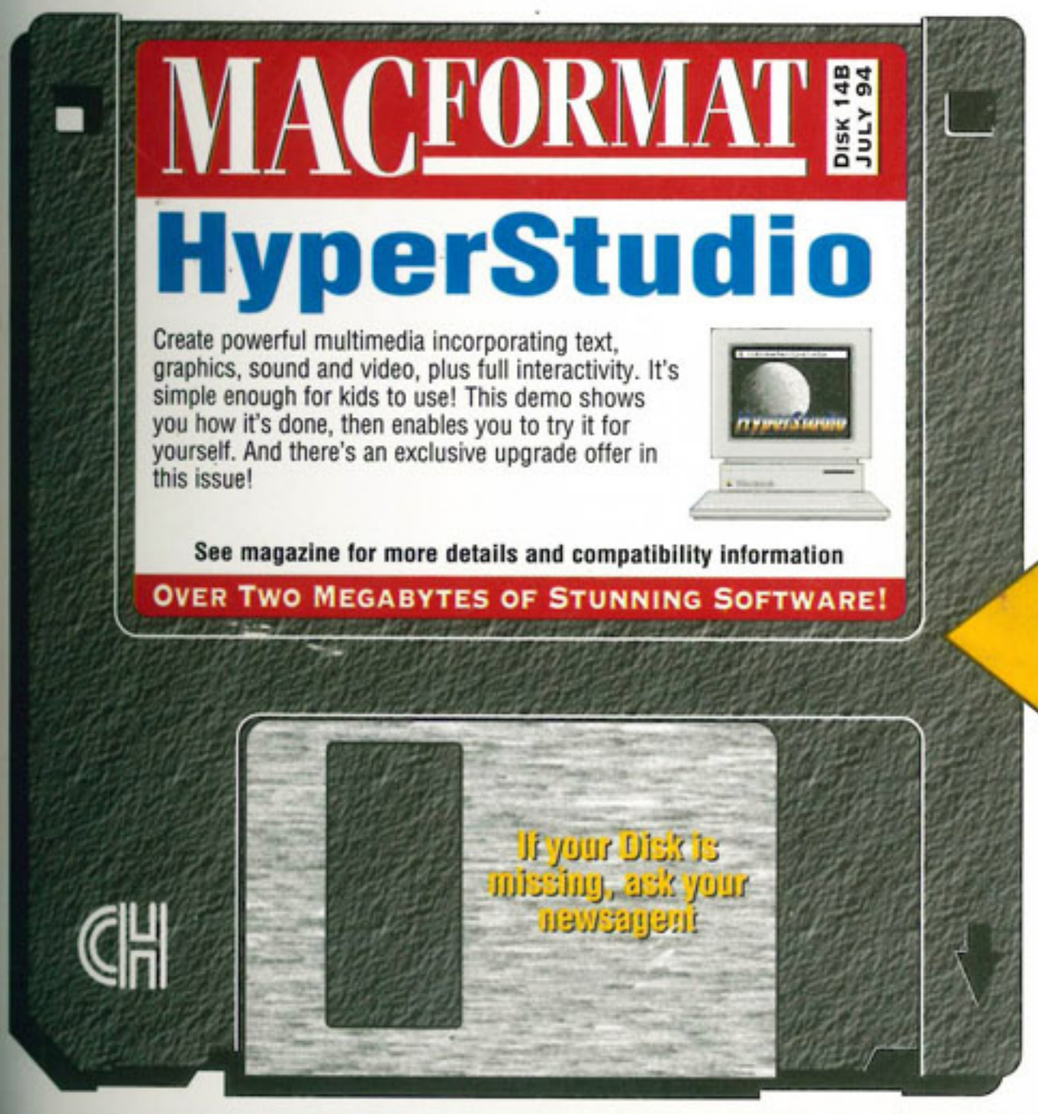

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Please check for availability.

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Product Update...

WizTools. A set of 8 utilities for System 7 that make using your Mac more efficient and enjoyable. SubMenu displays the contents of the Finder in your Apple menu, making navigation a breeze. Launcher gives you one-click access to your important applications and documents. FinderTools lets you optimise and speed up the Finder. Keystroke recorder permanently records everything you type in a 24 hour period, in case of system errors you now stand a chance of recovering some work. WorldClock lets you view times from around the world. ColourSwitcher lets you quickly change monitor depths. Twins provides file synchronisation and backup quickly and reliably. Finally, WatchFolder can monitor any folder that's being shared and alert you when there is a change—an economical network mailbox system.
SRP £69.99

Crystal Caliburn. From the same people who brought you Tristan and Eight Ball Deluxe, this new pinball simulation game is very fast and a big improvement, with ramps, multiball mode with 3 balls, surprise attack (which launches multiball at you with no warning whatsoever!) and autobattle, which means if you haven't scored enough points before you lose the ball, you get another go.
It's very real, you can even "tilt" with the space bar, but it's quite hard to control and aim the ball with the flippers when you first start playing.
Once you have the hang of it though, you won't want to quit!
SRP £39.99

Return to Zork. An epic adventure... underground. Based on the infamous Zork series this outstanding adventure includes fully rendered 3D graphics, original music, over an hour of spoken dialogue and video starring known actors. The interface has been redesigned from the ground up into what is probably the most intuitive adventure around, including the ability to have 'real' conversations. Character responses are determined by 'your' body language through a simple point and click icon system. In addition you have a camera and tape recorder which can be used to record conversations and store images containing vital clues.
'It's of such unparalleled quality that it must become the model for CD ROM adventure game designers' - CD ROM Today magazine.
'You'll see the best use of full-motion video in any CD ROM... You're not watching a movie. You're in a movie...' Multimedia World.
CD ROM SRP £42.54

All prices shown are exclusive of VAT.

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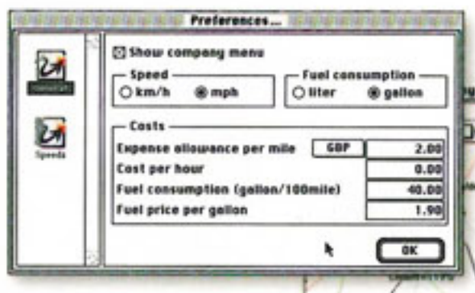
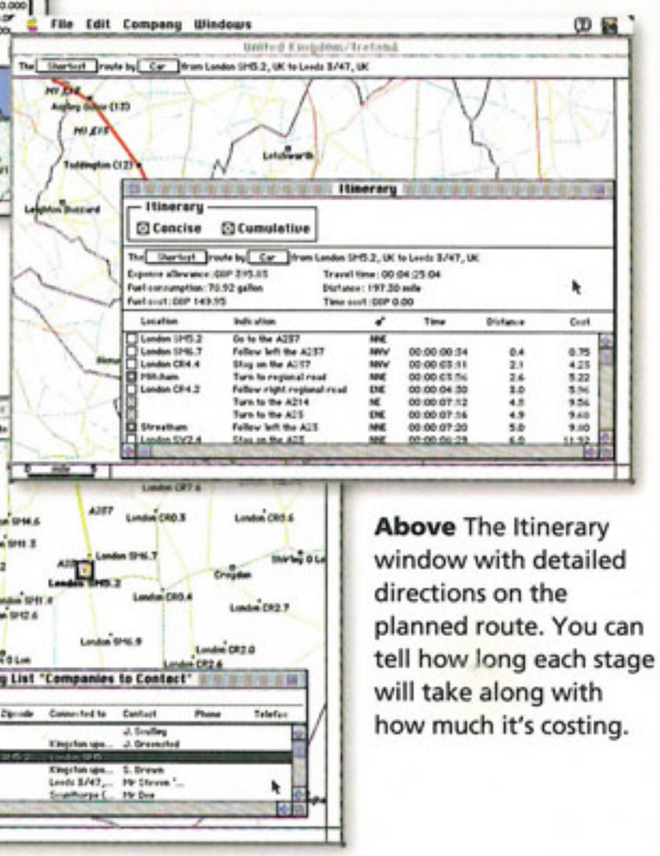
SignPost

The International Route Planner

Left The SignPost screen showing detail from the Midlands. The Map overview on the left lets you easily jump round the UK Map. The legend window shows you how much detail is currently on view and you can choose to hide certain features or road types.



Above SignPost lets you alter all the calculation values to suit your own needs.



Above The Itinerary window with detailed directions on the planned route. You can tell how long each stage will take along with how much it's costing.

Above Create a database that allows you to easily and quickly locate places by company name. You can include full contact details and tie a company to the Map.

SignPost is an automatic route planner that will generate maps and instructions on how to get from A to B (via C, if necessary). It'll run on all Macintoshes, including PowerBooks and is incredibly simple to use. Best of all it's extendible—you can buy additional country modules to suit your travelling needs both in Europe and the US (see sidebar). This includes the ability to plan a route from country to country.

Begin by choosing a starting location and a destination, SignPost will then work out the shortest, fastest or cheapest route. View the route directly on the Map or as an itinerary of directions ready for printing, click on the listing to see that point on the map. You can set preferences to customise how SignPost calculates the cost or the speeds to suit your vehicle.

SignPost is ideal for business people, it includes a companies module which lets you create a database of companies, addresses, contacts and their locations on the Map. You can then plan your route using company names rather than places. For instance Apple Benelux uses SignPost to quickly answer a customer's 'where's the nearest Apple Reseller?' query. They can quickly find it and fax a customised route description to the caller!

Additional Country modules include: Benelux, Eastern Europe, Europe, France, Italy, Germany, Scandinavia, Spain & Portugal, Switzerland & Austria and the United States. SignPost is PowerPC Native.

SignPost SRP £99 (inc UK Map)
Additional Modules SRP £59 each.

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The Finder

MACFORMAT

Welcome to another issue of MACFORMAT, Britain's best-selling Macintosh monthly. Whether you're an old hand or a newcomer, we'll keep to up to date with the news, reviews of interesting and affordable products, and tips and techniques to help you get even more out of your Mac, whatever you use it for!

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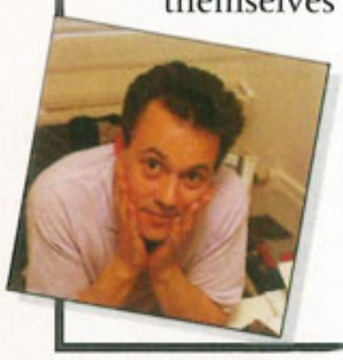
Trapped by Colour? 56
The last black art of desktop publishing is colour trapping, that is, overlaying colours correctly so that there are no gaps when they are printed. We explain how to get it right!

Looping the Loop 60
HyperCard may be simple, but there are times when you need the power of good old fashioned programming techniques. We show you how

Upgrade your RAM 64
As software gets more and more memory intensive, upgrading your RAM becomes essential. Follow our step-by-step picture guide and save yourself money!

Mac Answers 66
This is the part of the magazine where our experts devote themselves to answering all your real life Mac problems



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How to commission, select and crop photographs – our guide for producing small publications

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More powerful PowerBooks; more details on the new System software; colour PostScript for StyleWriters; and every other Mac-related story from around the world

Apple Talk 24
This is the part of the mag where you get a chance to tell the world what you think about any Mac related issue

What's New 26
Andy Storer looks at the products and events which have caught his attention this month, including the glories of the PowerMac and the idiosyncrasies of a new route planner

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Buying Advice 108
Whether you're buying by mail order or in person, it helps to understand your rights

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Is your MACFORMAT collection lacking that one special copy? Well, stop in at the Back Issues page and order your copy now – but hurry, they're selling out fast!

Next Month 113
Take a bit of artistic licence, and find out what's coming in the next issue of MACFORMAT

Win! Win! Win
There are so many competitions this month – and this is your chance to win

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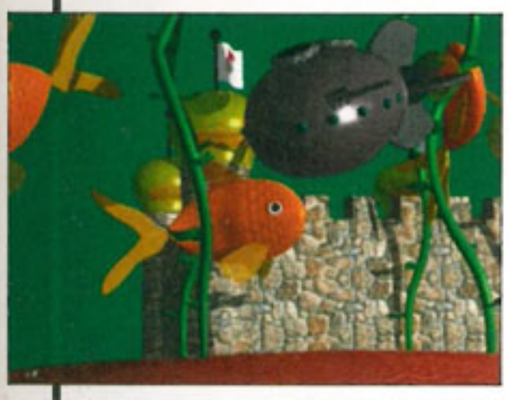
REVIEWS

HyperStudio 40
We review *HyperStudio* and check out just how easy it is to create your own multimedia production – and you can try it out for yourself with our cover disk demo



Ray Dream Designer 74
We test Ray Dream's innovative, new 3D image creation package, and discover a Virtual Dream for graphic designers

Helix Express 78
Relational databases may be a closed book to you, but if you want more power to your fingers, check out what this mighty new system could do for your computing power

The Cruncher 80
A talking spreadsheet for kids? Eh? But could *The Cruncher* be powerful and easy enough for mainstream use?

Shareware Heaven 89
We scan the Internet to bring you reviews of the latest crop of shareware and freeware offerings, including:

- Calculator 2
- Early Bird
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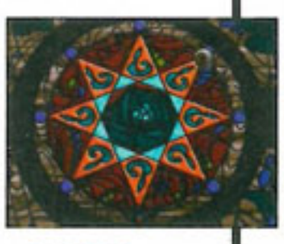
Flying Nightmares 96
The very first game specifically programmed for PowerMacs and, surprise surprise, it's a flight sim

7th Guest 98
The long awaited CD-ROM extravaganza finally makes its debut. Does it live up to the hype?



Deliverance 100
A hack and slash platform arcade-adventure? For the Mac? This has to be a first!

Populous 2 102
The sequel to the game that only came out a few weeks ago! But is this god sim any good?

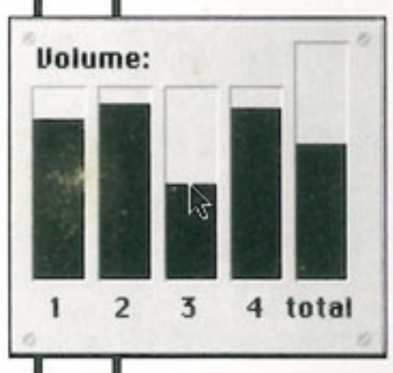
Spaceship Warlock 104
The CD-ROM classic has been re-released at budget price. But is it showing its age?

Datebook Pro 109
Can Aldus's new personal organiser really revolutionise your life? Or even just help a little bit?

FEATURES

Multimedia 31
The CD-ROM revolution, forecast for so long, has finally happened – and multimedia is once again the buzz-word of the hour. But what exactly is it? And how can you get involved? In our our massive 13 page feature, we tell you exactly what it is, what it can do, the Mac kit you'll need to join the multimedia revolution, and how to create your own all singing, all dancing presentations. We also put *HyperStudio* through its paces on page 40, and bring you a complete beginner's guide to CD-ROM on page 44

Get Natural 50
Creating computer art which looks like it was created with conventional 'natural' media is not easy. But in this new series we set out to show you how it can be done – and you don't need one of the specialist Natural Media paint programs to do it!

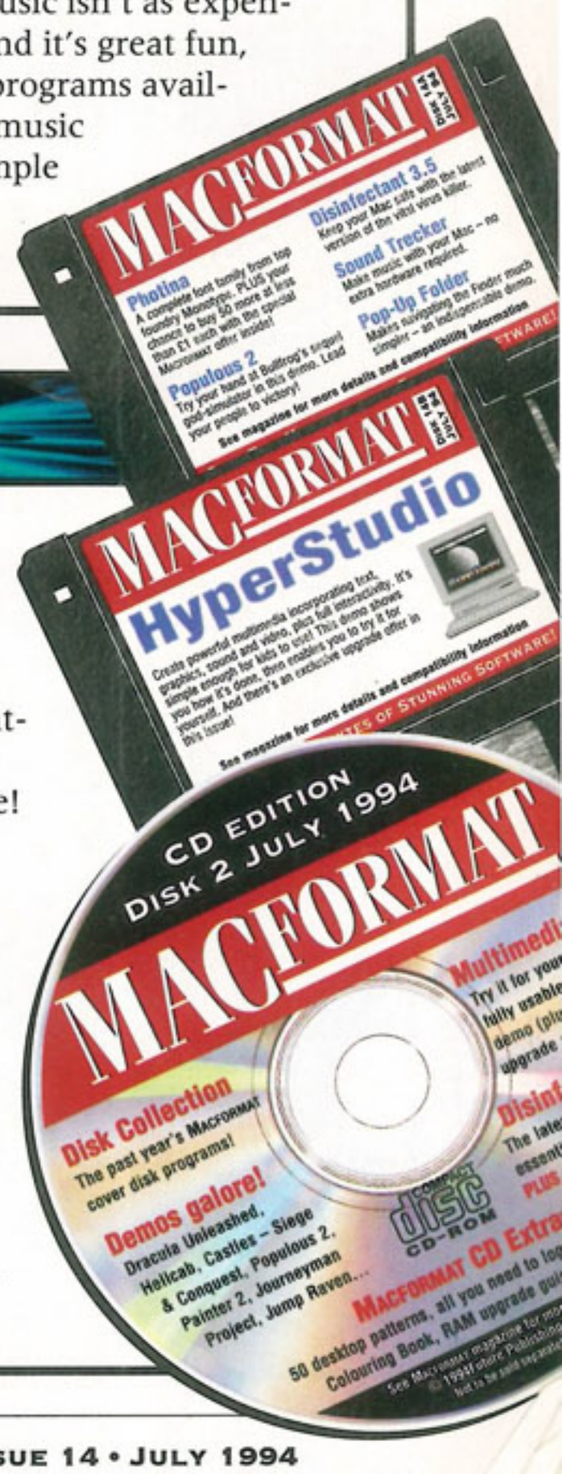


Music the Easy Way 82
Using your Mac to make music isn't as expensive as you might think – and it's great fun, too! We look at some of the shareware programs available and show you how you can create music without adding any hardware at all! Sample programs and music files are on the covermounted disk and CD-ROM

COVER DISKS

Your Cover Disks 6
Two disks this month, featuring a complete font family from Monotype, an exclusive demo of *Populous 2*, the very latest virus checker, your chance to create multimedia for yourself, and much more!

Your CD-ROM 12
If you've got hold of one of the limited edition versions of MACFORMAT with a covermounted CD-ROM, you have everything that's on the HD disk. PLUS CD-ROM demos including *Dracula Unleased* and *Castles*, and megabytes of extra software in MACFORMAT CD Extras.



Your Cover disks

Who says quantity and quality don't go together? We've searched high and low this month to bring you the crème de la crème of programs to pack *both* of your MACFORMAT cover disks.

Your monthly treats

Even more great stuff than usual this month thanks to not one but two disks. And of course on a limited number of issues there's the CD-ROM!

- *HyperStudio* demo – your chance to create your own multimedia!
- *Populous 2* – play God with our exclusive demo of this Bullfrog classic.
- Photina – a complete font family from top font makers Monotype. Includes roman, italic, bold and bold italic faces, complete and ready to use.
- *Pop-Up Folder* – try out this Finder enhancement utility.
- *Disinfectant 3.5* – protect yourself from the latest viruses.
- *Sound Trecker* – make music on your Mac with no extra hardware

Plus on the CD-ROM:

- *Dracula Unleashed* – could this be the best CD-ROM game yet?
- *Castles – Siege and Conquest* – play this sort of medieval *SimCity* from MacPlay.
- *Hell Cab* – a taxi cab journey into the underworld.
- *Digital Messiah* – a complete game! In the classic RPG mould, but with plenty of extra sounds and other enhancements.
- *Coloring Book* – a complete painting program for kids of all ages.
- The MACFORMAT CD Extras – megabyte after megabyte of top shareware for you to try and enjoy.

So, even more great stuff than usual this month – much more than any other magazine gives you!

START HERE

MACFORMAT's cover disk is a high-density floppy, so it can bring you more for your money. Almost all Macs made in the last four years (anything since the SE/30, including Classics and Performas) have a 'SuperDrive' which can read high-density disks, but older models don't and can't (that's Pluses, old SEs and original Mac IIs).

More than 4Mb of data

We spend hours checking all the programs on the MACFORMAT cover disk with as many different machines as possible, but we can't check every combination and we can't guarantee that the programs will work with your system. The information on compatibility in these pages is intended as a guide only, and we can't warrant the programs or be in any way responsible for any problems arising from their use or inability to use them. Check the 'Get Going' box just to the right for guidelines on installing any software.

Of course, some disks are occasionally damaged during the copying process. If you suspect yours is one of these, then please refer to the 'Faulty Disk' box on page 9.

BACK IT UP

Before you do anything else, you should make a backup of the MACFORMAT cover disk and work only with the backup, just in case anything goes wrong. Make sure the original cover disk is write-protected (move the tab so that you can see through the hole) – now nothing can be written to the disk. Then follow these simple steps:

1. Insert the MACFORMAT cover disk.
2. Highlight the disk icon (but don't double-click on it) and drag it over your hard disk's icon. The contents of the cover disk will be copied into a new folder on your hard disk called 'MACFORMAT July cover disk' (but not decompressed, so you still can't run anything directly).
3. When the copying finishes, drag the cover disk icon into the Wastebasket to eject it.
4. Insert a blank high-density disk. Check it's not write-protected, and, if need be, format it, naming it 'MACFORMAT July backup'.
5. Drag the 'MACFORMAT July cover disk' folder from your hard disk on to the new floppy disk's icon. When it has finished copying, your backup is complete.
6. You can now delete the 'MACFORMAT July cover disk' folder from your hard disk by dragging it to the Wastebasket.

GET GOING

Before you install any new software on your Mac you should ensure that you have a full backup of your hard disk, in case anything goes wrong, and that applies equally to our cover disk. Once you have backed up your hard disk, make sure you have no applications running, only the Finder, and insert the cover disk in your floppy drive.

Double-click on the disk's icon to open it; there will be two files. ReadMe contains information about the programs on the disk – double-click on it to read it. The other icon is the compressed file containing the cover disk programs.

We compress the programs into a single file so we can fit more on the disk, but before you can use them you must decompress the files. Double-click on the icon, and a dialogue box will appear which looks similar to the normal **Save** dialogue. Select the place on your hard disk where you want the expanded programs to reside, and click **Save**. After a few moments, the software will be installed on to your hard disk. You do not need to copy the files on the disk on to your hard disk before doing this.

Some programs may need further installation; check the ReadMe files which come with the programs for details.

POPULOUS 2 DEMO

Mac: any with 2.5Mb free RAM
Display: 16 or more colours
System: any

Back in February, in issue 9, *Populous* earned a MACFORMAT rating of 93%, and now Bullfrog has come out with the sequel. *Populous 2* is a 'god-sim'. You play god, and although you cannot directly control your followers, nevertheless you must influence them to become the most successful group on the planet. The game is reviewed this issue on page 102; here's your chance to try it for yourself.

How to play

The **World Map** gives you an overview of the world you're on, but you play on the **Close-Up Map**. To change your view you can scroll with the cursor keys or point to the World Map and click on the spot you want to view. The area you're viewing is marked with a white cross. Or, you can hold down the mouse button and scroll around the World Map.

Walkers represent tribes wandering the land seeking somewhere to settle. They will settle on any piece of flat land that can support them. When they do so, they build dwellings.

So, your first task is to create some flat land. To **raise** a square of land, move the diamond cursor to the centre of the square and press the [>] or [Z] key. To **lower** a square of land, move the diamond cursor to the centre of the square and press the [<] or [X] key.

To win a world, you have to create new settlements. These grow according to the amount of farmland around them – the more farmland, the bigger the settlement. The biggest settlements are **castles**. These increase your population fastest, so initially they're the most valuable. Castles are also more technologically advanced, and better weapons mean your people are better fighters. To create a castle, flatten the land widely around any dwelling.

As a settlement fills with people, its **flag** rises. When its flag reaches the top, the settlement is full. At this point, a walker automatically goes in search of a new place to settle.

Early on in the game, however, you don't want to wait for your settlements to fill up before releasing walkers. The more large settlements you have, the faster your population grows. So you can command a settlement to '**sprog**' or send some of the population out in search of a new home. To sprog a walker from a dwelling, point to the centre of a dwelling and press [<] or [X]. The diamond cursor must be on the exact centre of the dwelling.

The **Colosseum** is a population indicator. As populations change, the Colosseum fills and empties to reflect the fluctuating numbers of dwellers. Good populations (your worshippers) appear in blue – Bad populations (your rival gods' worshippers) appear in red. Compare populations often to keep track of how you're doing. The Colosseum can also be used to track walkers and settlements and get information on their strength and inventions.

The **Papal Magnets** are icons of worship for Good and Bad. The first of your walkers to encounter your Magnet becomes your leader. Convert strong leaders into special walkers called Heroes with your Papal Magnet. You can move your Magnet to Bad territory, then influence your worshippers to go to it and invade Bad settlements. However, you cannot place your Papal Magnet without a leader.

Your powers

The **Mana Gauge** measures your Mana – the reservoir of power you can use to perform Effects. The red line at the base of the Mana Gauge indicates your total Mana. The pointer shows which Effects you can currently perform. The more worshippers you have, the greater your Mana. At the start you only have enough Mana to raise and lower land. As your people multiply, your Mana increases.

Regardless of your Mana level, you have some **Basic Commands** which you can use to influence the general behaviour of your followers, or get information on populations and settlements. Use the **Influence Behaviour** Commands to control your followers. These are available on every world and can be used without cost to Mana.

- **Go to Papal Magnet**: Influence your people to find their leader and follow him to the Papal Magnet. You can always find the leader by clicking on this option. Use this option to draw your leader and worshippers together, then turn your leader into a Hero.
- **Settle**: Influence your walkers to build new dwellings and your people to reproduce. To encourage faster settling, 'sprog' worshippers from their dwellings by pressing [<] or [X] on a house.
- **Fight**: Encourage your walkers to attack Bad settlements and worshippers. Fight also encourages your people to settle and produce more walkers for battle.
- **Gather Together**: Encourage your walkers (each one representing a tribe, remember) to walk toward each other and combine into one stronger walker. This option also influences your people to settle as they come together.

Divine Intervention Effects

Since you're a god, you naturally have an arsenal of awesome powers and potent disasters at your disposal. There are six categories or elements, each with five individual Effects. These become available to you as your Mana increases. The Effects you can perform depend on which world you're fighting. In this demo, you have some People Effects and one Fire Effect. To switch between these kinds of Effects, click on the appropriate icon.

The Fire Effect available is **Fire Column**, which starts a huge column of fire that moves across the land. To use a Fire Column, click on the appropriate icon. A small fire column on the pointer indicates that the column is now ready to be set down. Move the cursor on the Close-Up Map and click to set the column down – it appears in a somewhat random location. As dwellings burn, your rival worshippers perish. Any land that the column moves across appears scorched and ruined. Your rivals have to raise or lower the ruined land in order to make it arable farmland again.

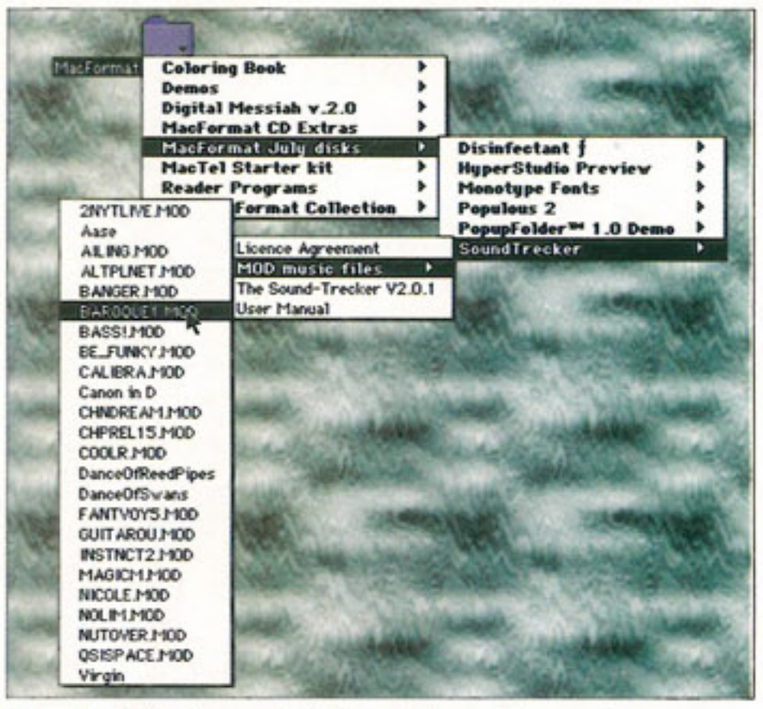
The People Effects include:

- **Raise** and **Lower** Land: as before.
- **Place Papal Magnet**: this enables you to place your Papal Magnet anywhere on the Close-Up Map. Click on this button, and then move your cursor to the Close-Up Map and click again.
- **Perseus**: this changes your current leader into the Hero Perseus, who marches through your opponent's land and destroys any settlements or people he encounters. Simply click on this button to call the Hero.
- **Armageddon**: this forces Good and Bad forces to fight until only one population survives. Only use this effect when your population is significantly greater than the enemy's.

Call your guys to the Papal Magnet and they'll join your leader inside a blue flame. Then when you think he's strong enough, click on Perseus to convert him into a havoc-wreaking hero.

When you have a significantly greater population than the enemy god, call Armageddon – and watch the scrap.

A typhoon will sweep the land sucking up both good and bad walkers, which it'll then dump in another part of the world. The walkers affected lose some of their strength.



Pop-Up Folder is a neat utility which enables you to see a hierarchical list of your folders's contents.

Pop-Up Folder

System enhancement demo
Mac: any
Display: any
System: System 7

The Mac's system of storing folders within folders is great for sorting your files into logical groups, but it can make navigating your way around them a fairly tiresome business. (It could be worse though – we could be typing

```
cd c:/files/dtastrg/mnthlyrt/april
```

or some such gobbledygook like DOS users.) As they say on *Tomorrow's World*, "But now, thanks to a neat utility called *Pop-Up Folder*, you can move things around very fast."

It works by making a hierarchical list of the contents of a folder appear when you hold the mouse button down over a folder for a moment. Look at the screenshot on the left to see what I mean, or even better install it on your Mac by dragging the *Pop-Up Folder* icon on to your System Folder and restarting.

Better still, *Pop-Up Folder* can make the lists in **Open** and **Save** dialogue boxes act like lists do in the Finder, with those little triangles, and it can make the **Apple** menu spring submenus. It certainly enhances the System nicely!

If you like *Pop-Up Folder*, the complete version costs £45.82 , and it's distributed by Softline on 081 401 1234, who will be able to tell you your local supplier. Watch for the full MACFORMAT review next issue.

Disinfectant 3.5

Freeware virus killer
Mac: any
Display: any
System: any

There's yet another nasty virus on the loose – there seems to be about one a month these days. You can't be too careful about viruses, which is why we at MACFORMAT make it our policy to bring you the very latest virus checking software available. We get it by direct connection to Northwestern University in the US, where a worldwide virus watch is kept. *Disinfectant 3.5* can find and kill all known viruses as of May 1994, so you can rest safe in the knowledge that your system is clean. Beware of using any versions before 3.5 – they will not pick up the new virus strains.

Photina

Photina MT

TrueType font
Mac: any
Display: any
System: System 7, or System 6 with TrueType INIT

Photina is one of a series of professional quality fonts created by the leading font foundry Monotype, which creates fonts for luminaries such as Apple. We've arranged with Monotype to give you this complete font family containing normal, bold, italic and bold-italic versions of Photina. It's not a demo version, there's nothing cut down about it and there's no shareware fee to pay. It will just make your fonts look more professional!

To install the font under System 7, just drag it on to the System Folder. It's a TrueType font and will work right away with any printer,

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MACFORMAT and top font maker Monotype have got together to bring you an exclusive font pack which is available only from us.

We've chosen 58 of Monotype's superbly crafted text fonts. These are genuinely useful fonts that you can use in documents to enhance them and make them truly unique, stylish affairs. You'll find no silly headline fonts here that you could only use in invites to a '70s bad taste party; it's 100% top notch main text fonts all the way.

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Bembo Bold
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Footlight MT Bold Italic
Footlight MT Light
Garamond MT
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This is Photina
This is Photina bold
This is Photina italic
This is Photina bold italic

Photina is a top quality font, and you're getting all four typefaces for free, gratis, for nothing – can't be bad eh?

inkjet or laser. And if you like it, there are another 50 in our exclusive MACFORMAT font pack, for less than a pound each! See the coupon on page 8 for details.

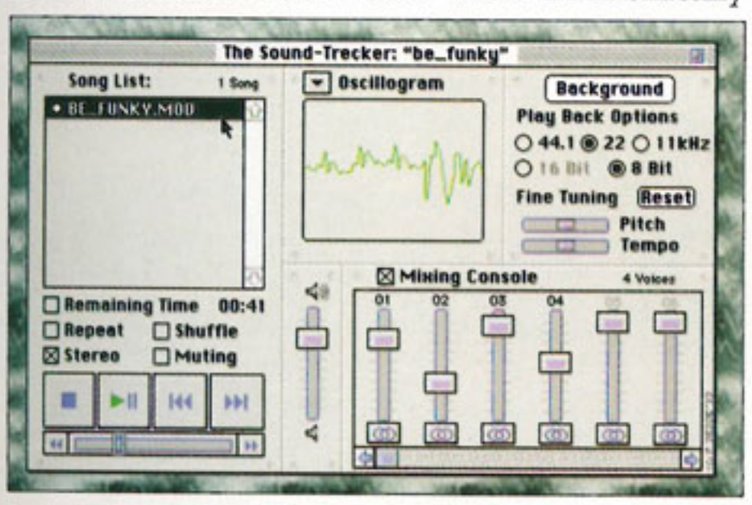
Sound Trecker

Shareware: $30
Mac: any
Display: any
System: any

Sound Trecker started life on the Commodore Amiga, where a music file format called 'MOD' files became popular. This system used samples of instruments which were then electronically processed to create different notes for use in musical scores. This made them much smaller – and made portable, editable music files a very real possibility.

Try playing the music files included on this month's cover disk (there are many more on the CD-ROM), and fiddling with the mix and the stereo pan.

For more information on *Sound Trecker*, check out the music feature on page 82, or read the comprehensive documentation on the disk.



The musical Mac: *Sound Trecker* plays all the tunes – you do the mixing. Get down to that funky rhythm – or something.

HyperStudio

Multimedia creation package demo
Mac: any
Display: colour
System: System 7

It almost seems pointless trying to describe *HyperStudio* – it can do a better job itself using the full power of multimedia!

If you've seen *HyperCard*, you'll be familiar with the basic concept of *HyperStudio*: 'cards' in a 'stack' which are linked by clicking buttons. But *HyperStudio* has a number of advantages over *HyperCard*. It's in full colour for one, and can incorporate video from a *QuickTime* movie or live from a camera (if your Mac can handle it) as well as sound from the Mac's microphone. But the best part of *HyperStudio* is that it's ridiculously easy to use.

Try it for yourself! It has seen a lot of use in US schools because creating genuine interactive multimedia with video, audio, text and pictures is now so easy that a child can do it with minimal training.

But this is not just a child's toy. You can create multimedia presentations worthy of software costing ten times as much, and all without doing any programming – it's all done by menus. If you want to get your hands dirty, there is a programming language, the educational language Logo, but you won't need it for creating stacks.

HyperStudio has add-ons technology, which speeds it up and enables you to easily add updates and increased functions. (See our review of *HyperStudio* on page 40 for more details.)

ABOUT SHAREWARE

Some of the software on the MACFORMAT disk is shareware. If after a fair trial period you decide to carry on using it, you are obliged to pay the fee specified in the program's documentation files.

FAULTY DISK?

When you duplicate as many thousands of disks as MACFORMAT does each month, unfortunately a few duds are bound to slip through the net. If you think you have one such lemon, read through the installation procedure on page 6 just to double-check that you're not missing something.

If the disk still won't work, we'll replace it for you. Just return it with a sturdy self-addressed envelope (a Jiffy bag is ideal) to: MACFORMAT June Disk, Discopy Labs Ltd, PO Box 21, Daventry NN11 5BU. Telephone: 0327 300077. Please do not send your disk to any other address.

EXCLUSIVE HYPERSTUDIO OFFER

We were so impressed with *HyperStudio*, and its ability to enable any Mac user to create their own multimedia, that we got together with the UK distributors TAG Developments to offer MACFORMAT readers an exclusive deal on the software.

We can offer you *HyperStudio* at a special price of £117 – that's almost £50 less than the recommended retail price. For just £117 you can be creating multimedia masterpieces in moments.

This offer is strictly time-limited, so apply now to get your copy at this price before it resumes its normal £165 price in a few weeks.

To get your copy, just phone our credit card hotline on 0225 822511 (9am – 4.30pm), or fill in the coupon below.

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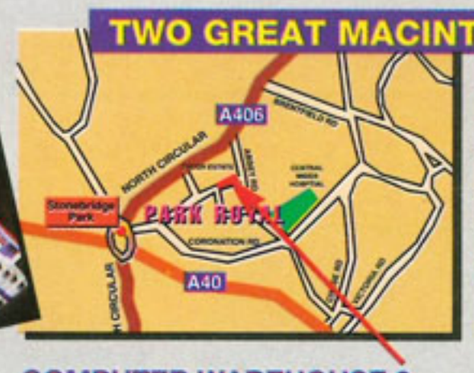
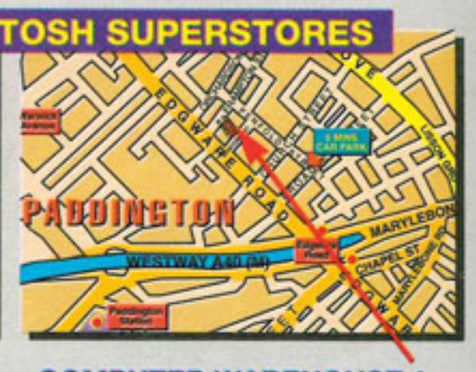


COMPUTER WAREHOUSE 2



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Pictured with optional 14" RGB Monitor & keyb.

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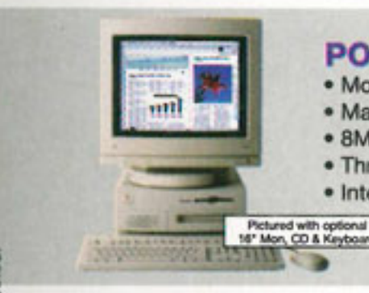

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VISA

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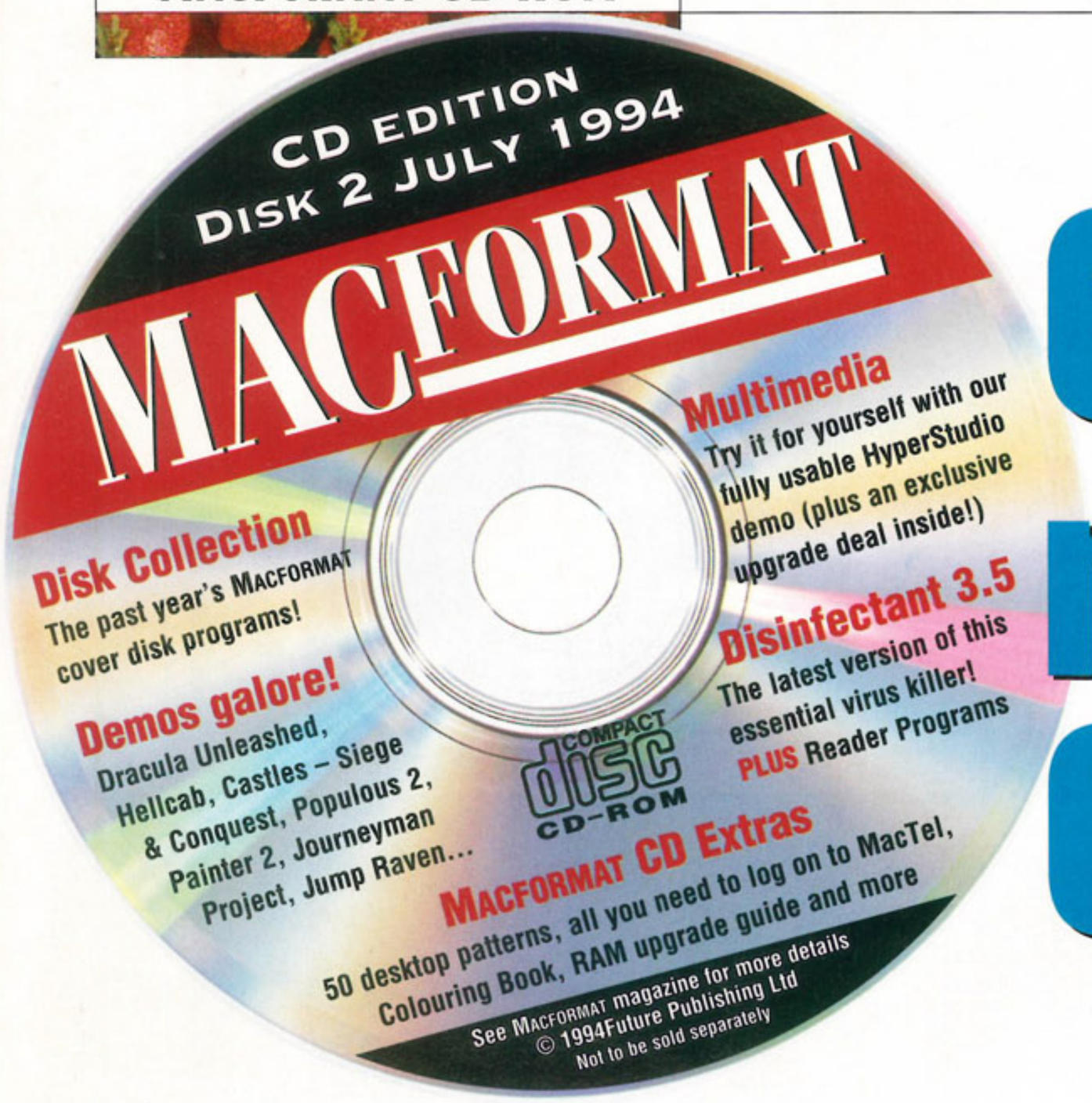


On this month's CD-ROM

There are a limited number of copies of MACFORMAT available each month with a covermounted CD-ROM. If you have a CD-ROM drive, and haven't managed to find a CD issue, either subscribe (see page 94), or order the CD edition from your newsagent. Larger high street newsagents are more likely to have stocks.

It's impossible to do justice to the sheer volume of programs and demos on the CD-ROM. The best thing to do is draw the curtains, turn the telly off and the answering machine on, and settle down for the evening to explore the contents for yourself. These pages show you some of the highlights.

For children we have the shareware program *Coloring Book*, which features a number of outline drawings which the child fills in, following the voice commands of the characters on the screen. It's all accompanied by silly sounds in the *KidPix* tradition.

Games fans have a wealth to choose from including the immense *Digital Messiah* (reviewed in this month's Shareware pages on page 89), a game originally intended for commercial release. Its gameplay is closer to *Gauntlet* than *Dungeons & Dragons*, and it has some great sound effects.

Also on the games front, *Breakout* fans have two of the best from France: *BeeBop* and *StarBop*. *Spheres* meanwhile is a puzzle game to tax even the most intelligent.

If you have a modem, you'll find the latest version of the *First Class* software, which will enable you to get on-line to MacTel, one of the UK's top Mac bulletin boards with a fully Mac-like interface – no type-in text commands!

Considering a memory upgrade? Check out *SIMMstack*, a *HyperCard* stack with everything you ever wanted to know about RAM, and the exact type you need for your Mac. (Turn to page 64 for our feature on upgrading your RAM.)

If you don't like having a boring grey desktop, you'll find plenty of options with the *Desktop Textures* installer which has no less than 11 volumes of patterns to choose from.

And that's not all – there's megabytes more shareware packed on to the CD, too!

FAULTY CD-ROM?

If you have a faulty CD-ROM, please pop it in a strong envelope and send it to:
Distronics, Southwater Business Park,
Worthing Road, Southwater,
West Sussex RH13 7YT.
We will then send you a replacement.

THE MACFORMAT COLLECTION – EVERY COVER DISK SINCE ISSUE 1

Using the vast storage power of CD-ROM, we've managed to squeeze every single cover disk since MACFORMAT was launched on to this one disc. We've even updated the software, where possible, to get the latest versions! On this CD you'll find:

- From April '93: *Lemmings*
- From June '93: *Spectre Supreme, Colour Floppy, SuperClock!*
- From August '93: *Arashi, BeHierarchic, Compact Pro, BiPlane, Seahaven Towers*
- From September '93: *Address Book, Ritz starter Accounts, Columns 2, Daleks*
- From October '93: *Greg's Buttons, Operation Intercept, Do It All!, PopChar, Bomb Shelter*
- From November '93: *Civilisation, Tetris 2000, Eclipse, STD*

Seahaven Towers first appeared on a MACFORMAT cover disk way back in August 1993, and it must be good, because our Production Assistant, Yolanda Hughes, is still playing it!

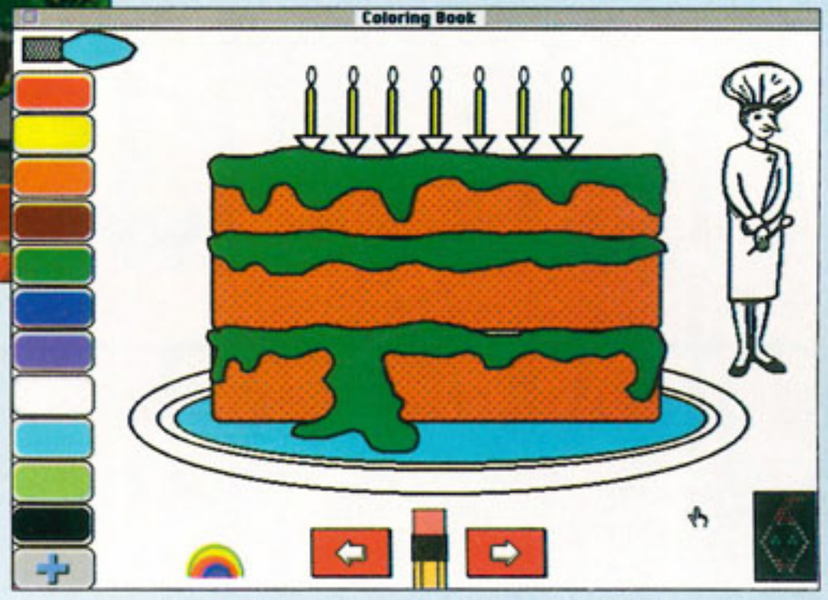
- From December '93: *Prophylaxis, ZipIt, SmartLaunch, Chuuzr, ICONOpen!*
- From January '94: *AutoRoute, Graphics Convertor, Maelstrom, NIH Image*
- From February '94: *SimCity 2000, Greg's Browser, Quark* XTensions
- From March '94: *Apollo*, 30 fonts
- From April '94: *SpeedyFinder 7, ResEdit, GNU Chess, Firefall, allDay*
- From May '94: *Prince of Persia 2* demo, *Scrapz, Symbionts, ColorKnit*
- From June '94: *Syndicate, Schuzzy, Guitar Tuner, Menuette*

and many, many more. We've selected the best programs from the cover disks of the last 18 issues of MACFORMAT. Software collections don't come any better!

CD-ROM DEMO CORNER

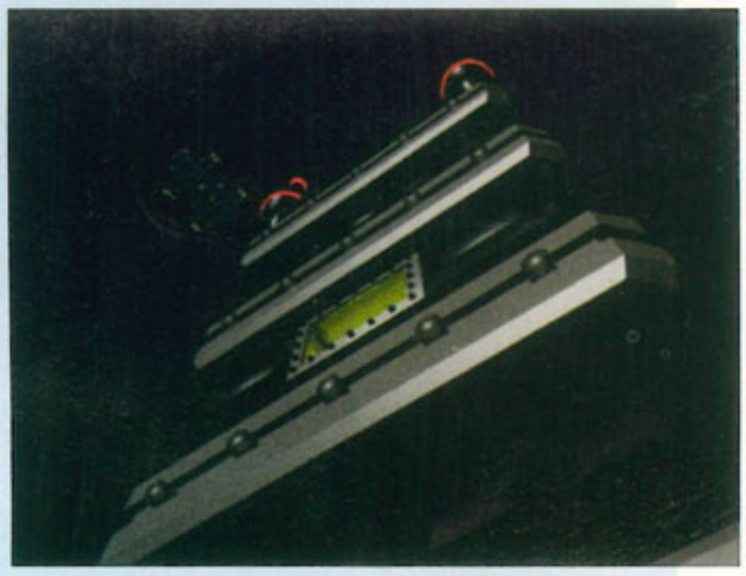
Fatty Bear: this is one of several educational programs on this CD-ROM – try before you buy!

Castles – Siege and Conquest: a great medieval strategy game from MacPlay. Try your hand at castle building in France! (Requires a 256-colour Mac, System 6.0.7 or better, plus *QuickTime*.)

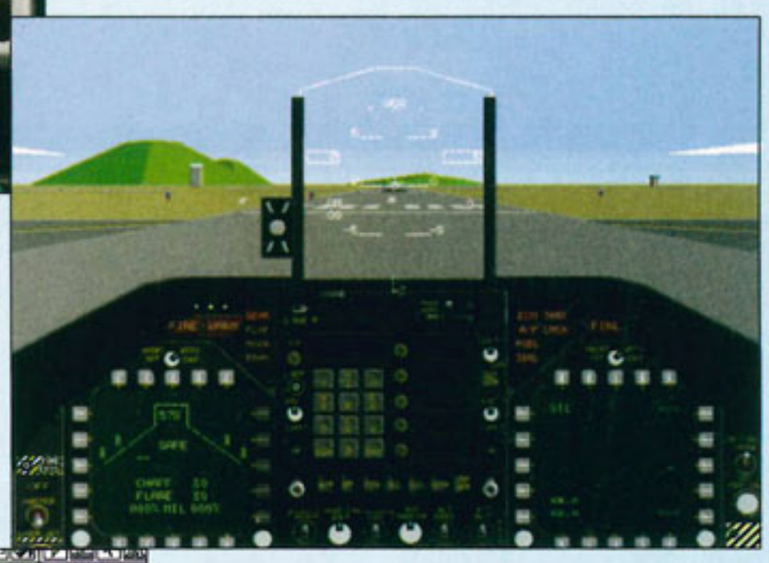


So, you want something to keep the kids quiet? Well, how about this? *Coloring Book* is a painting program especially designed for youngsters – but best of all, there's no chance of paint-spillages.

Jump Raven: a CD-ROM-based sci-fi adventure featuring 'digital puppets', from the makers of *Lunicus*.



Journeyman Project: this CD is reputed to have the best graphics around – now you can make your own judgement. (Requires a colour Mac with 5Mb RAM and 13-inch monitor, plus *QuickTime*.)

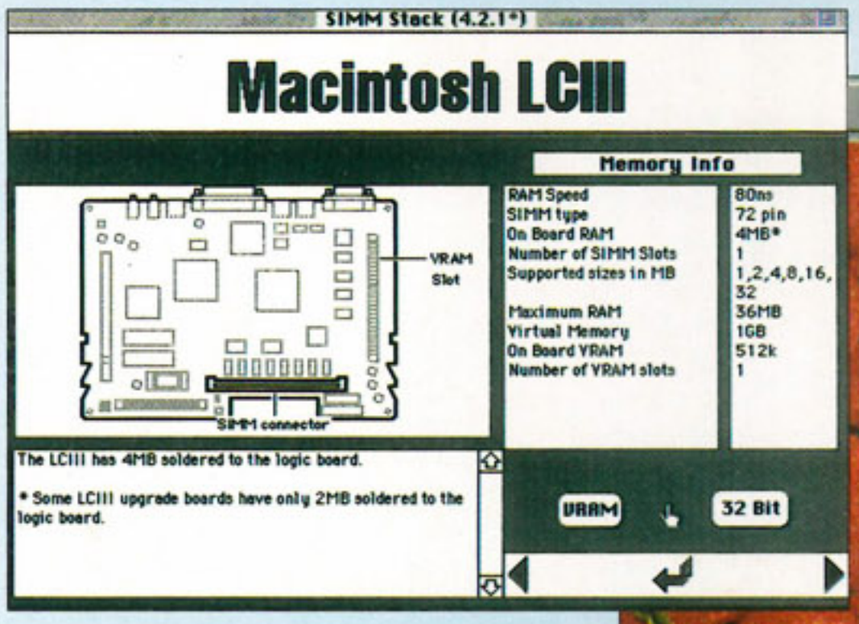


FA/18: hailed by some as the ultimate flight simulator. Now you can try it for yourself!

Dracula Unleashed: this brand new adventure promises to be the closest we've yet got to a real interactive movie. See for yourself...

Painter 2: try your hand at the Natural Media paint program. Just the thing for experimenting with the techniques covered in MACFORMAT's new Natural Media series, starting this issue on page 50.

SIMMstack is a brilliant *HyperCard* stack which features everything you need to know in order to upgrade your particular Mac's RAM.



Letraset Digital: not just one program, but demos of the whole range of Letraset's products, including *Sketcher, Typestry, LetraStudio, Phototone Textures, Custom Graphics* and much more.

HellCab: a cabbie from the supernatural world wants your soul for the fare – I wonder what he'll want as a tip?

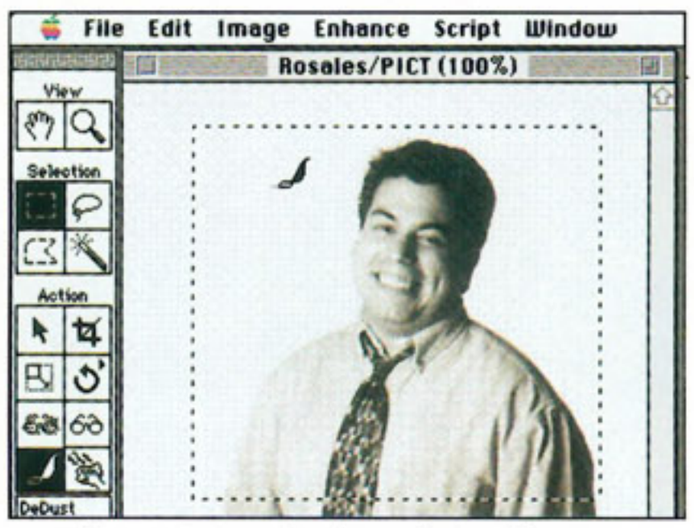
A simple demonstration of PhotoFlash software.

(A complicated demonstration isn't possible.)

1. Find a photo

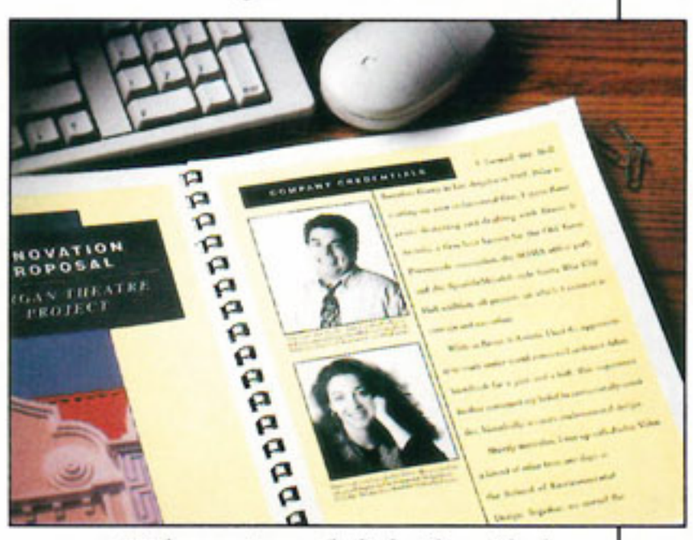
The PhotoFlash Browser makes it easy to view and pick photos—they're all stored here, whether you got them from a CD, scanner or digital camera.

2. Enhance it



Crop, rotate and resize a photo with easy-to-use tools. Dust and scratch removal is automated. And you can instantly preview adjustments you've made.

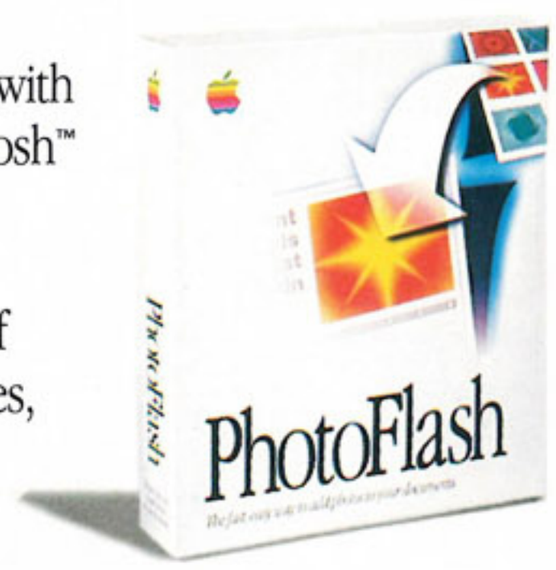
3. Place it



With a point and click, PhotoFlash automatically places the picture in your work. You can also record and automate the tasks you do most often.

You used to have to learn a lot—and spend a lot—before you could work with photographs on your Apple™ Macintosh™ personal computer.

Now there's PhotoFlash.™ PhotoFlash is easy to use, right out of the box. It helps you organise pictures, enhance them and drop them into your work.



It's fast. It's memory efficient. It's very capable. And it costs just £175.* So if you want to make your work look great, get PhotoFlash. You'll get the picture right away.

PhotoFlash is available at your Apple Authorised Reseller—for the name of your nearest Reseller, call the Apple Information Centre free on 0800 127753.

It does more. It costs less. It's that simple.

Apple

© April 1994, Apple Computer, Inc. The Apple logo is a registered trademark, and Apple, Macintosh and PhotoFlash are trademarks of, Apple Computer, Inc., registered in the US and other countries.

*Apple Suggested Retail Price as at 1st April 1994, excluding VAT at 17.5%. Apple Authorised Resellers are free to set their own prices.

System requirements: System 7.0 or later software, Apple Macintosh with 68020 or faster processor, 8MB RAM, 5MB of available hard disk space.

The 500 series offers users 68040 power at a very competitive price

Quadra speed at last for PowerBook range

Apple is now shipping the latest, fastest, and possibly the last, 68000-based additions to its PowerBook range – the 68040-based 500 series.

The four machines comprising the family – the 520, 520c, 540 and 540c – feature 9.5-inch displays, high speed Ethernet networking, built-in Processor Director Slots and optional expansion modules for PCMCIA cards. In addition, each model includes full 16-bit CD-quality stereo sound with built-in stereo speakers and a microphone.

They share the same design and casing as existing PowerBooks, save for one significant enhancement – the trackball controller has been replaced by a TrackPad. This is a pressure sensitive pad which enables the user to move on-screen cursors by fingertip control. A further difference between the 500 series and existing models is the provision of longer battery life via the PowerBook Intelligent Battery. This offers up to three hours of use between two hour recharges.

While purchasers will pay a premium for Quadra performance on the road, it remains to be seen just how well the new PowerBook 500 series will actually sell, given the inevitable launch of RISC-based PowerBooks in the New Year (see the story on page 19). However, the power user who can't bear to wait that long, will be pleased to learn that each of the new 500 series portables will be upgradable to PowerPC once the new 603 logic boards are made available.

Meanwhile Apple has pitched its prices aggressively – with the 520 coming in at £1,857 – to make headway into the lucrative, but over-crowded PC portable market.

The range is differentiated by processor speed and display quality – see the table for details. The PowerBooks are available now. For more detailed information call Apple on 0800 127753.

Those PowerBooks in full...

	520	520c	540	540c
Model:				
Processor:	25 MHz 68LC040		33 MHz 68LC040	
Display:	Greyscale	Dual scan colour	Active matrix greyscale	Active matrix colour
Video:	16 shades of grey	256 colours	64 shades of grey	256 or thousands
Hard drive:	160Mb	160Mb	240Mb	320Mb
Weight:	6.3lbs	6.4lbs	7.1lbs	7.3lbs
Price:	£1,897	£2,438	£2,656	£3,977

Mac sales soar as Apple cuts Performa prices again

As if you needed any further proof that you're the proud owner of a machine that's going places, Apple's latest sales figures show that since it's been selling machines through high street stores, the company has cleaned up.

Macs and Performas can now be bought in over 1,200 outlets around the country; this is a rather different picture to that of only 18 months ago, when Apple kit could only be bought in AppleCentres. The move, coupled with a radical re-pricing strategy and direct mail order, has led to the Mac doubling its market share in the UK to 8.5%.

And this growth could go even further as Apple announced further price cuts in the Performa range. The Performa 450 (otherwise known as an LC III) will now cost £799 including monitor and *ClarisWorks*. The faster Performa 475 (a rebadged LC475) with its '040 processor can now be had for just £899.

Contact Apple on 0800 127753.

PostScript for Colour StyleWriter

StyleScript is a utility which offers PostScript Level 2 output to users of Apple's new Colour StyleWriter.

Adobe's PostScript page description language is the most powerful imaging model for describing the appearance of complex pages with integrated text, graphics and images, and radically improves the quality of printed type. Coupled with a £645 Colour StyleWriter Pro, *StyleScript*, which'll cost in the region of £147, provides an economical solution to high quality colour output. More information from Academy Software on 081 656 9560.

■ GDT Softworks has more good news for Mac owners who are looking for colour output. The company has just announced *PowerPrint 2.5* – a suite of printer drivers opening up colour and greyscale support for all leading PC-compatible printers. Bundled with a high-speed serial to parallel adaptor cable, *PowerPrint* at £159 can be used to connect the Mac to over 1,000 PC printers with no built-in AppleTalk connectors.

12 bits more

Mac owners looking for the ultimate in colour scanning should check out MicroTek's ScanMaker III, the world's first 36-bit (4,200 million-colour) desktop flatbed scanner.

Boasting a resolution of up to 2400 x 2400 dots per inch, ScanMaker III uses a colour charged coupled device, as found in video cameras, to rapidly acquire photorealistic RGB colours in a single pass. This leading edge technology will cost you £3,500. So, if you've got a few grand sitting in your back pocket, call Computers Unlimited on 081 200 8282 for more details.

Enter the Net now!

US Robotics has slashed the price of its popular Sportster 14,400 fax modems by a third and added a five year warranty and free lifetime technical support into the bargain.

For only £234, you can buy the Sportster Mac & Fax with bundled fax and communications software to send and receive faxes direct from your desktop and join the online Mac community. The modem supports all the common protocols and is directly supported with zero set-up by most communications programs.

More information from US Robotics on 0753 811180.

Nightmares wanted

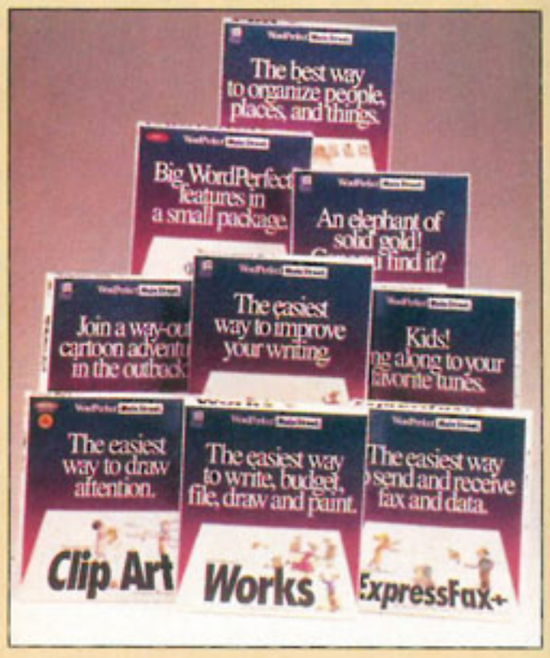
Fancy a free holiday in California in September? All you have to do is write 1,000 words on your worst computer nightmares – you know, crashed hard drives, exploding monitors – that sort of thing. The San Diego Computer Fair is offering the trip to the US to the best entry it receives by Friday 29 July. Send your hard luck story to Computer Nightmare Contest, PO Box 83086, San Diego, CA 92138.

WordPerfect budget range streets ahead

WordPerfect has launched its budget Main Street range of products aimed at the areas of personal productivity, home education, edutainment and infotainment. Priced between £29 and £79, the packages in the range include *WordPerfect Works*, *Clip Art for the Office* and *LetterPerfect*.

Works comprises a word processor, database, spreadsheet, comms package and paint application – all for £79. *Clip Art for the Office* offers 400 images for graph documents, letters and presentations; a sister title, *Clip Art for the Home* offers a further 400 images. The images in both are vector-based, meaning they can be resized without any loss in quality, and come in PICT format, thus ensuring compatibility with most Mac applications. Both collections cost £29. *LetterPerfect*, a £39 cut-down version of the best-selling *WordPerfect* processor, gives users most of the latter's features at less cost and with less memory overhead.

More information from WordPerfect on 0932 850505.



The Main Street range cuts the cost of WordPerfect software.

New Duos get extra speed and colours

Apple has announced two additions to its Duo range of dockable notebooks which combine even greater power and portability with innovation. In fact, they're the fastest portables to date.

The 280 and 280c both feature fast 33MHz 68LC040 processors, 16-bit screens, increased battery life and upgradability for existing Duo 210, 230, 250 and 270c owners. Priced at £2,214 and £3,090 respectively, the 280 and 280c both feature active matrix displays. The 280 offers 16-level greyscale, while the 280c can display up to 65,000 colours. Perhaps the best feature, though, of the new machines is the weight: both top the scales at under 5lbs, with the 280 coming in at only 4.2lbs.

A new Dock – the PowerBook Duo Dock II, costing £870 – enables the notebooks to take advantage of a desktop housing with built-in support for Ethernet and for 21-inch displays, extended keyboards and NuBus expansion slots. In addition, 16-bit colour is supported on up to 16-inch monitors, and existing '030-based Duos can be connected to the new Dock II. They can also take advantage of its built-in Floating Point Unit and 32K cache for a claimed performance increase of 25%.

Faster, more colourful and encased in a featherweight casing – can't be bad!

Existing Duo owners will be able to upgrade to the new logic board for around £700 and, in effect, upgrade to a PowerPC processor, since Apple will offer 603 upgrades for the entire Duo range next year. In sheer performance terms, the Duo 280s run about 10% faster than the latest top-of-the-line PowerBook – the 540c (see page 17) – because they use the full data transfer capability of the 32-bit system buses, making them the fastest portables Apple has ever made.

More information from Apple on 0800 127753.

Links Pro is so beautifully presented, you can almost see the grass growing.

Links Pro tees off

The Macintosh will shortly have a new golf simulator available which, if the screenshot shown above is anything to go by, looks like it could set a new standard in graphic realism.

Links Pro from Access Inc is designed to run on PowerMacs, though it will happily run on any colour machine. It features high quality landscape rendering including hills, rippling streams, wispy clouds and even pools with ripples moving across their surfaces. Users can choose to play each other over *AppleTalk* or via modems thanks to *Links Pro's* built-in networking.

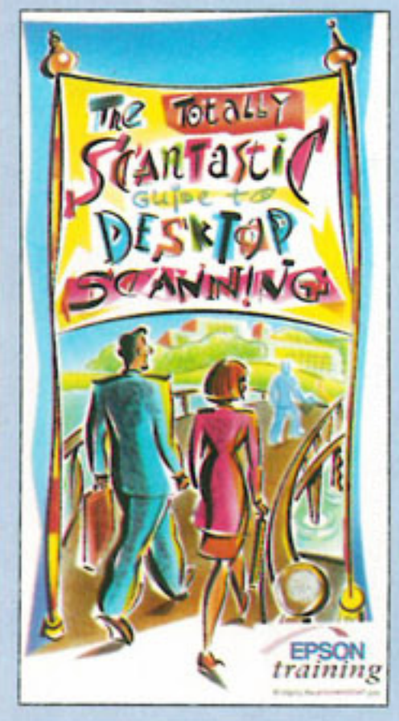
The game is a compelling simulation of the leading US golf courses, with new data modules planned to be delivered every three months. Multiple views, instant replays, a commentary and a host of realistic sound effects complete the game which, according to our sources, is all set for a June release. PC owners will recognise it as *Links 386 Pro*.

More information on *Links Pro* is available from Access on 0101 801 359 2900.

More power for PowerMacs

If you've just bought a PowerMac 6100 and fancy even more power to your elbow, you can now purchase a user-installable upgrade which will speed up the 6100's processor to the rate of the 80MHz PowerMac 8100.

KS Labs in the States (0101 614 374 5665) is offering the Alacrity PM 6100 – an oscillator and fan combination which simply clips on to the 6100 chip – for the amazing price of only $165. Not a bad price for a 25% increase in performance. No information on a UK outlet yet.

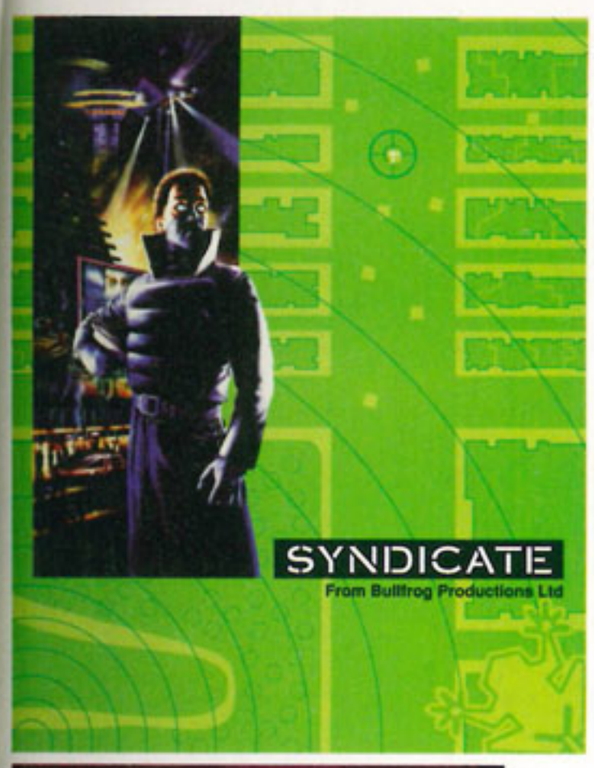


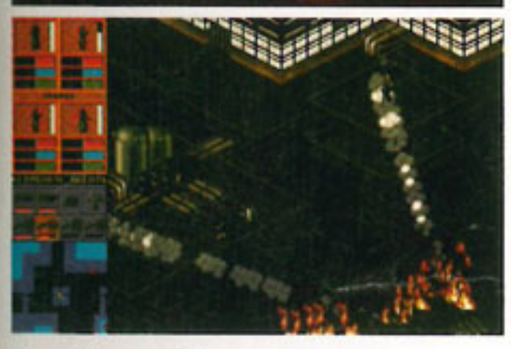
Free scanning book from Epson

A free illustrated guide to buying, using and perfecting desktop scanning is now available from Epson UK. *The Totally Scantastic Guide To Desktop Scanning* covers all forms of scanner technology, including sections on optical character recognition, image display and colour printing.

So if you fancy a freebie, write to Epson at Campus 100, Maylands Avenue, Hemel Hempstead, Herts HP2 7TJ or call on 0442 61144.

GOD CREATED THE





Syndicate™
Hi-tech cyberpunk action in Bullfrog's dark vision of a violent future. Global domination is the goal and the cities of tomorrow your battleground. Tool up your cyborg agents and spread the dark stain of your Syndicate from the barrel of a gun.
"Syndicate is a stonking game with a very tight plot, superb graphics and sound, and lashings of futuristic violence" **92%, MacFormat, June 1994.**

PowerMonger™
Rampage through uncharted lands and swell your ranks with recruits from conquered villages. Only the PowerMonger decides when to make peace, and when to hack his enemies into pieces.

BUT

BULLFROG™

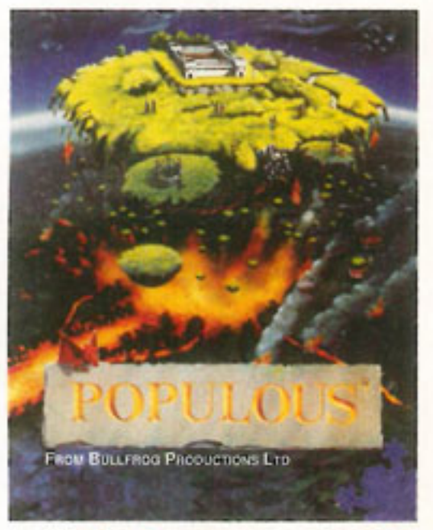
CREATED GOD.

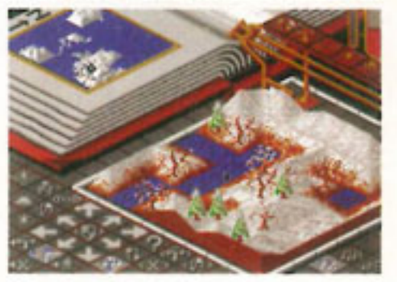
From Bullfrog, the originators of the God Sim, a range of titles designed to perfectly complement your AppleMac's abilities. Acknowledged as classics across multiple formats, now it's your turn to play God, dominate the world and shape the lives of multitudes.

With games like these, you'll discover the true meaning of control.

BULLFROG™
PRODUCTIONS LTD

Theme Park™ Designer Series™
It's about thrills, spills and paying the bills as you design, build and run the world's ultimate tourist attraction. Construct rides, respond to the whims of your customers, and fend off unfriendly takeover bids as you fight for supremacy against 40 rival Theme Parks.





Populous®
The original God Sim pits good against evil, with you as Supreme Being raining disasters down upon your enemies. Once you've played God for a day, you won't want to stop.

The Bullfrog Mac range of products is distributed in Europe by Electronic Arts, 90 Heron Drive, Langley, Berkshire SL3 8XP. Tel: 0753 546 465 • Populous is a registered trademark of Electronic Arts Ltd. • PowerMonger and Syndicate are trademarks of Electronic Arts Ltd. • Theme Park, Designer Series and Bullfrog are trademarks of Bullfrog Productions Ltd. • Electronic Arts is a trademark of Electronic Arts Ltd. • Mac and Macintosh are registered trademarks of Apple Computers, Inc.
EA DIRECT

Apple Direct closes down

Apple is ditching its direct mail order channel, set up only last November, in the face of competition from other dealers and mail order outfits. Despite expecting to achieve sales of as much as 15% of Mac shipments, Apple Direct just couldn't compete against companies which were undercutting its prices by at least 10%. Warranties on all goods remain unaffected.

Elsewhere in the retail channel, Apple dealer Creative Media Group is to sell Macs at cost price. There is a catch, though – you need to pay a £499 advance fee up front, then for the next year, you can buy up to £20,000 worth of kit at substantially reduced rates. More information from CMG on 0427 668800.

And finally...

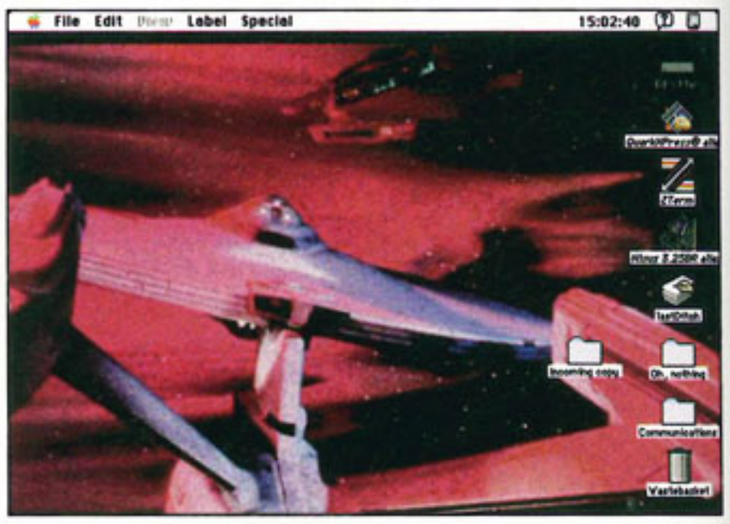
Leading UK publisher MDI is readying three new CD-ROM releases for imminent launch with *ITN World News '93* topping the list of multimedia extravaganzas. The disk, which features over one gigabyte of international news footage, will be bundled with its '92 predecessor to give Mac owners an easy-to-use insight into the events that shape the world. Also in the pipeline are *Behind the Scenes: The Zoo*, a double CD pack telling the story of the day-to-day running of Marwell Zoo, and *Ghosts*, an interactive tour of a haunted castle. For details call MDI on 0252 737630.

Digital pictures on CD-ROM

Kagema's PhotoLib series of CD-ROMs should have something for all Mac owners who want to enter the world of digital photography. The company has released 30 new CDs, each containing between 100 and 330 24-bit images of just about every subject you can imagine. As a taster, you can buy its PhotoLib *GO!* CD. The disc, which costs £41.70, contains 100 copyright-free images, and thumbnails of 16,000 shots from its other titles. For a full catalogue contact Kagema on 081 532 1515.

It's a screen saver, Jim

Softline has released *Star Trek Screen Posters*, a collection of slide-show screensavers showing scenes from both the TV and movie series. For £19.99, you get a disk featuring *Star Trek* characters, starships, Klingons and battle action as well as behind the scenes photos and images from promotional movie posters. The *Screen Posters* are all full-colour still images which can be easily used as backdrops for your monitor; they can also be password-protected to discourage prying eyes while you're away from your Mac. More information from Softline on 081 401 1234.



New System upgrade due on August 1st

The next revision of System 7 will be the most far-reaching to date, with Apple delaying its release until Monday 1 August to ensure all its components will be in position and bug-free. System 7.5 looks set to supersede System 7 Pro, the interim enhancement which included AppleScript and PowerTalk, by also directly integrating *QuickTime 2.0*, *QuickDraw GX*, *PC Exchange* and *Apple Guide*.

These six main features accompany minor enhancements to networking performance and hard drive control which, all in all, should provide significant improvements to the speed, display and ease of use of future Macs. Upgrades to 7.5 will be made available to all current users, though no price has been fixed as yet.

Although 7.5 was due to be released this spring, it is believed delays in implementing *QuickDraw GX*, the new System level code which handles both screen rendering and printing, has forced Apple to put back the launch date. While both *AppleScript* (an engine for automating file management tasks via macros – in essence, providing a scriptable Finder) and *PowerTalk*, (an architecture providing open collaboration with other platforms) have appeared on PowerMacs, 7.5 will include improved versions.

All Macs will be able to display full-screen video clips

QuickTime 2 – which will enable all '030 and '040-based Macs to display full-screen video at 15 frames per second and provide direct support for MIDI – is perhaps the most eagerly awaited component. Apple itself, though, is equally excited about *AppleScript*, as it provides the basis for its long-term goal: OpenDoc. This is a document creation system which enables users to create items such as graphics and charts independently of a host application with a series of common desktop tools.

Users will also be treated to *AppleGuide*, a revolutionary monitoring system which keeps track of a user's actions and suggests more efficient ways of achieving the same tasks; it will also guide you through new procedures. Finally, for users with both desktop and portable Macs, automatic file synchronisation between the two will be possible, so that regularly-used applications, like appointment schedulers, will be updated upon connection. For more information call Apple on 0800 127753.

PowerMac native releases begin to come through

Since Apple launched its PowerMac range on Monday 14 March, it's sold more than 150,000 units. There are now over 50 applications converted to run in native mode, with over 150 developers committed to the platform. Here are the latest arrivals:

Company	Product	Contact
Alias	*Sketch 2.0*	0101 416 362 9181
Casady and Greene	*Conflict Catcher II*	0101 408 484 9228
Claris	*ClarisWorks 2.1*	081 756 0101
Fractal Design	*Dabbler*	0101 408 688 8800
Macromedia	*Macromodel 1.5.2*	081 200 8282
Pixar	*Typestry*	0101 510 236 4000
Ray Dream	*Ray Dream Designer*	0101 415 960 0765
Specular	*Infini-D 2.6*	0101 413 253 3100
Virtus	*Virtus VR*	0101 919 467 9700

Prince finally released

Stocks of the sequel to the award-winning *Prince of Persia*, cunningly entitled *Prince of Persia 2: the Shadow and the Flame*, are now available. As the MACFORMAT demo version in issue 12 showed, your role is to once again defeat the evil Jaffar who takes the Prince's place, consigning him to the role of a beggar. With its lifelike animation, original music score and multi-plane scrolling, the new game looks set to win similar accolades to the original.

Prince of Persia 2 is available for £39.99 from Electronic Arts on 0753 549442.

'Power PowerBooks' ready to roll soon

Now that it's shipping its new '040-based PowerBooks and Duos, Apple is focusing its attention on readying a range of PowerPC notebooks for a January 1995 launch. The so-called Power PowerBooks are already under development in the States and will feature the new PowerPC 603 chips running at 66MHz and 80MHz configurations. Designed to offer workstation performance in a low-power consuming, compact unit with long battery life, the 603 only costs $199 in its 80MHz version – a price likely to drive the cost of entry-level notebooks based on the chip to below £1,500.

Apple has already said that it is to make 603 upgrades available for the new '040 PowerBooks and all Duos; these daughterboard replacements are expected to be cheap – perhaps as low as $500 in the US.

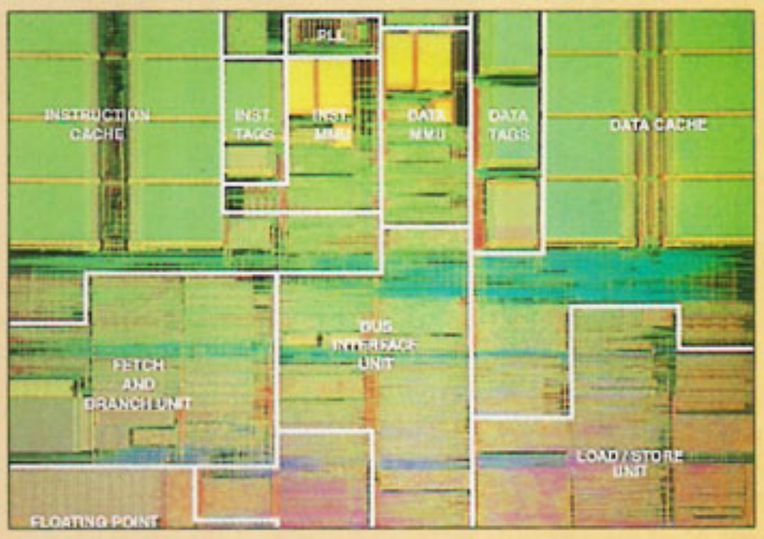
The company is rumoured to be developing a 603-based PowerBook which will feature a removable media drive, two PCMCIA card slots and an infra-red transceiver which supports LocalTalk.

PCMCIA slots, as used in the Newton, are becoming the standard way of attaching peripherals like modems to portable computers

But the move towards an entire range of Macs based on RISC technology is not fully complete yet. Inside sources say that Apple plans to launch one further PowerBook this autumn based on an '030 chip. Codenamed Jedi, the new PowerBook will feature a 33MHz '030, 9.5-inch 4-bit greyscale screen, 4Mb of RAM, a SCSI port and LocalTalk socket. However, it won't have a microphone, audio ports or an Apple Desktop bus port, and as such it will replace the PowerBook 145B and 165 for a cost reputed to be less than $1,200 in the US, with no UK figure mooted. However, it is possible that poor 145B sales in recent months will mean that plans for a very cheap PowerBook may be shelved.

New PowerPC chip races ahead

Motorola and IBM have completed the development and manufacture of the next generation of RISC chips – the PowerPC 604 (pictured on the right). Providing close to double the power and performance of the chip in the fastest PowerMac – the 8100 – the 604 will find its way into new machines which are to be launched next year. The secret of this unparalleled power is the fact that this processor packs over 3.6 million transistors into a chip the size of a stamp. Running at 100MHz, it is designed to run in 64-bit architecture The chip is intended for high-end desktop systems, mid-range servers and graphics workstations, so don't expect anything like bargain basement prices. Industry insiders further expect that by the time volume production begins at the end of the year, the speed will be increased to 133MHz.



How to feel chuffed

Here's some figures that'll get right up the nose of any PC-owning friends you may have. Independent research has shown that Apple's new PowerMacs trash Pentium PCs in all areas. The 8100 is 54% faster than a Pentium, the 7100 some 38% faster and even the 6100, rated at only 60MHz compared to the Pentium's 66MHz, beats it by 5%. US analysts, Ingram Labs ran a total of 25 tests on Macs and PCs running *Photoshop*, *FreeHand*, *Framemaker* and *Painter* to arrive at the figures.

Brit award

The British company behind the *SoftWindows* emulation software, Insignia Solutions, has won the Queen's Award for Export Achievement for the second year running. The company's overseas sales have more than doubled since its first PC emulation applications were brought to the market back in 1990.

Get in control of your contacts

In Control 3.0, the latest upgrade to the best-selling electronic organiser is now available from Softline.

Combining an easy-to-use outline with daily, weekly and monthly calendars, the new version adds more support for popular databases and contact managers. Recurring events can be entered automatically, while a sophisticated series of reminders will let you know, in advance, what you have to do and when you have to do it.

Drag and drop linking has also been added so that users can now cross-reference between schedules. In addition, the program includes access to phone numbers and addresses stored in *FileMaker Pro*, *TouchBase Pro* and *DynoDex*. *In Control 3* costs £118 and is available on 081 401 1234.

Colour system solves problems

The mismatch between the colours you see on-screen and their likely appearance in print (a traditional headache for any designer and graphic artist) has been eased with the introduction of a new colour matching system.

TruMatch seeks to finally end the process where designers have to wade through swatches of custom solid colour inks (half of which can't be matched in the four-colour process) to compare RGB colour with CMYK output.

Available as an add-in palette to popular programs from Adobe, Aldus and Quark, *TruMatch* replaces the familiar Apple colour picker with its own four-colour selector wheel, claiming accurate colour matching on output.

The software is available from TruMatch on 0101 212 302 9100 and costs $98.

Icon masters

Readers forever on the look out for new icons to grace their staid folders should look no further than the original designs from Gizmos. The princely sum of £7.50 will get you a disk containing over 200 custom-designed icons, which can be easily pasted on to any existing Mac icon – whether it's a file, folder or drive. Call Gizmos on 081 981 8281 with your order and brighten up your desktop.

Instant Art error

The review of Magnum Software's *Instant Art* CD in the June issue of MACFORMAT stated that the product cost £52.80. The correct price is £112. Our apologies for any inconvenience this may have caused. Contact Magnum Software on 0884 820240 for more details.

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All the fun of the fair

The Frankfurt Music Fair – the largest music exhibition in Europe – attracts exhibitors from all over the world, including most of the major music software developers. The Mac was extremely well represented – in fact, many developers were concentrating solely on Mac and PC programs. Steinberg, Emagic and OSC all announced software for the PowerMac.

One of the major trends now is direct-to-disk recording. All the major software houses had new or updated programs on show. One of the most impressive demos came from Emagic's *Logic Audio 2* (£225), a module which adds direct-to-disk recording to the *Logic* sequencer (£325). The latter contains a Groove facility which can take a piece of MIDI music, record in straight 4/4 time, for example, and alter the note lengths to make the piece really swing. *Logic Audio* was doing this with audio data! And doing it very quickly: it took only a few seconds longer than the length of the audio track itself.

Logic Audio also has an audio to MIDI facility which converts a single note guitar line (it's not polyphonic yet!) into notation. Altogether very impressive.

Logic itself has been upgraded to version 2 and now includes colour and support for *QuickTime* movies.

OSC announced *Deck II* (£410.08), another direct-to-disk system which supports eight tracks of digital audio. All Mac direct-to-disk systems require a sound card, such as Digidesign's AudioMedia II, but *Deck* will run directly on an AV Mac – albeit with only six tracks of audio. The combination of digital recording with a MIDI sequencer has to be the ideal setup for most users, which is why OSC's *Metro* sequencer (£249) has been designed to fully integrate with *Deck*.

Steinberg has upgraded *Cubase Audio* to v2.0 (£799). It supports an unlimited number of virtual tracks (limited only by the sound card) and includes a waveform editor and a graphic sound file manager. You treat the digital audio in the same way you handle MIDI data.

If you like messing around with digital audio, you'll love *Recycle* (£TBA), which can process audio data in various ways: you can alter the pitch and tempo of a sample loop, drop in new samples and apply a Groove (as in *Logic Audio*).

Opcode announced version 2.0 of *Studio Vision Pro* (£499.95), which adds 16 tracks of digital audio to the company's top-end *Vision* sequencer. It, too, includes Grooves and the latest version supports music notation. *Vision* includes an integrated universal librarian called *Galaxy*, which is useful, since editors and librarians for the Mac are few and far between.

This attractive domed glass construction is Die Galleria, the central walkway dividing the great music halls.

That said, it was nice to see *SoundSurfer* (£149) from Emagic, a universal librarian which can link to *Logic* to show the correct sound name in the arrange window.

Notation was another trend and most companies now see this as an essential part of a sequencer. Opcode's *Overture* (£449.95) is a professional notation system with tear-off palettes. It includes many features of a page layout program, such as the ability to scale any object, nudge notes one pixel at a time and support for EPS files.

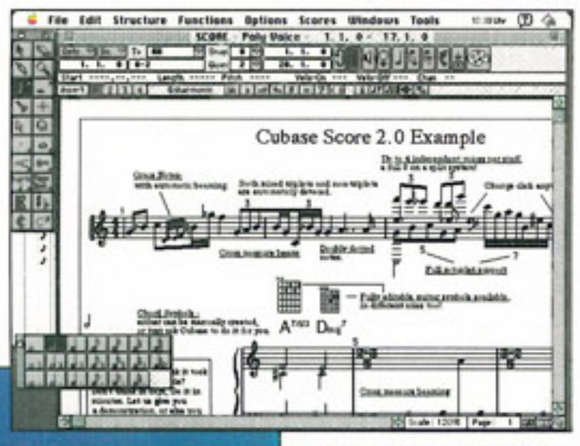
Steinberg's *Cubase Score* (£499) has reached version 2.0 and features over 100 music symbols, automatic layout options, polyphonic voices and a General MIDI setup. You can perform all the edits while the music is playing.

Passport is offering *MusicTime v2.0* (£199), a slightly cut-down version of *Encore*. New features include colour, note input from the QWERTY keyboard and a simplified program layout. For a limited time, it is being bundled with the *Trax* sequencer, which makes it a very good deal indeed.

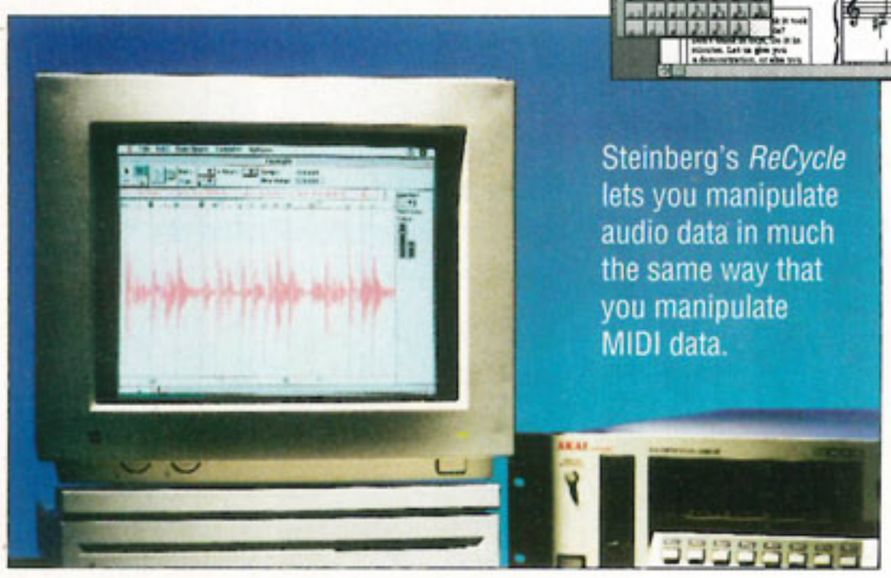
They may be boring old boxes, but let's face it, we all need a MIDI interface. One of the Mac's most annoying restrictions is only having two serial ports. Emagic announced the LOG2Mac (under £100) with one MIDI In and three Outs plus a serial port switch, which means you can leave a printer or modem connected to your Mac, then switch between it and the interface without unplugging. Opcode's Translator Pro (£129.99) has two MIDI Ins and six Outs and it also has a serial switch.

A MIDI keyboard is very useful for entering data into a sequencer, but if you're not a keyboard player, you may not want a full synthesizer. Several companies have produced controller keyboards specifically for computer users. Goldstar's GMK-49 (around £189) has 49 full-size keys, pitch bend and modulation wheels and buttons to access 128 program changes.

The exciting news is that while developers are porting software from the Mac to the PC, most new developments are taking place on the Mac. In terms of product, there's a lot to look forward to in the coming months. *Ian Waugh*



The editor in *Cubase Score* has many new functions and supports over 100 music symbols.



Steinberg's *ReCycle* lets you manipulate audio data in much the same way that you manipulate MIDI data.

MORE DETAILS

- Sound Technology: 0462 480000 – Emagic
- Harman Audio: 081 2075050 – Steinberg
- MCMXCIX: 071 723 7221 OSC – Opcode
- Arbiter: 081 202 1199 – Passport
- Digidesign: 081 875 9977
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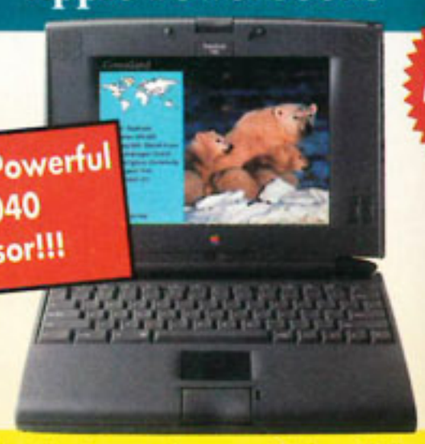

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PBk 540	12/240	66/33Mhz	16 Greys	Yes	(M2808)	£2
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PBk 540c	12/320	66/33Mhz	32,768 Colours	Yes	(M2810)	£3
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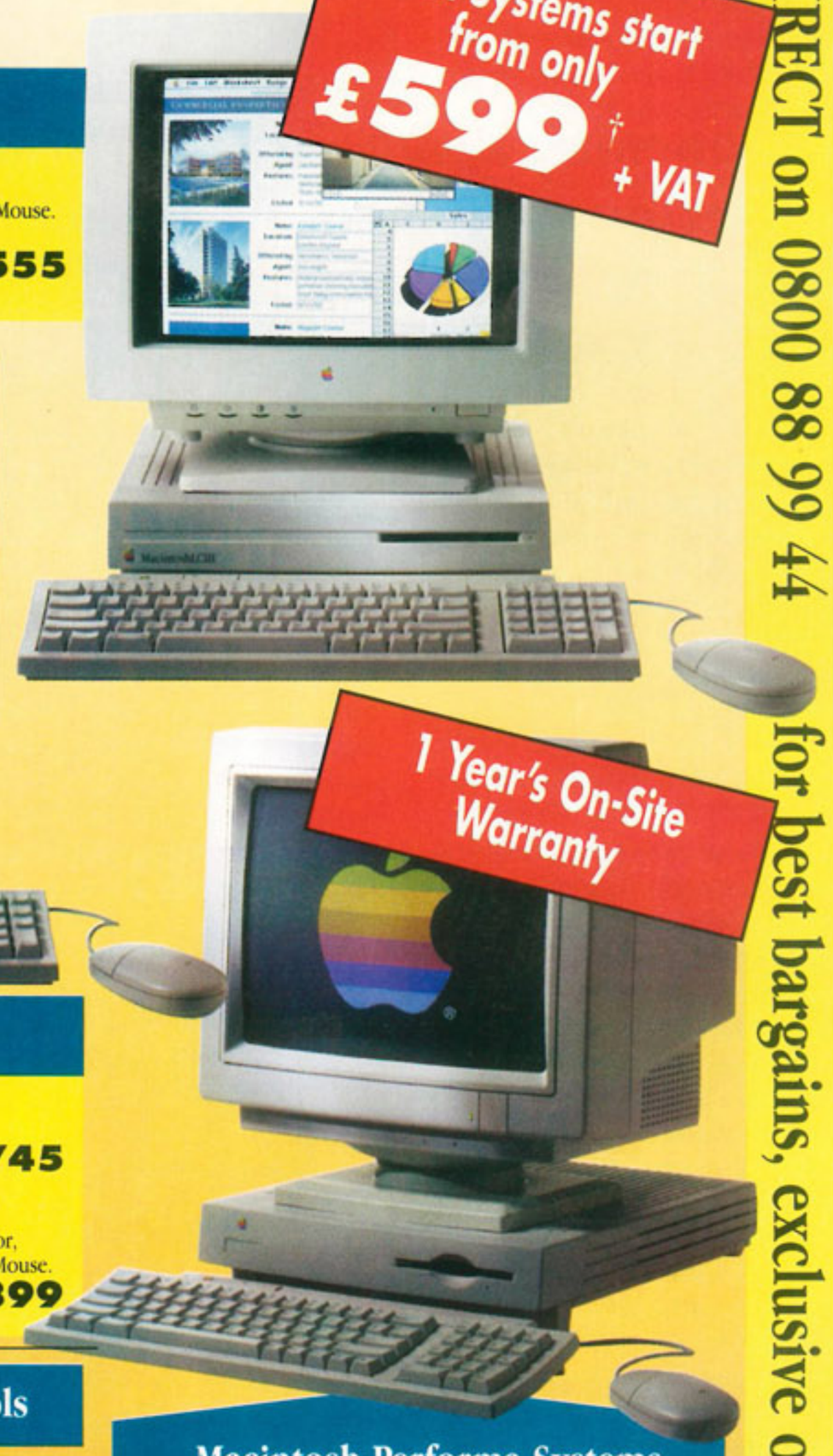

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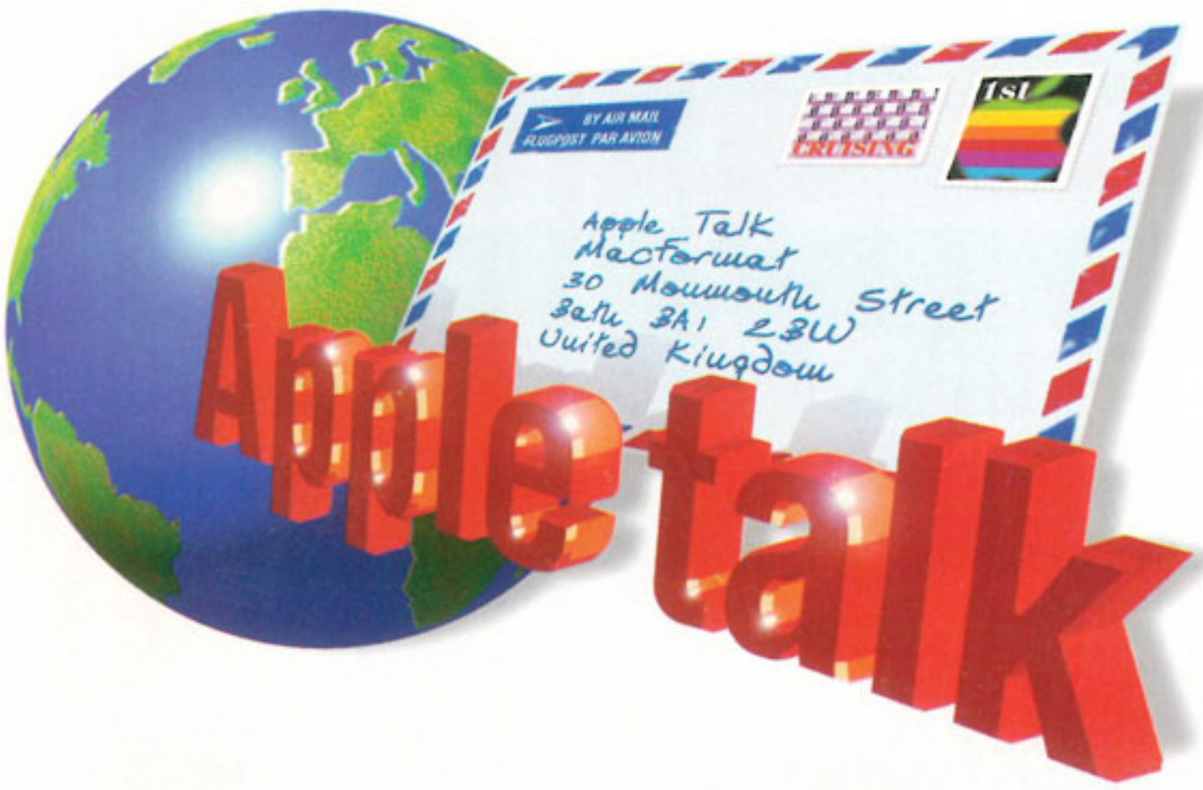


It's happening *again* – a T-shirt for every letter published! Write to 'Apple Talk', MACFORMAT, 30 Monmouth Street, Bath BA1 2BW.

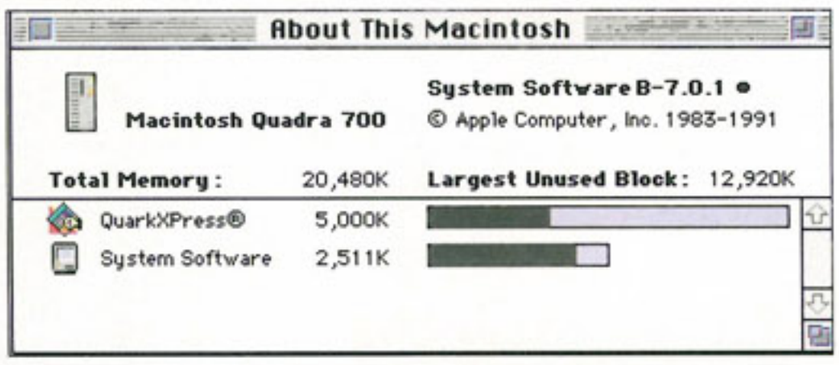
Stuart the Publisher is in a generous mood again, and he's approved an exclusive MACFORMAT T-shirt for *every* letter published this month! How long can Stuart's generosity go on? How long can our *stocks* last? Better send in that letter you've been mulling over...

First dalliance

I am a new and immensely inexperienced Performa 400 owner. On reading MACFORMAT I realised how little I knew and how confused I was. I already realise I have bought a machine with too little memory and need advice about how to increase the size, but I still cannot work out the difference between 4Mb of RAM and 40Mb of memory! This is my first dalliance with machinery and it makes me feel like a 13 year old in a brothel – frightened but fascinated. Is there anything available that takes you easily through the workings of a computer and especially a Mac?

P Ellis
Totnes, Devon

I do hope reading MACFORMAT makes things clearer rather than more confused! Our cover feature last month ('Memory Magic') was all about increasing your RAM and disk space without buying any extra hardware – turn to page 112 if you missed it – and this issue we show you how to fit memory chips yourself (see page 64). People often confuse memory and disk space – in fact, we have to plead guilty to obscuring the distinction ourselves last month for the sake of a good headline: 'memory magic and disk space prestidigitation' just didn't grab us, somehow. Strictly, RAM (Random Access Memory) is the 'work space' you need to actually run programs in, and disk space is the 'storage space' you need to save data in. So, what a computer 'remembers' things in is not memory at all, but space; memory *is what it uses to 'think' in. Simple. (Now I'm confused. Anybody know of a good introductory guide for 'P' and me?)*



This Mac has a *mere* 20Mb of RAM, it says here. Kind of makes you sick, doesn't it...

Demanding RAM

While games are not the most important thing to me, I do like trying out the ones on the MACFORMAT cover disk. However, I note that the *Prince of Persia 2* demo on your May issue needs over 3Mb of RAM to run. With the System taking up about 1,800K on my 4Mb LCIII, I was unable to try it out. I did try switching on Virtual Memory, but got a message telling me to switch it off.

With more sophisticated games and applications demanding more and more RAM, shouldn't the adverts for all software specify not just the model and System Software version but also how much RAM is needed?

Don Fram
Buxton, Derbyshire

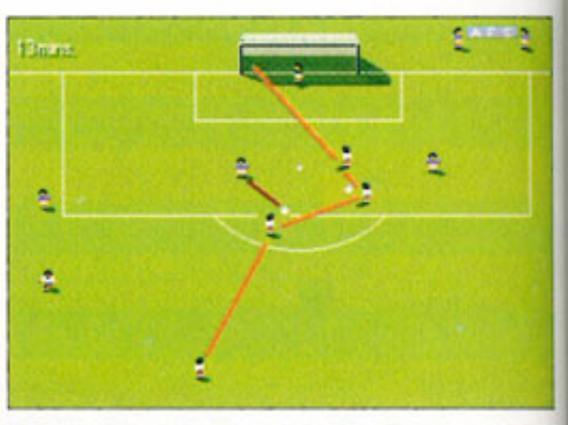
MACFORMAT's software reviews will always tell you how much RAM a program requires. The memory-hungry POP 2 *demo caught me unawares too – the only way I could get it to run on my 5Mb IIsi was to restart without Extensions. We've heard from several readers who were disappointed at not being able to try out the demo. Over to you then, MACFORMAT readers: would you prefer to do without exclusive demos of* big *new games on the MACFORMAT cover disk?*

Affordable joystick

In MACFORMAT 12 you asked, "Why oh why isn't there an affordable joystick for the Mac?" So I thought I'd tell you about mine. It cost me £17 and is fully compatible with my (dad's) Centris 650. It has built-in settings for games and can be used with your own settings as well. It's called Macfly and I bought it from America. If you want one, the address is: Macfly, IZU Products, RT2 PO3985, TX 75901, USA.

Ben Freeman
Leicester

Macfly? Next you'll be telling me it's shaped like a DeLorean and powered by lightning...



This is *Sensible Soccer* on the Commodore Amiga. Why can't you play it on your Mac?

Football crazy

I am on the verge of buying an LCIII 4/80. My problem is that I have a 14 year old son who is crazy about football games. Are there any football games like *Football Manager '94* for the Mac?

C R Richardson
Hull

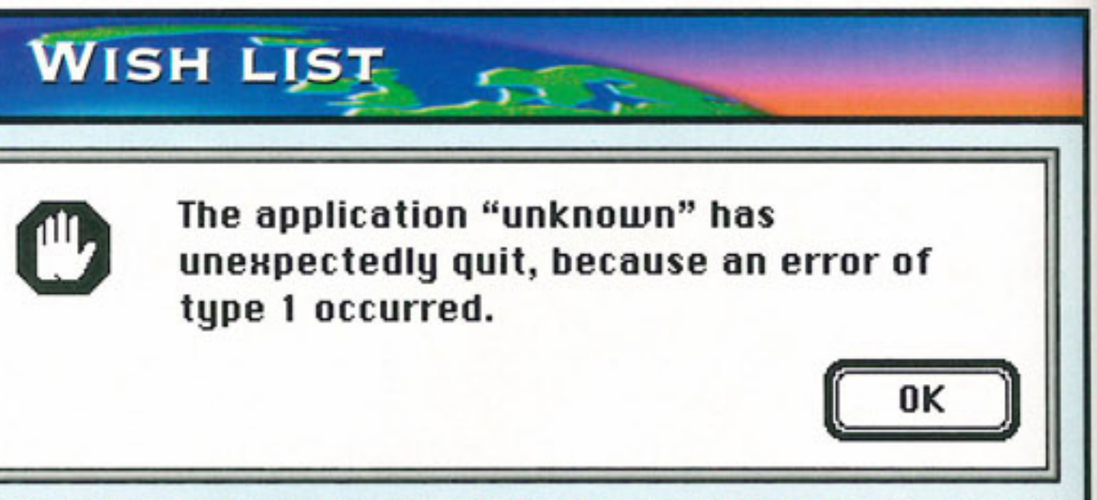
Football Manager*? Means nothing to me, I'm afraid. I recall a football game called* Playmaker *some time ago, but I've never tried it. Any football-mad* MACFORMAT *readers care to share their expert knowledge? (Now if you'd asked about Australian Rules football games, I'd have been interested. Still wouldn't have known of any, but I would have been interested...)*

A little confusing

I found your article on PowerMacs in MACFORMAT 11 a little confusing. Sometimes you refer to PowerMacs

WISH LIST

Davin Krause of Boondall in Queensland (this issue's token Australian) writes: "I have a suggestion for System 8 when Apple finally decides to roll it out. One thing that really bugs me is error messages like 'The Application <Unknown> has unexpectedly quit because an error of Type 39 occurred', whatever the hell that is. What Apple should do is replace that with something more useful. Sure, have the error message if that's what Apple wants, but what about telling the user what the error actually is? And how about including an option to fix that error immediately with Yes, No and Cancel buttons that can be clicked on – then, should you choose Yes, having the pertinent Control Panel launched, such as the Memory or Extensions panel?"



Type 1? That'll be a 'bus error' then. Wouldn't it be nice to be able to *do* something about it?

Seems like a good idea to us. Anyone else got any views about what they'd like to see in System 8 when it appears?

CRUISING THE KEYS

This month's selection of keystroke shortcuts, tips and discoveries...

■ Edward Shryane of County Galway in Ireland reports that he found this little trick while using the Monitors Control Panel. Hold down the [option] key and click on the Options button in the Control Panel. A new window appears, giving you access to a 'secret' feature – the gamma correction options. "Don't ask me what they do," Edward says, "but using 'uncorrected gamma' makes the screen a little duller. Try it!"

■ Jesper and Lena Emilsson, from Luleå in Sweden, add that if you click on the version number in the upper right-hand corner of the Monitors Control Panel, you'll see the names of programmers that worked on this part of the System software. While keeping the mouse button down, press the [option] key. You will see the happy face move its eyes and stick its tongue out. If you rapidly press the [option] key several more times while continuing to hold down the mouse button, you will see the names change.

■ Jesper and Lena also observe that although rebuilding the desktop usually involves holding down the [option] and [command] keys when your Mac starts up, System 7 actually lets you rebuild the desktop without restarting. While you are in the Finder, holding down the [command] and [option] keys and press the [esc] key. This brings up a dialogue box that asks if you want to force the Finder to quit. Click on Force Quit, and *then* hold down the [command] and [option] keys. The Finder restarts and asks if you wish to rebuild each disk that is currently mounted.

■ While they've got the floor, the Emilssons have also been having fun with System 7's little *Puzzle* Accessory (usually found in the Apple menu). When you open it initially, you will see only the Apple puzzle, but if you select Clear in the Edit menu a second puzzle, using numbers, appears. This is much easier, so you'll solve it faster and hear the hidden 'Ta-daa'-sound. Choosing Clear from the Edit menu again will bring the Apple puzzle back. You can also paste graphics into the Accessory to create your own puzzles.

■ Finally, Jesper and Lena have a time-saving tip that they have noticed works with most Claris programs (it may work with programs from other producers as well). Hold down the [command] key while launching the program, and instead of getting a new empty document, you will get an Open dialogue box that enables you to select an existing document.

and sometimes to PowerPCs. Are these the same thing or two separate machines? Is a PowerMac a Mac that can run MS-DOS or *Windows* software under emulation, and a PowerPC a PC that can run Mac software under emulation? Could you also tell me whether it would it be possible to connect one of these new machines up to your old Mac or PC and use the old machine as an external hard drive?

Nigel Street
Douglas, Isle of Man

No, the two are not quite the same thing. Power Macintosh (PowerMac for short) is Apple's name for its new range of machines; PowerPC is the name of the central processing chip inside them (and also inside the new machines from IBM which have not yet actually appeared). The emulation question is even more confusing than you think: because the new machines use an entirely different family of chip from all previous Macs, PowerMacs aren't strictly speaking Macs at all and actually run Mac *software under emulation! However, this is hardware emulation – it doesn't require a separate emulation program – and as far as we know is very reliable indeed. If you want to run* Windows *software on a PowerMac, you need to use the supplied* SoftWindows *emulation software, which I understand is pretty hot stuff... but our office PowerMac 6100 only has 8Mb of RAM, which isn't actually enough to run* SoftWindows *and any* Windows *software... As for using another machine as an external hard drive, I've seen it done with two Macs, but I don't know if there are any connection problems with the PowerMac's interfaces. Anyone tried it out yet?*

New dimensions

I am a comic collector as well as a Mac enthusiast, and while reading the January issue of MACFORMAT I found that on certain pages the colours were printed 'out of register'. This reminded me of the old 3D comics in which the red and blue colours were offset, so that when you viewed the page with special 3D glasses you got an image that seemed to leap off the page.

I got out my old 3D glasses, but the effect was bland. Then I remembered a new process used in Valiant comics called 'Valiant Vision'. The effect was phenomenal. I am sure that if you were to get your hands on some Valiant Vision glasses you would see an entirely new dimension in MACFORMAT. Specialist comic shops would probably be the best source.

Valiant Vision is a rather interesting novelty and I am sure that MACFORMAT readers will definitely appreciate being on the cutting edge of a new publishing trend.

Frank F Carucci
Sudbury, Ontario, Canada

*As a comics enthusiast myself, I've also tried the Valiant Vision glasses on anything and everything, and they really are astonishing. Apparently they use some sort of prismatic system to make warm colours leap out at you and cooler colours recede, or something like that – I'd love to know how they work. (Any experts reading this?) For the uninitiated, the 'Valiant' in question is a present-day American publishing house, not the UK boys' title of the '60s and '70s. (*TV21 *was miles better anyway. I still wish I had a set of 'em.)*

Two more MACFORMAT T-shirt winners: Robert Holder of Bridgend, West Glamorgan, and Colin Shelbourn of Windermere. Coincidentally, both drew their own cards – but you don't *have* to do that! *You* could win for any postcard that takes our fancy.

Kit-bag lunacy

As a foreign correspondent I carry a PowerBook Duo, a Hewlett Packard 310 printer, a Pace Microlin fax-modem and, as a back-up, a WorldPort data-modem plus two small tape recorders. Each of these miracle machines comes supplied with a separate power adaptor which is often larger and heavier than the device it's supposed to power, each has a different plug size, and each operates on a different DC output.

In a war-zone with no electricity, like Bosnia, I can use all of them on batteries, of course, but the batteries run down or need to be recharged at some stage. Furthermore, at home, my computer, monitor, modems and printer occupy five power sockets. Add a CD-ROM player, two tape recorders and a telephone answering machine and my basic system is using nine power sockets with eight bulky AC adaptors.

This is crazy. Surely there's a manufacturer who can produce one small AC/DC power adaptor with a set of multiple output sockets, each of which can be user-configured to provide the correct volts/amps for a range of devices?

Thanks to this lunacy in my kit-bag, my right shoulder is now three inches lower than my left shoulder.

Christopher A Long
Somewhere in London

So you have a pronounced leaning to the right then? Understandable, I suppose, with such a strong case for some entrepreneur to meet the needs of the market... Anyone know a solution?

Got something to say? Write to MACFORMAT *at the address on the opposite page.*

What's new?

Andy Storer expounds the virtues of his new PowerMac and puts a marvellously clever route planner through its paces – only to find that it doesn't acknowledge the existence of the M25.

Since last month, I've been the proud custodian of our office's PowerMac 6100 – we had to get one in pretty pronto because some sod nicked my LC when it was taken along to a computer show to appear on our company stand. I'm not complaining (luckily, in a rare fit of cautious maturity, I'd backed up all my personal contents), but swapping an LC for a 6100 is like driving a Fiesta which suddenly decides to morph into an XJ220 – just when you're smack-bang in the middle of the worst traffic jam ever. Because, while you've got all that extra power under the hood, there are precious few applications which'll make direct use of it. Sure, everything zips along at Quadra 700 speed, but it's only when you use an accelerated 'native' application like *Photoshop* that you see what all the fuss is about. The only word to use is 'Strewth'. Filters, effects and redraws take place virtually the second you click on them. So, the quicker all our favourite applications are converted, the better. We'll all get things done a lot faster, be more productive and competitive, less frustrated by wait states etc etc. But it's funny how there's always a flip side to technological advances: it's not as though we'll all get to go home any earlier, is it? We'll just do loads more in the same time we've always had available. Still, as long as we stay busy...

And those PowerMacs are certainly very busy. Busy being sold like hot cakes. Apple has just posted its second quarter earnings and revealed that it has shipped 145,000 of the beasts. Even then, it's only a small percentage of the total revenue for the three month period. To give you an indication of just how big a company Apple is these days, chew on the fact that its revenue for those 12 weeks was $2.08 billion. Yep, that's Billion. Or the useful sum of $24 million a day. Not bad for an outfit that started out in a garage.

Interestingly, two other pertinent facts emerge once you've dispatched all the other financial gubbins to the waste bin. First, Japan is now the largest market for Apple outside the States, and second, Apple is now spending less than half of what it used to spend on research and development. Try as I might, I can't see any way in which these are connected, but I think slashing R&D is the last thing Apple should be doing when it's selling so many units in Japan. It's not as if Japan is exactly top of the list when it comes to original technology ideas, is it? And Apple's whole history has been based on bright ideas. Add that to rumours that it's actively looking for hardware partners to clone the crown jewels of System 7 into non-Apple boxes, whilst simultaneously cutting back on R&D, and trouble just has to be lurking around the corner. Before you know it, Apple could have lost its edge. Particularly when you consider that parallel to that cut in R&D this last quarter has come a cut in profits too – down from $110 million a year ago to just $17 mill for the last three months. Still, at least its Board of Directors now has faster machines, so they can work through the spreadsheets in less time; this will presumably give them more time to plan a route around the jam that they may be driving into.

Meanwhile, I've been trying to avoid jams too. I'm off down the M4 to Gatwick soon for a quick jaunt over the water, so when a new route planner arrived in the office, I thought, "Here we go! Tap in the road route from Bath, print it out for wifey and hey presto, no more arguments over her peculiarly unique style of map reading". *SignPost* is the planner in question and in most departments it's pretty neat, fast, friendly and fun. But it has one serious omission. There's no M25.

Waste of space

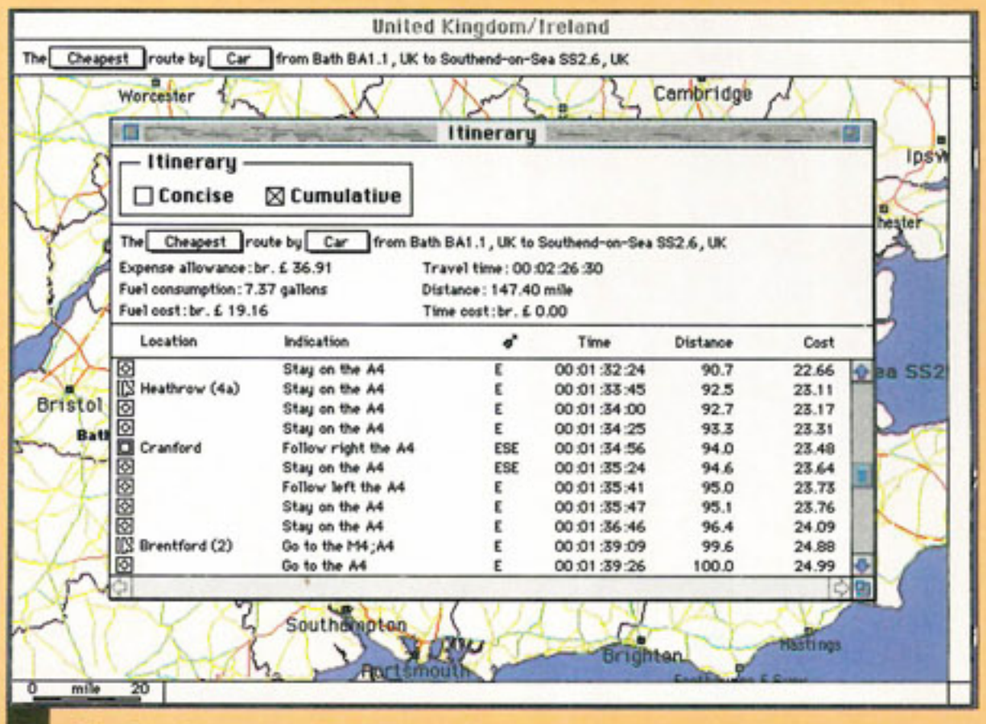
Now, we may as well take it for granted that the M25 is a complete waste of space – and for readers who've never experienced its scenic delights, let's just say it'd be a far better use of tarmac if NCP bought it and used the damn thing as a car park. Then at least there wouldn't be any confusion as to why you're sitting around just waiting for *Falling Down* to happen. So when *SignPost* ignores the M25's existence for any journey crossing London, you could conclude one of two things. One, its developers, a Dutch company called Route 66, are fully conversant with the nightmares of urban alienation and, short of giving you a bag full of serious military hardware, are doing their best to save you from the torture of today's traffic torment. Or, two, the chaps at Route 66 are a few cones short of a contraflow. Neither, of course, is true.

The fact is that the M25 we all know so well (right down to the last square inch passing at 2 mph in most cases) is in there. It's just that *SignPost's* route searching algorithm doesn't accord it any usefulness as a means of getting from A to B. And while this is undoubtedly true for peak traffic times, a trip at 2am is more likely to be a case of pedal to the metal and "wasn't that our turning which we just whizzed past at over a ton?" But until *SignPost's* interface enables you to input what time of day you will be travelling at, the problem will remain. So I called Route 66 and explained my predicament, only to be told that it's not just the M25 that's the anomaly here, but any motorway which circles large urban areas. And since *SignPost's* other map modules cover the whole of the USA, Europe and Scandinavia, there's bound to be a few similar problems en route. Put it this way: I wouldn't fancy driving around LA with it, would you? I can see it right now – straight through to South Central, then, whoops you've

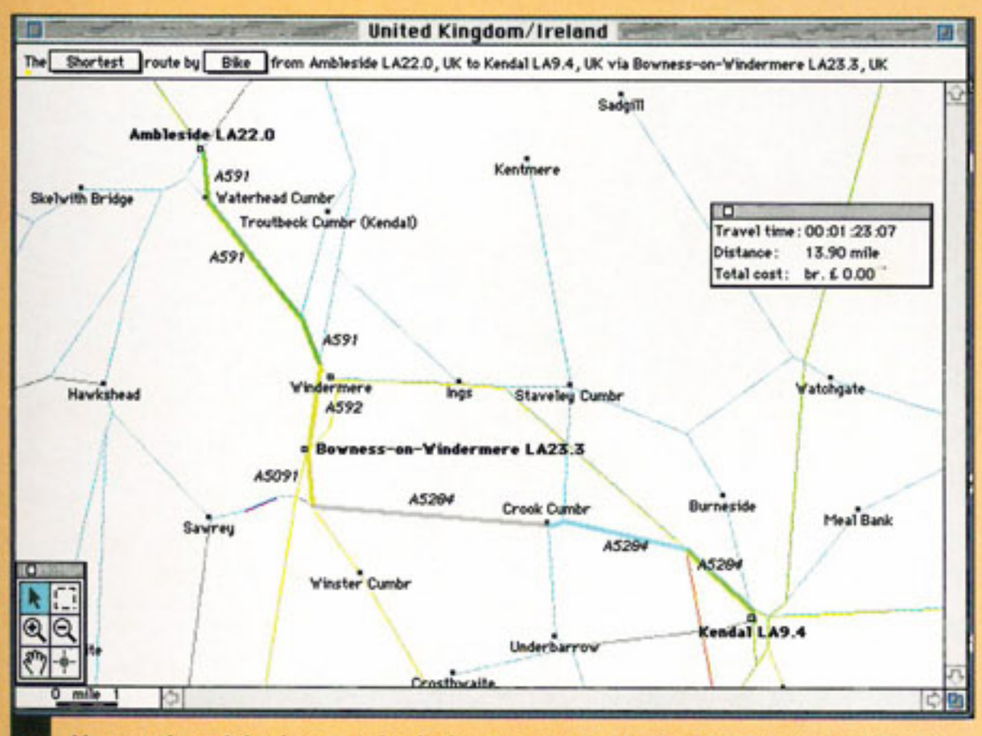
Well, which would you rather own? It's simple really, when you have no choice in the matter. Yep, my trusty old bat on the left got nicked and, hey presto, the brand new spanking beast on the right arrived forthwith. Initial response on using the new 6100? – *Strewth*!

THE LONG AND WINDING ROAD...

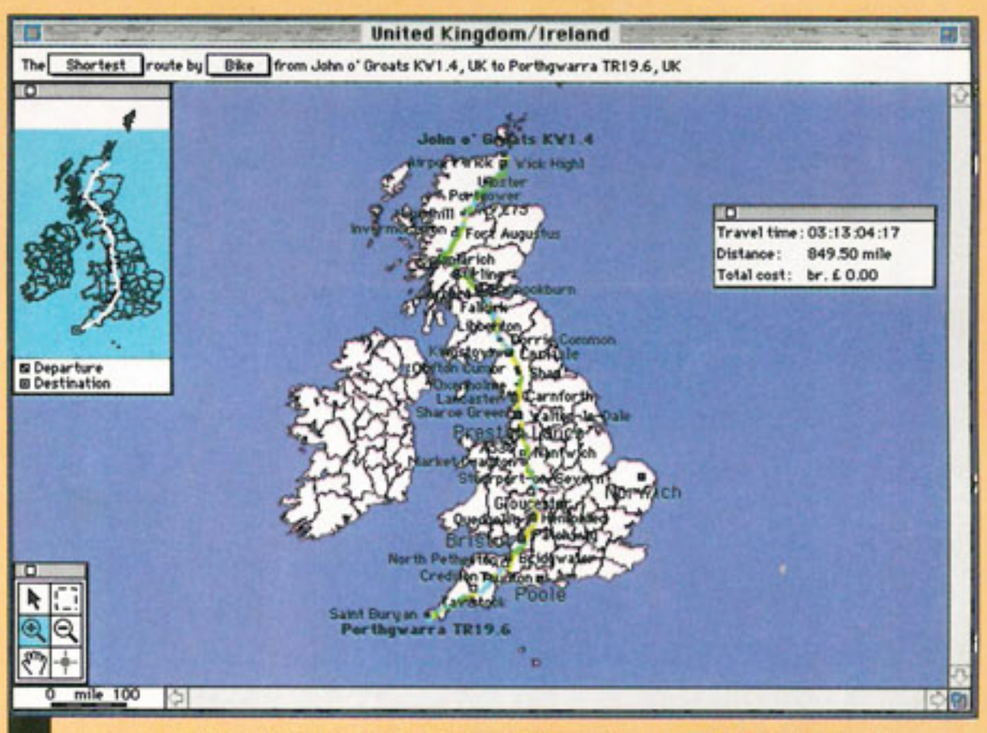
1 Here we're using *SignPost* to plan a route from Bath to sunny Southend-on-Sea – but notice how the route takes us straight through the middle of London. Hmm, very clever.



2 *SignPost* has not only taken us along the A4 for most of the journey, when the M4 would be better, but has failed to route us around the M25 – this is because it doesn't rate the M25 as having any functionality whatsoever.



3 Here we've picked a popular little route in the Lake District, from Kendall to Ambleside via Bowness. Ideal for a short bike ride – pity there's no indication of where pubs serving real ale are to be found though…



4 Here's the bicycle route from John O'Groats to Land's End (well, close anyway) – non-stop three days and 13 hours. *SignPost* could be improved if you could set the number of hours you'd prefer to drive or ride.

run out of gas. Sorry, isn't that an Uzi? Oh dear. Big Goodbye.

But aside from that little quibble, I like it. Dangerous maybe, but likeable all the same. And like all bugs, it should be called a feature and marketed as such. Something like, 'With journeys through Hell overlays included' should do the trick. But I'm being unfair. The guys at Route 66 are genuinely on the ball; their aim is to release data maps which include street level networks by September of this year. These will feature one-way system details, and, as we all know, this is really where route planning of any kind to date falls short. Well, it's certainly something which *SignPost's* main competitor, *AutoRoute*, doesn't take into account. Route 66 also assured me that the mysterious case of the missing M25 will be solved by then too. My advice? Wait until September, unless you have an almost pathological love of six-lane orbital thruways.

And for those whose particular pathology extends to a hatred of 'A' roads, never mind motorways, another option in *SignPost* is likely to prove useful. If you wish, you have the option of making journeys by bicycle. While this is perhaps somewhat predictable given the nationality of *SignPost's* authors, at least Holland has a fantastic cycling network. In the UK, as far as I'm concerned, you may as well ride around with the words 'Please Kill Me Now' painted on your back, once you venture into what we politely call traffic. It gives the phrase 'hitting the open road' a whole new meaning, at any rate.

Cycling power

But cynicism apart, the option to enter journeys by cycle is great if you happen to be in The Lakes, The Fens, Scotland, Ireland or wherever. Brilliant for planning that circular weekend ride between pubs for sure. What's more, since you can zoom into portions of maps, then print them, you could sellotape the results to your handlebars. Seriously though, *SignPost* is handier still because you can also copy and paste maps into other applications, if you wish. Whether it's worth £116 at this moment in time, though, is debatable – unless you don't want to go anywhere near the M25, in which case give Softline a call on 081 401 1234 for more details.

Finally, regular readers of this column will recollect my love of little known utilities which become indispensable. The latest of these to make their way on to my hard disk is *LoadAdrive*. This is so simple, it's a wonder it's taken so long to arrive. All it does is enable you to power up and access a CD drive after you've turned your Mac on. Normally, if you'd forgotten to do so, you'd have to reboot. Like the screensaver *Eclipse*, which does nothing more than flash the time on your monitor after a set period of inactivity, it comes in very handy. And as with *Eclipse*, I'll just conclude that maybe it's no big deal – but then it's no big code size either. What's more, it's freeware, so if you send a disk and SAE to Dieter Spaar, Schnerzhofer Str. 2, 86865 Markt Wald, Germany, you can get a copy. But send him a pressie as well, eh?

Andy Storer

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	LC475	040/25	8/160	36	✗	✗	£826 (£970)	£999 (£1174)	£1119 (£1315)	✓	✓	✓
	Quadra 610	040/25	4/160	68	✓	✗	£968 (£1137)	£1229 (£1445)	£1354 (£1591)	✓	✓	✓
	Quadra 610	040/25	4/160CD	68	✓	✓	£1174 (£1380)	£1449 (£1703)	£1559 (£1832)	✓	✓	✓
	Quadra 610	040/25	8/230CD	68	✓	✓	£1454 (£1708)	£1729 (£2032)	£1829 (£2150)	✓	✓	✓
	Quadra 650	040/33	4/160	136	✓	✗	£1293 (£1519)	£1525 (£1792)	£1639 (£1925)	✓	✓	✓
	Quadra 650	040/33	4/160CD	136	✓	✓	£1410 (£1656)	£1679 (£1973)	£1757 (£2065)	✓	✓	✓
	Quadra 650	040/33	8/230CD	136	✓	✓	£1694 (£1991)	£1959 (£2302)	£2049 (£2408)	✓	✓	✓
	Quadra 660AV	040/25	8/230CD	68	✓	✓	£1349 (£1586)	£1679 (£1973)	£1789 (£2103)	✓	✓	✓
	Quadra 660AV	040/25	8/500CD	68	✓	✓	£1469 (£1727)	£1749 (£2056)	£1849 (£2173)	✓	✓	✓
Apple Power Macintosh	6100/60	601/60	8/160	72	✓	✗	£1247 (£1466)	£1519 (£1785)	£1634 (£1920)	✓	✓	✓
	6100/60	601/60	8/250CD	72	✓	✓	£1587 (£1864)	£1849 (£2173)	£1975 (£2321)	✓	✓	✓
	7100/66	601/66	8/250	136	✓	✗	£2100 (£2467)	£2365 (£2779)	£2490 (£2926)	✓	✓	✓
	7100/66	601/66	8/250CD	136	✓	✓	£2285 (£2685)	£2549 (£2995)	£2674 (£3142)	✓	✓	✓
	7100/66-AV	601/66	8/500CD	136	✓	✓	£2901 (£3409)	£3086 (£3626)	£3209 (£3771)	✓	✓	✓
	8100/80	601/80	16/500CD	264	✓	✓	£3975 (£4671)	£4129 (£4852)	£4259 (£5004)	✓	✓	✓
	8100/80-AV	601/80	16/500CD	264	✓	✓	£4047 (£4755)	£4199 (£4934)	£4331 (£5089)	✓	✓	✓
	8100/80	601/80	16/1000CD	264	✓	✓	£4427 (£5202)	£4455 (£5235)	£4579 (£5380)	✓	✓	✓

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- ✤ FREE Apple 12 months on-site maintenance with ALL Mac Value Added Packs and MOST Apple Hardware - Just look for the logo!
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FREE On-Site maintenance - goods displaying this logo!

No more waiting for products to be returned... ✤SIMPLY PHONE & AN ENGINEER WILL CALL AT YOUR ADDRESS THE NEXT WORKING DAY ✤ COVER IS FOR A FULL YEAR ✤ REPAIRS WILL BE FREE (both parts AND labour) ✤ SIMPLY TO EXTEND COVER FOR UP TO 3 YRS! Offer applies to all Major Apple hardware (unless on-site is detailed as optional eg. Add-On CD ROM Players etc.) Please contact us should you require full details of applicable goods/service details

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(Prices shown are exc. VAT @17.5%)

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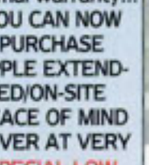

CLARIS WORKS WP, Database, Draw/Graphics, SpreadSheet, Graphs/Charts & COMMS WORTH OVER £100!!! With ALL Desktop Macs & Power PC's

FREE STARTER PACK Worth OVER £30
✤10-DS/HD Disks
✤Mouse Mat
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✤Mouse Mechanic
WITH ANY MAC & MONITOR SYSTEM!

WARRANTY UPGRADE!
If you have Apple hardware under normal warranty... YOU CAN NOW PURCHASE APPLE EXTENDED/ON-SITE PEACE OF MIND COVER AT VERY SPECIAL LOW PRICES!

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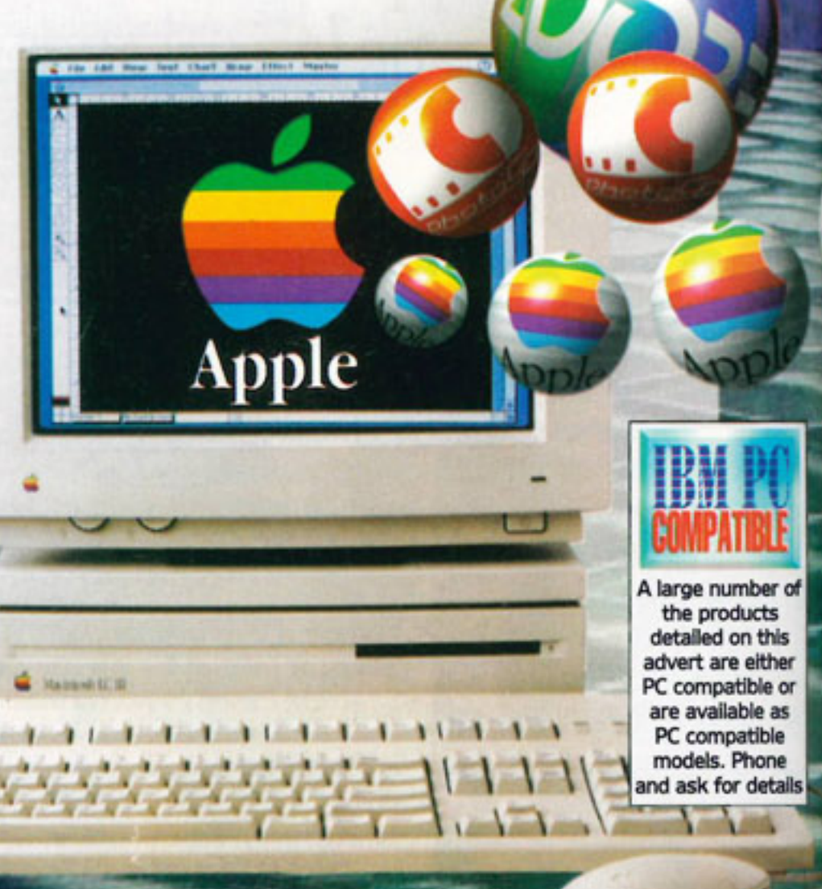
We accept all major credit cards and even Lombard CreditCharge Cards (used by Currys/Dixons etc.) OR why not ask for written details about Apple Commercial Credit



IBM PC COMPATIBLE

A large number of the products detailed on this advert are either PC compatible or are available as PC compatible models. Phone and ask for details

STOP PRESS... FAX MODEMS FOR YOUR POWERBOOK AT ONLY £189+VAT
See SUPRA Details Bottom Right of Page

POWERBOOK SYSTEMS

FREE STARTER PACK FROM HARWOODS! Worth £30!!!
Genuine Apple™ Carry Case WITH ALL POWERBOOKS! And... a FREE Monitor Cable Adaptor with all PowerBooks except 145B's. ALL our Powerbooks include batteries and an AC mains charger unit!!!

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	Model Type	CPU/ Speed	Mono/ Colour Screen	RAM/ Hard Drive	Included Fitted Items	Modem	External Monitor Support	HARWOOD BUNDLE PRICE
Apple PowerBooks	145B	030/25	M	4/80	Modem	✔	✗	£999 (£1174)
	145B	030/25	M	4/120	✗	✗	✗	£1049 (£1233)
	165C	030/33	C	4/120	Modem	✔	upto 16"	£1749 (£2055)
	180	030/33	M-AM	4/120	✗	✗	upto 16"	£1649 (£1938)
	180	030/33	M-AM	4/120	Modem	✔	upto 16"	£1849 (£2173)
	180C	030/33	C-AM	4/160	✗	✗	upto 16"	£1699 (£1997) SPECIAL OFFER
	180C	030/33	C-AM	4/160	Modem	✔	upto 16"	£1949 (£2291)
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	250	030/33	M-AM	4/200	✗	✗	upto 16"	£1549 (£1821)
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NEW LOW PRICES

Duo Dock - for all Duos except 270	£499 (£587)
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NEW

NOW IN STOCK...
NEW NEWTON MESSAGE PAD 100 & 110
Existing Newton owners can upgrade from just £49+VAT+p&p! Brand new version Organiser - Note Pad, To-Do List, DateBook & Name File. Batteries (4 AAA) AC Adaptor. New 110 Model incorporates deferred and single character recognition and more memory, fully redesigned enhanced writing recognition and longer battery life.
ALL OUR NEWTONS HAVE A FULL 1 YR APPLE DIRECT REPLACEMENT WARRANTY!!!

NEW NEWTON 100/110's
£389 (£458) MODEL 100
£469 (£552) MODEL 110
£CALL MODEL 100 OR MODEL 110 + COMMS (ie. Inc. EXT FAX)
£49 (£58) UPGRADE YOUR OLD NEWTON TO A NEW 100 MODEL!!!

ASK FOR YOUR FREE NEWTON INFORMATION PACK DETAILING ACCESSORIES AND SOFTWARE

NEWTON ACCESSORIES...			NEWTON SOFTWARE...		
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Carry Case	£29.40	(£35)	Expense Plus!	£58.38	(£69)
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Leather Case	£39.79	(£47)			
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INKJET PRINTERS TO SUIT YOUR POCKET

Apple StyleWriter II-Mono,	£235	(£277)
Portable StyleWriter-Mono,	£299	(£352)
HP DeskWriter 310-Mono,	£195	(£230)
HP DeskWriter 310-Optional colour kit	£31.95	(£37.54)
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SPECIAL OFFER ON APPLE PERSONAL LASERWRITER 320

ONLY 10 LEFT AT THIS PRICE!
LaserWriter 320 was £675 now ONLY £599 (£704)

PRINTER MODEL	SIZE	dpi	ppm	PostScript	Special Features	PRICE
Personal LaserWriter 300	A4	300	4	✗	LOW COST	£499 (£587)
Personal LaserWriter 320	A4	300	5	✔Level 2	RISC Based	£[illegible]
LaserWriter Select 360	A4	600	10	✔Level 2	Auto Emulation	£1299 (£1527)
Hewlett Packard HP4ML	A4	300	4	✔Level 2	Manual Emulation	£799 (£939)
Hewlett Packard HP4MP	A4	600	4	✔Level 2	Auto Emulation	£969 (£1139)
Hewlett Packard HP4M	A4	600	8	✔Level 2	Auto Emulation	£1399 (£1644)
GCC BLP ECLIPSE 4	A4	300	4	✔Level 2	Edge-Edge Print	£699 (£822)
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FREE On-Site Maintenance on ALL Apple Laser Printers!!!

ALL OUR LASER PRINTERS ARE SUPPLIED WITH A SERIAL CABLE FREE OF CHARGE!

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A superior quality Ink-Jet Printer for BOTH Colour (CMYK) and Mono. Ideal for Home, Business or Educational use. 360dpi resolution, up to 2 ppm of A4 printing. Apple ColourShare matching Technology. Supplied with 64 TrueType Fonts. Prints on Plain, Transparency, Coated, and BACK PRINT PAPER (for exceptional near Dye-Sub Quality results!)
ASK FOR YOUR FREE COLOUR PRINT SAMPLE!!!
£549 (£645)

LINOTYPE HELL FONT CD
"JUST IN TIME" FONTS ON CD ROM!!! 2400 Viewable LINOTYPE PostScript Fonts, Font Utilities, Clip Art to unlock & purchase by phone. Includes a few UNLOCKED PRINTABLE FONTS & CLIP ART £14.95 (£18)

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400dpi GREYSCALE HAND HELD SCANNER Plus...IMAGE ASSISTANT GS - Graphics S/W OMNIPAGE - Direct OCR Software FAXMASTER - FAX Software
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50 TDK 3.5" DS HD	£49.95
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SPORTSTER EXTERNAL FAX MODEM
14400bps · BABT Approved · Includes Software
Only... £164 (£193)

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Shown are just a few examples:
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ALL RAM UPGRADES are fitted FREE for personal callers .

AMAZING RAM DOUBLER
SUPERB SOFTWARE THAT REALLY DOES DOUBLE THE RAM OF YOUR MAC... AND AT REALLY LOW COST!!! SICK OF THOSE "OUT OF MEMORY" MESSAGES WITHOUT EXPENSIVE RAM!
£59 (£70)

NEW APPLE 17" AND 20" TRINITRON MULTISYNC MONITORS (INCLUDING PC ADAPTOR TOO!)

MACINTOSH MONITORS

A MASSIVE 30% EXTRA VIEWABLE AREA ON SCREEN*!

ATTENTION 12" MONITOR OWNERS, LOW COST 14" HI-RES REPLACEMENT...
If you have an LC, LCII or other Mac with a 12" Colour Monitor*, take this chance to increase your view to the FULL WIDTH of an A4 letter on screen!!! NO MORE scrolling from side to side. .28 Dot Pitch 14" Colour Plus Display featuring... Anti Glare Screen & Tilt and Swivel Stand built-in. An ideal LOW COST option with crisp, clear flicker free high resolution of 640 x 480.
BRILLIANT APPLE MONITOR FOR THE PRICE!
£159 (£187) Optional On-site
IDEAL AS BASE MONITOR FOR MOST POWERBOOK/DUO OWNERS (Phone us!)

MONITOR MODEL	COLOUR	SIZE	DOT PITCH	MAC RESOL.	REFRESH	PRICE
APPLE 14" COLOR PLUS	✔	14"	0.28	640x480	60.0hertz	£159 (£187)
APPLE 14" TRINITRON	✔	14"	0.26	640x480	66.7hertz	£259 (£305)
NEC 3V 15" COLOUR	✔	15"	0.28	640x480	72.0hertz	£399 (£469)
NEC 4FG 15" COLOUR	✔	15"	0.28	832x624	72.0hertz	£549 (£646)
APPLE 17" TRINITRON NEW	✔	17"	0.25	832x624	75.0hertz	£CALL US NOW
APPLE 20" TRINITRON	✔	20"	0.26	1024x768	75.0hertz	£1549 (£1821)
PHILIPS 17" STEREO	✔	17"	0.31	832x624	72.0hertz	£599 (£704)
PHILIPS 20" TRINITRON	✔	20"	0.31	1024x768	72.0hertz	£1399 (£1644)

APPLE QUICKTAKE CAMERA

- 24 Bit Colour Images
- 320 x240 or 640 x 480
- Stores up to 32 images
- Download to MAC up to 1 year later!

MAC VERSION £536 (£630)
PC VERSION £559 (£657)

- Auto Exp.1/30 to 1/175sec
- Apertures: f2.8 - f16
- Focus 4ft to Infinity
- Auto Flash
- Standard Tripod Socket

MACINTOSH SCANNERS

NEW EPSON GTX AND GTI RANGE AT EVEN KEENER PRICES WITH SOFTWARE!

NEW GTX 6500 upto 1200dpi with Photoshop LE & Omnipage Direct	£599 (£822)
NEW GTI 6500 upto 1200dpi with the FULL VERSION of Photoshop	£849 (£998)
NEW GTX 8000 upto 1600dpi with Photoshop LE & Omnipage Direct	£875 (£1029)
NEW GTI 8000 upto 1600dpi with the FULL VERSION of Photoshop	£999 (£1174)
MICROTEK II & Photoshop LE	£599 (£704)
MICROTEK IIsp & Photoshop LE	£689 (£810)
MICROTEK IIcx & FULL Photoshop	£839 (£986)
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Buy an Apple CD Player and get a Linotype Font CD for only £9.95 (£11.70)

APPLE POWER CD PORTABLE - Link to Mac via SCSI Port, Link to TV via SCART/CVBS to play Photo CD, Plays stereo audio CD through Hi-Fi System. Inc. SCSI cable & terminator
£169 (£199) Optional On-site warranty available

APPLE CD 300 ROM DRIVE - Dual Speed, Photo CD, stereo audio and CD ROM on your MACINTOSH. (Please state if you require a SCSI cable and/or terminator when ordering).
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NEC

NEC MULTISPIN 3XP PORTABLE ROM DRIVE
Photo CD, Stereo Audio, Multi Session, Battery option for use with PowerBooks
£319 (£375)

NEC MULTISPIN 4X PRO ROM DRIVE
Photo CD, Stereo Audio, Multi Session, Super Fast...RUNS AT 4 TIMES NORMAL CD SPEEDS!
£689 (£810)

PHONE US NOW FOR DETAILS OF CD SOFTWARE TITLES INCLUDING GAMES AT SPECIAL PRICES!

NEW

APPLE MULTIMEDIA ADD ON
For existing Mac owners this great kit adds Multi- media in one complete package! Contains AppleDesign Powered Speakers, High Speed AppleCD 300 ROM Drive, QuickTime, SCSI Cables/Terminator & Software.
FOR MAC: £295 (£347) Optional On-site warranty
FOR PC: £335 (£394) Optional On-site warranty

GENUINE UK SOFTWARE-Great Prices!

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Microsoft Creative Writer for Children	£39	(£46)	PageMaker 5.0	£449	(£528)
ACCOUNTS AND SPREADSHEETS			Adobe Illustrator 5.0	£Call	(£Call)
SAGE Bookkeeper	£129	(£152)	**UTILITIES**		
SAGE Accountant	£259	(£305)	After Dark	£37.50	(£45)
Microsoft Excel	£224	(£264)	More After Dark	£27.50	(£33)
DARKROOM			Capt. Marvel Saver	£20.99	(£25)
Photoshop 2.5	£Call	(£Call)	Norton Utilities	£79	(£93)
Morph 2.0	£124	(£146)	NOW Utilities	£74	(£87)
INTEGRATED			Apple PC Exchange	£48	(£53)
Claris Works I	£99	(£117)	Apple QuickTime	£95	(£112)
Upgrade Claris Works I to II	£60	(£71)	Apple System 7.1	£45	(£53)
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Microsoft Office	£369	(£434)	NEW FAST VIREX	£49	£58
BUSINESS			StarTrek Sound Samples	£14.95	(£18)
AutoRoute	£99	(£117)			
Aldus Persuasion	£235	(£277)			
FileMaker Pro	£134	(£158)			
Claris Impact	£174	(£205)			
Aldus Collection	£699	(£822)			

FULL RANGE OF GREAT SOFTLINE PRODUCTS ALWAYS AVAILABLE

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US FCC Approved (but not BABT)

144LC V3.2bis
Transmit and receive faxes and data at up to 14400bps. Cable, modem to modem COMMS software and easy to use "FaxSTF" software included. A simple and easy to use Budget Fax Modem...
£136.13 (£159.95)

SUPRA V3.2bis
Transmit and receive faxes and data at up to 14400bps. Cable, modem to modem COMMS software and easy to use "FaxSTF" software included. Silent Answer Facility, L.E.D. Readout
£182 (£214)

PowerBook V3.2bis
Simply plug into a phone socket to transmit & receive faxes & data from your PowerBook at up to 14400bps. Cable, modem to modem COMMS and "FaxSTF" software included.
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Dept. MAF/A6 NEW STREET ALFRETON DERBYSHIRE DE55 7BP

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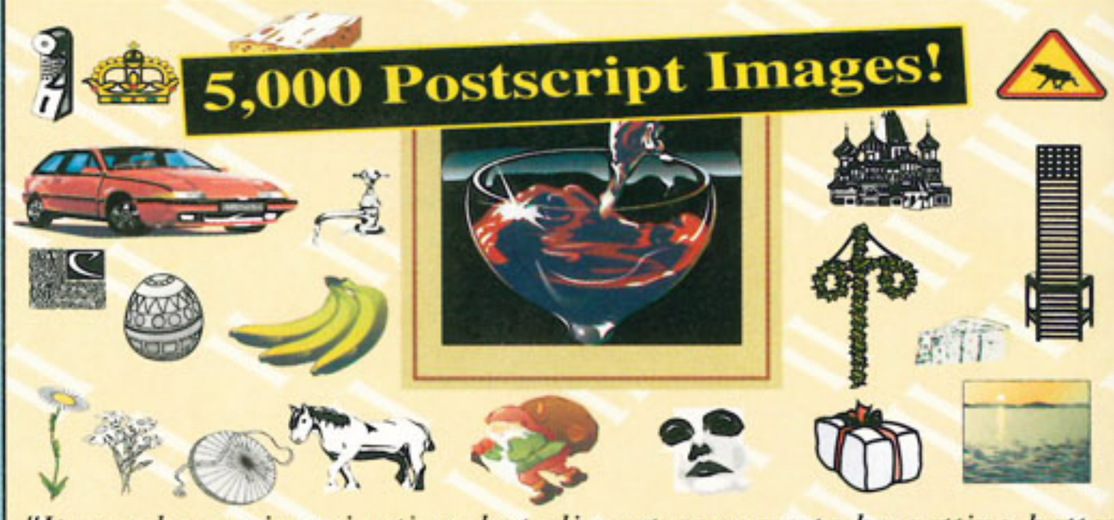

"It may be my imagination, but clip art appears to be getting better lately. Instead of the over-ornate, all-American images in PICT, there are vast swathes of art nouveau, art deco - even modernist work - and other items of fundamental ornament value in high-resolution file formats... An excellent collection.", review by MacUser UK, 1993.

£89 +vat

All the 4,032 images in Classic plus another 968 images of even higher quality, over 550 MB, 13% in color. Images are stored in Freehand 3.0, Illustrator 88 1.1, EPS, PICT (Mac), WMF (PC) and GED (PC). A5 size manual with all the images printed out in high res. and in color when in color. Copyright free. Mac & PC versions.

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"Not only is Provektor a truly European collection of clipart, it is also the best we have seen in terms of breadth of coverage and general image quality. It's all here.", KimTec UK.

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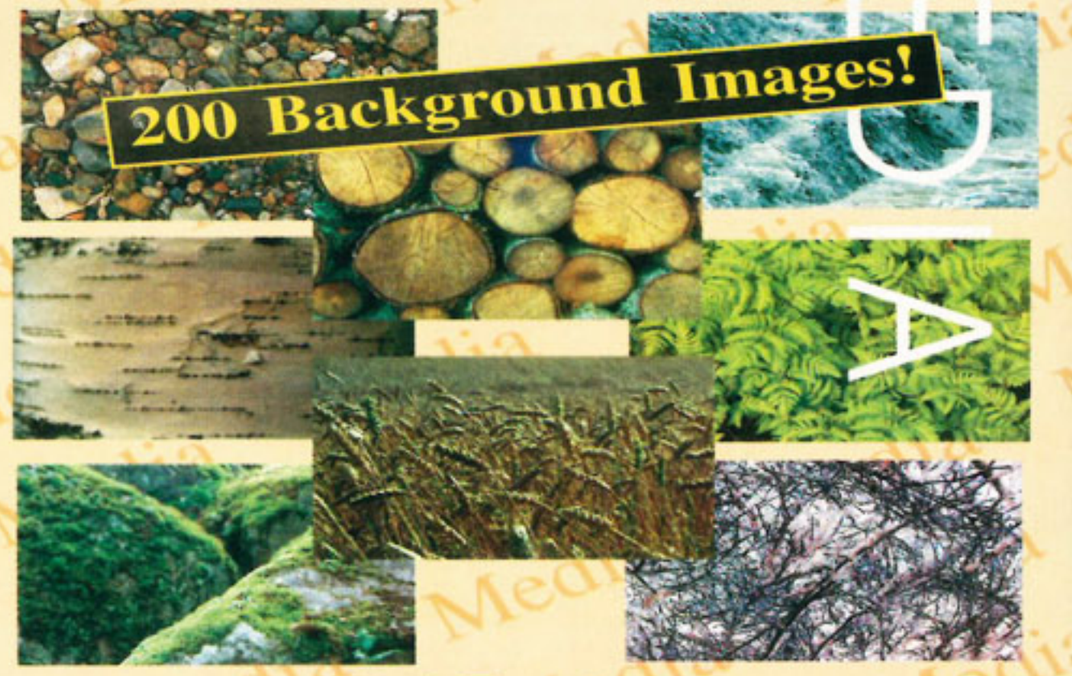
4,032 high quality Postscript images on a CD-ROM. Stored as Freehand 3.0, Illustrator 88 1.1, EPS, PICT, GED and WMF. Copyright free. Includes printed black/white catalog. With Aldus Fetch browser for Mac. CD works with both Mac and PC.

Provektor® M

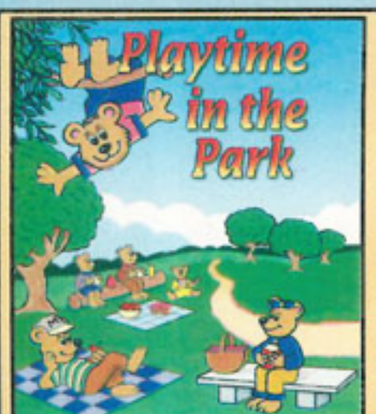
200 Background Images!



£45 +vat

200 screen resolution backgrounds on CD-ROM for Mac and PC. Unlimited usage. 27 x 18 cm. 72 dpi. Stored as PICT and TIFF. For use in graphics, ads, presentations and multimedia. Includes Fetch file for users of Aldus Fetch. CD works with both Mac & PC.

Playtime in the Park



This fun-filled program, packed with music and rhymes, encourages children to return again and again, exploring and learning at their own pace.

By playing games and working through activities, children will master basic word and number recognition, picking up valuable computer skills as they go.

For ages 3 years old and up.

With lots of things to find and do, these bears have fun and so will you.

Hear the word, learn how to say it. Match word to picture, can you play it?

Colour each picture your own way. This game is really fun to play.

Can you join these dots, one by one? You'll see a picture when you're done.

The bear is lost and in a daze. Is there any way through this maze?

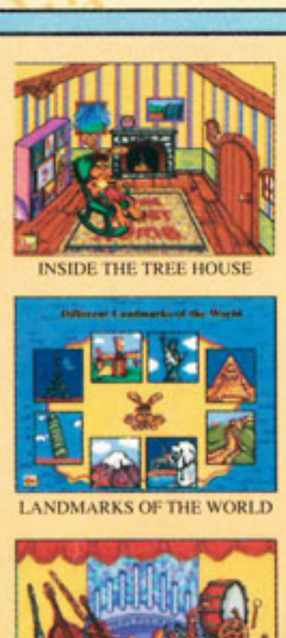
Requirements:

Mac with minimum 4 MB RAM, 256 colours, CD-ROM drive, hard drive, System 6.07 or later.

PC with 386DX processor or higher, mouse and hard drive, 4 MB RAM available under Windows, MPC-compatible CD-ROM drive, SVGA graphics (256 colours), MPC-compatible sound card, Windows 3.1 or higher.

Multi-platform CD-ROM, works with both Mac and PC.

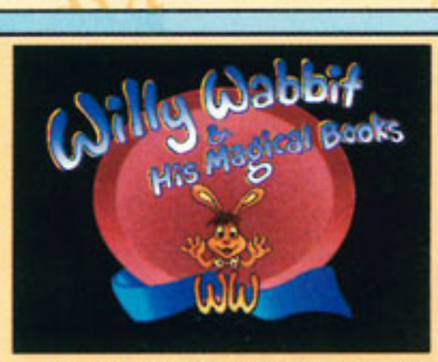
£33 +vat



INSIDE THE TREE HOUSE

LANDMARKS OF THE WORLD

MUSIC HOUSE



Welcome to Willy Wabbit & His Magical Books. This CD-ROM provides a fun and spellbound animated story of a rabbit who lives in his magical wabbit land with lots of whimsical actions, sound effects, great humor and a pleasure for all. Willy Wabbit travels to places and learns things through his magical books. Everything in each book unfolds and comes to life.

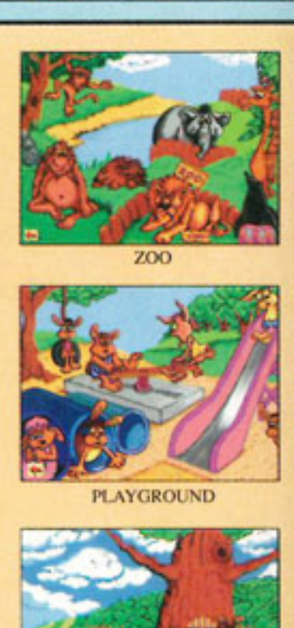
Requirements:

Minimum color Mac LC III with 8 MB RAM.

MPC Level 2 PC with 486DX processor or higher, mouse and hard drive, 8 MB RAM, MPC-compatible CD-ROM drive, SVGA graphics (256 colours), MPC-compatible sound card, Windows 3.1 or higher.

When ordering, specify Mac or PC version.

£33 +vat



ZOO

PLAYGROUND

OUTSIDE THE TREE HOUSE

SEC

To order, contact:

CD-Direct, Tel: 0800-317 864 or 0703-455 115, Fax: 0703-453 231
KimTec, Tel: 0202-88 88 73, Fax: 0202-88 88 63
OpTech, Tel: 0252-714 340, Fax: 0252-711 121

Distributors contact: CD-Information Systems, Staffan Hillberg, Fax: +33-1-48 82 41 08 or +46-31-11 26 17

Multimedia – what is it?

The multimedia revolution, forecast for so long, has finally arrived. Andy Storer investigates what it is and how you can create your own productions.

Imagine a seamless blend of text, graphics, animation, video, sound and music. Imagine a presentation, for example, that not only gives you the text of President John F Kennedy's famous words about putting a man on the moon, but also shows you a film clip of him making the speech as well. "Nothing to it," you say. "And nothing very exciting: sounds like any *Open University* program so far." But imagine you also had the option to access background information at the click of a button, so you could watch film of the moon landing itself, or JFK's assassination. History not your style? Then imagine you had not just a CD of Peter Gabriel's music, and not just video clips, but you could explore his studios, remix his tracks, even view his home movies – and you were in control. Now *that's* entertainment. And that's multimedia.

Multimedia is all about blending graphics, sound and video, and doing it interactively. Over the page, you'll discover what's possible with this new technology in MACFORMAT's top ten current multimedia titles. But it doesn't stop there. You can use your Mac to create your own multimedia extravaganzas. The set-up you'll need depends on what you want to do, from creating a straightforward mixed media presentation using *HyperCard* to producing interactive stand-alone applications using *Director*. The multimedia revolution is here, and you can be a part of it.

Past and future...

Macs have always been renowned for their graphics capabilities. And of course, the Mac was the first desktop computer with sound. What's more, it's the easiest thing in the world to record voice, special effects and music via your Mac's built-in microphone port. With the introduction of Apple's *QuickTime* system in 1991, even video became a reality, with all Macs becoming able to take advantage of high quality video and audio digitising hardware and finally handle video display within documents. All the elements of multimedia were there, ready and waiting.

All it needed was some form of 'authoring' environment, capable of pulling together pictures, clips and sounds in a seamless way. Apple's innovative *HyperCard* had the potential – and on page 36 you'll discover just how easily it rises to the challenge – but it is perhaps fair to say that it was never developed and marketed to exploit these innate capabilities. Authoring relied on expensive packages like *Director* and *Authoware*, placing true mixed media production beyond most people's pockets.

And even then one final problem remained to be overcome. High quality graphics, video and sound samples take up huge amounts of storage space. Enter CD-ROM. Enter Apple with a consistent policy of eschewing short-term profit to sell top-notch double-speed drives at cost price. Enter 1 million Apple CD drives sold worldwide last year and a growth curve of 60% until the end of '94.

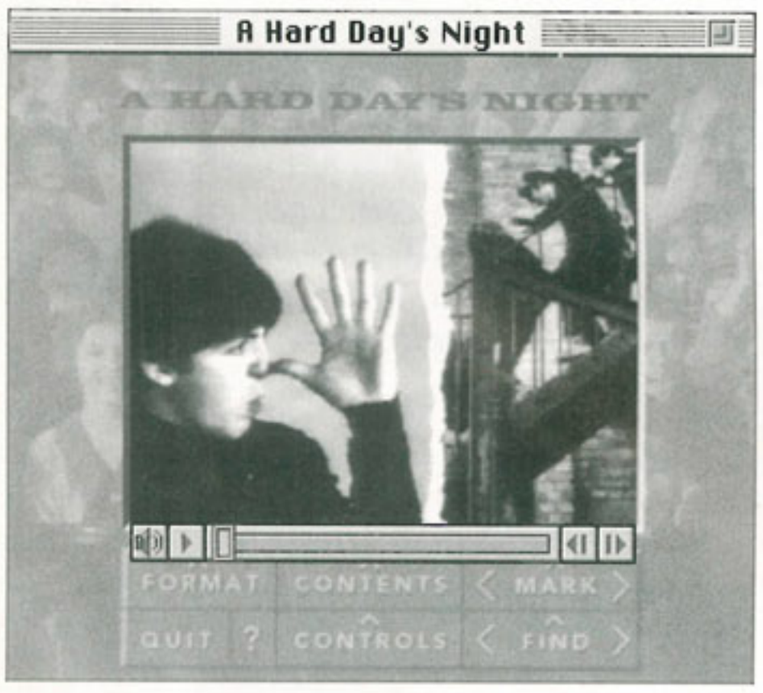
So, in 1994 Mac multimedia has finally come of age. And I'd lay even money that by 1996 you'll be able to buy a low-cost Mac which will hook up to your TV and display full-screen video and sound. It'll have a Finder which works via Ask and Tell rather than Point and Click; it'll feature applications which you customise yourself with a set of functional tools; and you'll use them to create programmes rather than documents. For all intents and purposes, you'll have a desktop TV studio. How do I know? Easy: the various multimedia technologies involved are either already here or well into development. And you can see what this multimedia driven future will be like, right here and right now...

Multimedia – what can it do?

It's still early days in the multimedia revolution, but the promise shown in today's titles bodes well for tomorrow. Sales of CD drives are going through the roof – last year saw a 170% growth in UK shipments, with Apple predicting a home market of 65,000 drives by the end of this year, up from only 18,000 in 1992. However, what you can do with them still depends on how powerful a Mac you've got. It's only when you play multimedia CDs on a fast Quadra or PowerMac that you realise their true potential. Titles which struggle to barely move on an LC, fly along as though your mains lead's plugged directly into the local nuclear power plant. Against this background, here's MACFORMAT's top ten titles – each one rated at over 90% and representing the state of the multimedia art...

A Hard Day's Night

The first full-length feature film by the Fab Four is now the Mac's first mop-top micro movie; *A Hard Day's Night* contains the entire footage from the wacky scousers' legendary film, plus a whole bunch of additional ephemera never previously released. Despite being displayed entirely in black and white (well, it was originally shot in mono) the conversion to *QuickTime* works well enough. While it may not be your idea of fun to watch all 90 minutes on a Mac monitor, it's nevertheless a great piece of nostalgia for all those who remember the early '60s, and a curious anomaly for those who don't. It may be limited as far as interactivity is concerned, but it's still incredible that so much footage can be crammed on to a small silver platter.



Revel in '60s nostalgia with *A Hard Day's Night*, the CD-ROM of the film created by that little-known band from Liverpool.

- Price: £41.13.
- Requires: *QuickTime*-compatible Mac, 4Mb of RAM, System 6.0.7 or later, 256-colour (13-inch or larger) monitor and CD-ROM drive.
- For more details contact Softline on 081 401 1234.

Art Gallery

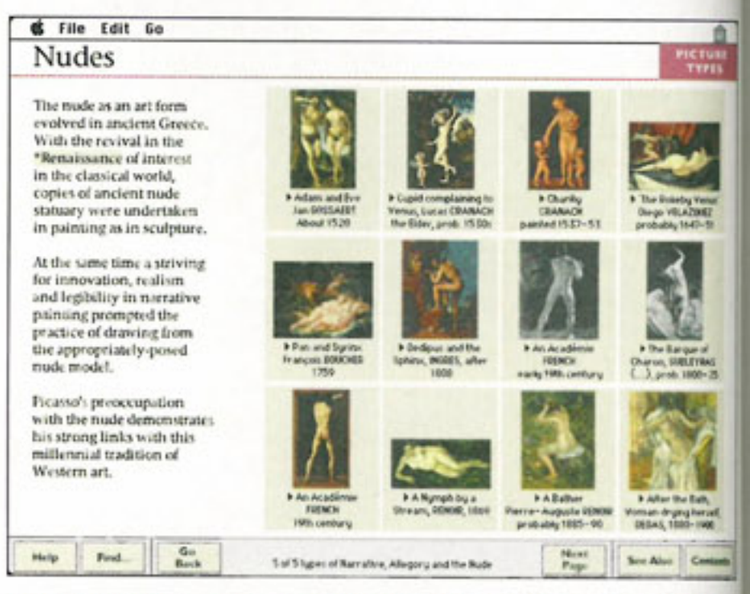
The best of Microsoft's sorties into the home edutainment market, *Art Gallery* is an interactive guide to the pictorial treasures of the National Gallery in London. While rumour has it Microsoft paid just £150,000 for the complete rights to a significant chunk of our National Heritage, don't let misplaced nationalism stand in the way of buying this fine title. *Art Gallery* has it all – well, everything one of the greatest galleries in the world has to offer, at any rate. Its comprehensive browser and built-in tutorials will save you a lot of trips around the marbled recesses of the real thing. Expertly conceived and flawlessly executed, *Art Gallery* stands out as one of the best multimedia titles you can buy.

- Price: under £50.
- Requires: LCII or above, 4Mb of RAM, System 6.0.7 or later, 256-colour (13-inch or larger) monitor, 1Mb of hard disk space and CD-ROM drive.
- For more details contact Microsoft on 0734 270001.

BlindRom

I guarantee you won't have heard of this unless you're well up on the obscure Dutch art magazine, *MediaMatic*. Authored entirely in *Director*, this CD is so off the wall that it stands out a mile from the carefully coded order of most US wares. A collaborative effort by various European artists, musicians and animators, *BlindRom* is pure, free-form experimentation – chaos is the only order in evidence here, and random fun is quite clearly the name of the game. Bizarre text messages, way out video clips, crazy collages of obscure images, insistent back beats and wild interactive buttons make *BlindRom* a constant source of curious diversity. Although there's no defined purpose here – no edutainment factor, other than the pleasure of pure indulgence – it's a ROM you'll come back to again and again just to sample the ferocious flurry of disparate ideas

For weird, purposeless diversity, look no further than *BlindRom*, an off the wall European experiment.



Forget blisters – peruse the National Gallery's works of art without venturing from the comfort of your own chair.

- Price: approx £10.30 (this includes a copy of the *MediaMatic* magazine).
- Requires: Centris, Quarda or better, 4Mb of RAM, System 7 or higher, colour monitor and a CD-ROM drive.
- For details on how to get a copy of *MediaMatic* with the free *BlindRom* disc write to: *MediaMatic*, Postbus 17490, 1001JL, Amsterdam, Holland.

Hell Cab

Like the *Journeyman Project*, *Hell Cab* is probably one of the best adverts for 8Mb memory SIMMS and RISC chips ever invented. But it goes beyond even these luxuries; to do justice to leading graphic novelist Pepe Moreno's multimedia vision, you really should have custom graphics accelerators on-board too – preferably dual DSP chips with 4Mb of VRAM and a quadruple speed CD drive thrown in for good measure. Let's face it, this crawls along on a 840AV, but that's probably more to do with the fact that it was authored in *Director*. Cheap frivolities aside, though, *Hell Cab* really shifts in the video, graphics and audio departments, as it puts you in the role of a modern Faustian adventurer being literally driven round the twist by a New York cab driver with a distinctly devilish demeanour. While technical limitations may constrain the full force of the concept on show, there's no denying the wit and wonder crawling through the wreckage of today's hardware. Tomorrow, this will be a classic.

- Price: £49.34.
- Requires: any Mac with a 150kb per second transfer rate, 3Mb of RAM, SVGA graphics monitor with 256-colour display and 640 x 480 resolution, Mac compatible sound card and CD-ROM drive.
- For more details contact Computer Manuals on 021 706 6000.

Your aim in the *Journeyman Project* is to save the Earth's history from sabotage by sources unknown...

Journeyman Project

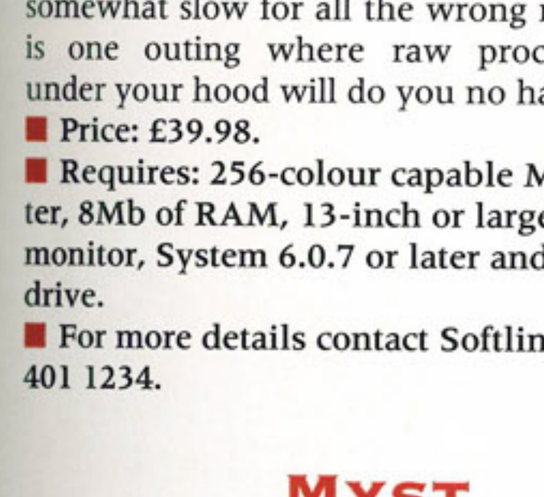
If you want to assess just how advanced this whole area of multimedia has become, CD games are a good place to start – and they don't come much more ambitious than the *Journeyman Project*. With over half an hour of specially shot video footage, the name of this game is space exploration, and the scale is massive. With over 400Mb of 3D images, hi-fi stereo and a branching storyline, the only limiting factor is whether you have enough time to complete it. By combining both arcade action and the mind games of traditional adventure fare, *Journeyman* has certainly set the pace for future Mac multimedia games. And that pace ironically has been somewhat slow for all the wrong reasons – this is one outing where raw processing grunt under your hood will do you no harm at all.

- **Price: £39.98.**
- **Requires: 256-colour capable Mac II or better, 8Mb of RAM, 13-inch or larger colour monitor, System 6.0.7 or later and CD-ROM drive.**
- **For more details contact Softline on 081 401 1234.**

Myst

Computer adventure games have come a long way since the text-only outings of the early '80s – to be precise, they've come exactly this far. There's no text at all, just screen after screen of the best examples of 3D modelling you can buy in one package. *Myst* is a sumptuously presented interactive mystery, set in an ocean-side mansion which contains more hidden secrets than Bill Clinton's diary. It scores with its fantastic attention to artistic detail, rich atmospheric soundtrack and surfeit of puzzles and strategic reasoning. Likely to keep you hooked for hours, *Myst* is the nearest thing to Virtual Reality, without the encumbrance of a full-length, force-feedback body suit. When VR technology finally merges with the likes of *Myst*, the world will be full of missing persons, whose last actions in this world involved placing a sign on their doors saying, 'Do not disturb'. Compulsive isn't the word.

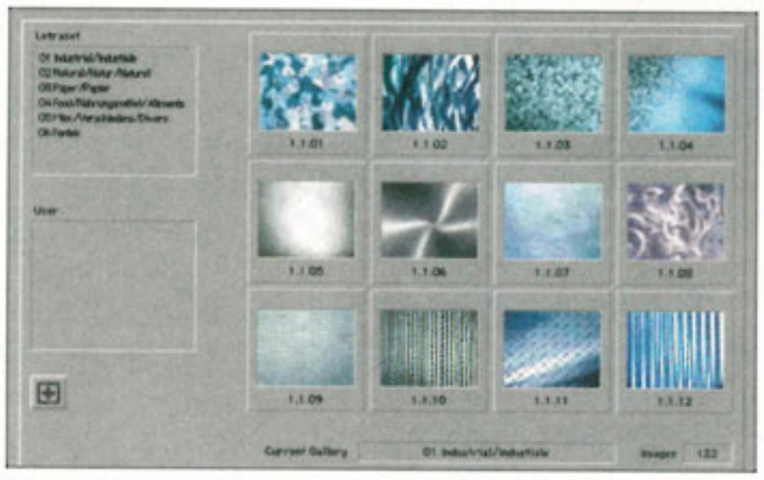
- **Price: £44.99.**
- **Requires: LCII or better, 4Mb of RAM, System 7 or higher, 256-colour display and a CD-ROM drive.**
- **For more details contact Electronic Arts on 0753 549442.**



Myst's sumptuous graphics and intriguing storyline make it an excellent example of CD-ROM gaming at its best.

Phototone Backgrounds

No round-up of multimedia titles would be complete without at least one collection of clip images, and here they are – all 564 of them squeezed into one top-notch package. OK, so *Phototone Backgrounds* doesn't sing and dance, but it's an easy-to-use browser, consisting of some great high resolution photos, which can be freely used in your own multimedia productions. The disc also contains 210 screen fonts from Fontek. If you need abstract clip images, then look no further – and even if you have no immediate need for the range of textures on offer here, you can rest assured that you'll have enough desktop backgrounds to last you a good 18 months... at the rate of one a day.



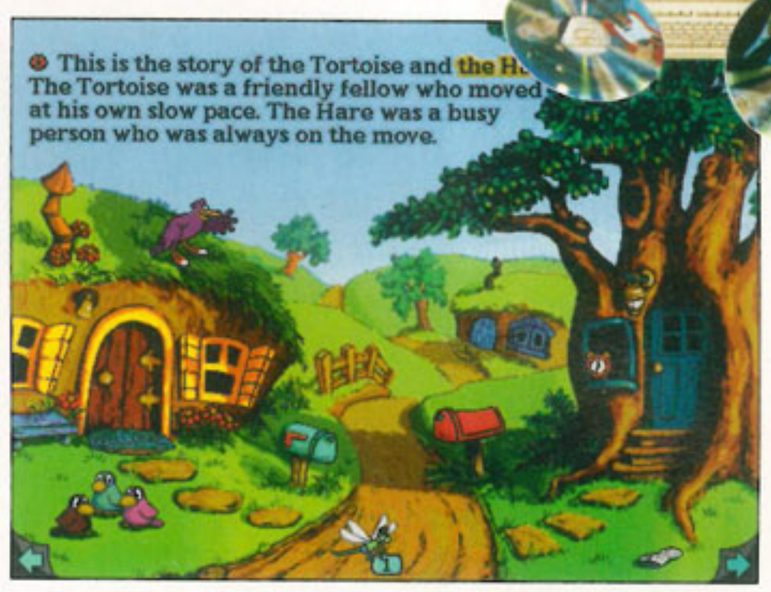
You will never want for another background again with this extensive collection of 564 clip images.

- **Price: £58.75.**
- **Requires: any *QuickTime* compatible Mac and a CD-ROM drive.**
- **For more details contact Letraset on 071 928 3411.**

RedShift

This, the ultimate astronomer's guide, shows just what multimedia is all about when it comes to educational entertainment. *RedShift* enables you to view any part of the galaxy, from any viewpoint over a ten thousand year period – and it'll even make *QuickTime* videos of your travels. Add to this a range of real video footage taken from various satellites, lunar orbiters and lunar vehicles, and you're looking at a CD which is a damn sight more fun than standing out in your backyard on a cold winter's evening. *RedShift* is well presented, and its programmers have clearly taken a lot of time and trouble to ensure the accuracy of its astronomical data. It bridges the age gap neatly, and adults, as well as kids, will find its fascinating glimpses of the Really Big Outdoors an endless source of interest.

- **Price: £79.**
- **Requires: LCII or above with colour monitor, 4Mb of RAM and a CD-ROM drive.**
- **For more details contact Maris Mulitmedia on 071 488 1566.**



The Tortoise and The Hare is a beautifully produced interactive storybook that will keep youngsters enthralled.

The Tortoise and The Hare

The best of Broderbund's Living books series, *The Tortoise and The Hare* is a superb interactive cartoon adventure, featuring colourful, first-class animation. Full of talking characters hopping and skipping across finely rendered backdrops, this disc is a must for anyone with a child under seven. I'd even go so far as to say it's worth buying a CD drive for this title alone; its high production values and attention to detail make it the current state of the art in animation. At once educational – it helps children with reading – and fun. Even the sourest cynic won't fail to crack a smile. One can only look forward to more releases from the same stable.

- **Price: £39.99.**
- **Requires: LCII or better, 4Mb of RAM, System 6.0.7 or higher, 256-colour display and a CD-ROM drive.**
- **For more details contact Electronic Arts on 0753 549442.**

Xplora 1

I was initially a little disappointed when Peter Gabriel first ventured into the Mac market with *Xplora 1*. However, it is a beautifully produced title, which showcases what can be achieved when music, video and images are merged with purpose. It's a seamless mix of the man's music videos coupled with a tour of his studios, a chance to remix one of the tracks from *Us*, organise a jam session and explore the full extent of the code on offer through a form of interactive adventure. The synching between video and music fails occasionally, but the programming is otherwise very professional. You'll probably already own it if you're a fan of his, but it's worth a look even if you're not.

- **Price: £39.78.**
- **Requires: any colour Mac with 3Mb of RAM (4Mb or greater recommended), 256-colour or better display, System 7 and a CD-ROM drive.**
- **For more details contact Softline on 081 401 1234.**

Multimedia – what

Whatever multimedia production you're using – or thinking of creating yourself – whether it's a business presentation, educational title, training package or interactive game – the key components you'll need will probably be comprised of the various pieces of hardware you can see on these pages. Each draws on the Mac's sophisticated, built-in media handlers – 256 colours, moving video, stereo sound and fast SCSI data transfers. Central to everything, of course, is the Mac itself. The model we've featured here is a Quadra 660AV, which can now be bought for as little as £1,200 with 8Mb of RAM and a CD-ROM drive. This machine is ideally suited to multimedia work, because it features integrated video and audio sampling hardware, and is fairly fast at processing the massive data throughputs which this kind of work inevitably involves.

Video capture

However, you don't need built-in AV facilities to capture and manipulate audio-visual materials; there's a wide range of video capture boards on the market starting at around £500, and all new Macs come with built-in sound import facilities. It's just that at the moment the 660AV is a real bargain, especially when you consider how much you'd have to pay if you were to buy its AV features as add-on boards for a standard Mac. Of course, the easiest solution for existing Mac owners will be to buy a PowerMac AV upgrade board for their machine; this will give you the benefit of an even greater processing performance *and* custom multimedia hardware – all for an extremely competitive price.

All the essential kit for a Mac multimedia set-up is illustrated here; we've omitted professional add-ons (you'll find them in the 'What's Missing' box below) and what we're left with is a selection of readily available and affordable hardware, which is ideal for small office and home use.

HANDICAM

Unless you have an AV machine, you'll need a video digitiser to import video footage into your Mac. These are connected via a NuBus card, and enable you to sample material at up to 24-bit rates, depending on the quality of your hardware. But unless you have a very fast Mac, don't expect to sample at anything like full-motion or 25 frames per second. On most machines 15fps is more typical, and even then you'll be forced to opt for a video window which is, at most, half the size of your Mac screen. However, given the necessary input hardware, you can capture both moving and still video images for display in any *QuickTime* compatible application.

STILL VIDEO CAMERAS

Both Apple's new QuickTake 100 and Canon's range of still video cams, offer an alternative to colour scanners. Both produce acceptable results for screen productions, but care must be taken if you're intending to print the material professionally, because the cameras produce relatively low resolutions, when compared to a scanner. This low res will also constrain the size of the video images you can use – the smaller the window, the better the image. Having said that, they provide a handy means of capturing 'real world' material, although again, you'll probably be better off exploring Kodak's *PhotoCD* alternative if you want to use higher quality photorealistic images.

SCANNER

A scanner is probably the most commonly-used input device in multimedia productions; it's a must when using artwork or any 2D material – and colour scanners are now more affordable than ever. Choose a 24-bit, flatbed colour model to capture the true colours of the original document. However, if your multimedia piece is only intended to run on a Mac screen (rather than as, say, a VHS recording), scanning at your Mac's 72 dpi screen resolution or thereabouts should be fine. To convert transparencies, though, you'll need to scan at a higher resolution to maintain crisp clarity.

What's missing

In theory, Quadras and PowerMacs have all the necessary hardware to act as studios for full-blown, interactive TV productions, featuring full-motion, full-screen video with a CD-quality soundtrack. But that capability – like the extra components you'll need to realise your Mac's potential – comes at a price.

First of all, such a desktop studio would require at least 16Mb of RAM (24Mb would be preferable), and then there's hard disk capacities. A rough rule of thumb dictates that you should allow 10Mb of storage space for every second of full-motion video – so you can see that hard disk space quickly gets eaten up.

But it's not just size which counts. The speed at which data can be accessed and pumped around your system is also crucial. For this reason, you need to look at a hard disk array (a pair of linked disks) of probably two gigabytes in total, capable of sustaining a constant throughput of around 5Mb of data per second. This is so that no frames are dropped when full-screen, full-motion video is being digitised. And then there's the question of the kit required to pull in that material.

Here you're looking at dedicated hardware like Radius's VideoVision Studio, a NuBus card and breakout box combination, which will enable video to be pulled in at almost broadcast resolution. Finally, this ultimate system would include a desktop CD-ROM recordable drive so you could do you own mastering.

Total price for this lot – including the Quadra and an optical drive for back-up? About £18,000. And that's before buying the software. But wouldn't you just luurve one?

do I need to do it?

MONITOR

Although the Apple AudioVision monitor (better known as the AV) featured here, is the bees knees when it comes to crisp colour and high fidelity sound, it only provides part of the solution. In a nutshell, at just 14 inches, it's too small. Unless you're using a quick and easy authoring application, like *HyperCard*, you'll need either a second monitor attached to your Mac, or a display of at least 17 inches. This is so you can permanently display both the programming portion of applications like *Director* and *Premiere*, and the output results simultaneously. There is nothing worse than having to keep on moving windows about to reveal your work-in-progress. However, if you do opt for a larger monitor you'll probably have to buy additional video memory to display 16 or 24-bit colour. This aside, the AV remains a good choice.

SOUND

If you don't own an AV monitor, then you might like to check out the AppleDesign Powered Speakers. Jokes about making a sound investment aside, these are ideal speakers for near-field listening, providing crisp highs, clear midranges and rich bass. They can be connected either directly to your Mac or attached to a CD drive to transform audio output beyond recognition. Better still, they can be bought as part of the Apple Multimedia Kit bundle with a CD300 drive for £349.

CD-ROM DRIVE

Apple's CD300 is the best unit on the market at the moment, offering fast access times at a bargain price. A CD drive is essential – after all, it is the future of all software distribution. And all the best multimedia titles appear on CD.

Apple's CD drive is *PhotoCD* compatible; this means you can shoot regular film with an SLR camera, get it processed, then transfer the images to the high quality *PhotoCD* format. Once you've done that, you can manipulate the photos in image editing applications, before importing them into multimedia authoring software. With a CD drive, you can also automatically sample your favourite pieces of music and special effects directly from within any *QuickTime*-editing application. No additional audio hardware is required.

THE CPU

The Mac at the heart of a multimedia system needs to be at least a 68030-based machine (a SE/30, LCII or similar) with 5Mb RAM. While this is the minimum configuration for any system capable of playing CD-ROM titles, 8 to 12Mbs RAM (or even 16 to 20Mb) is optimum – as is a Quadra or PowerMac. This is because large colour, video and audio files all demand significant processing and storage overheads.

So, with its 33MHz, 68040 processor and Digital Signal Processor chip for audio sampling, the 660AV is a good choice – particularly with Apple's AV monitor option. On the back of the 660AV are video input and output jacks, which you connect to any TV or video with a composite video or S-VHS input. By using the 660's **Monitors** Control Panel, you can easily re-route screen output to the device of your choice. This makes it possible to record live presentations and add voice-overs as you go, just by using the regular microphone input jack.

Perhaps the AV range's best feature, though, is its custom video and audio circuits. The motherboard's integrated analogue to digital (A/D) convertor circuit enables you to digitise *QuickTime* movies without a third-party board and display full-screen video at the broadcast rate of 25 frames a second. What's more, this same A/D convertor coupled with the DSP chip means that you can record and play sound at 16-bit, 44KHz rates: the equivalent of compact disc quality.

VIDEO RECORDER

The distribution format for a multimedia product is determined by the level of its interactivity. If a project requires any input from you, you're looking at mastering a CD-ROM – a basic, non-interactive linear presentation only requires output to video.

CD-ROM production is best left to a bureau unless you have your own desktop recordable CD-ROM drive. Output to video is easy if you have an AV Mac – it's a question of configuring the **Monitors** Control Panel to direct playback to a TV or VTR connected to the AV's video output port. Work-in-progress and results can be checked on a TV connected to the video recorder. Bear in mind, that a TV screen has a larger aspect ratio than a Mac screen, so unless you have software which supports overscan, you'll have a smaller Mac output window in the middle of the TV display. Mac owners without AV facilities will need to buy a video encoder card, which converts the Mac's display signal to a composite video output.

Multimedia – how do I do it?

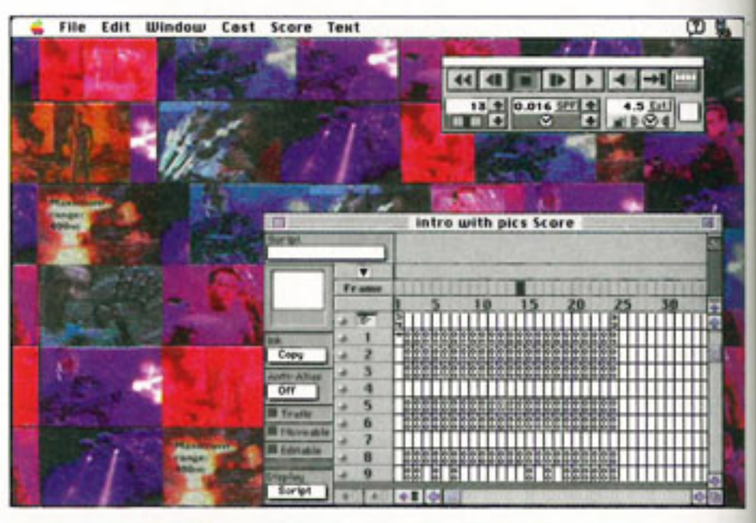
Once you have the right kit to capture video and sound, and the software to produce graphics, text and animation, you may want to take a crack at creating your own multimedia production. In order to do this, though, you'll need authoring software. The packages available range from the cheap and easy to the hard and expensive – there is no compromise. Either you go for a friendly package, with a shallow learning curve and limited functionality, or you buy Macromind's *Director*.

If you go for the latter, you'll probably end up spending more hours than you thought possible in front of your Mac, with rest sessions spent reading *Director's* hefty manuals sandwiched in between. You may well be in the process of mastering the most powerful interactive media application ever devised – but you'll have spent nearly £1,200, and the wife or husband you've neglected will be vengefully planning the demise of your new piece of kit. Of course, you could console yourself with the fact that you didn't fork out £4,400 for *Authorware Professional* (*Director's* main competitor) – but after all the *Director*-related grief, you may wish you'd stuck to *HyperCard*.

That said, multimedia production can be a lot of fun. If you want to have a go, there are a few things you should know, starting with the three main types of authoring package...

1. Multimedia sequencers

While *Director* is the best known example of a multimedia sequencer, presentation packages like *Astound* and *Passport Producer* are also capable of performing this task. Each of these applications involves you in placing media elements – pictures, video clips, sounds, etc – on separate channels, which run along a time-base. Editing tools enable you to sequence these elements precisely; they also include special effects to produce transitions (such as fades) between elements. You can achieve interactive control by making certain areas of the presentation's graphic elements respond to mouse clicks – so clicking on a picture will run a movie clip, for



Macromind's *Director* offers excellent handling of all kinds of text, graphics, sound and illustrations.

instance. More sophisticated control based on timed transitions is also built-in.

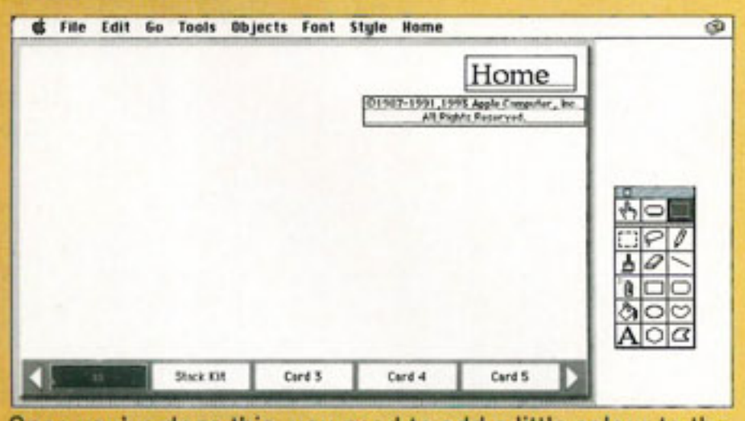
2. Flow chart modellers

Both *Authorware* and Apple's *Media Tool* take the following approach: elements are placed

CREATING AN INTERACTIVE MAGAZINE IN HYPERCARD...

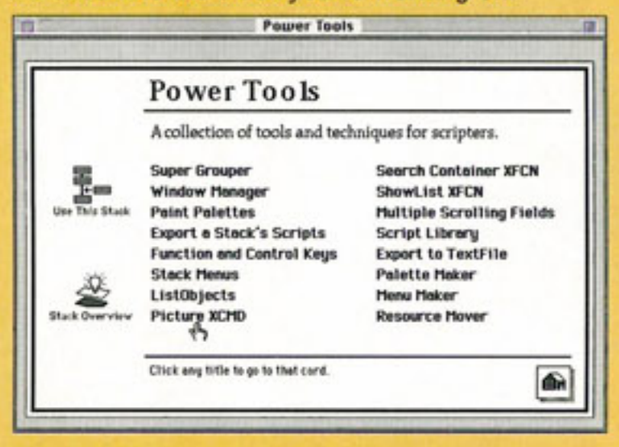
The first step in putting anything together in *HyperCard* is to decide what size cards you're going to master on. We're using cards which are the same size as the Mac screen, but you could easily set the dimensions of your cards to any custom ratio.

The next part of the process is to place controller buttons on all cards, which ensures you'll have a common front-end running throughout the entire stack. You can achieve this by designing a standard background. We chose to adapt *HyperCard's* Home Stack, because it includes all the navigation tools we're likely to need – after all, why re-invent the wheel?

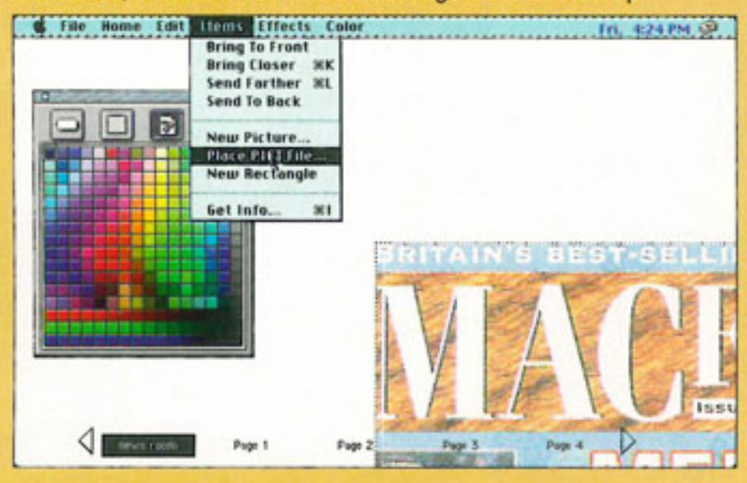


Once you've done this, you need to add a little colour to the proceedings – this can be quite tricky, because *HyperCard* doesn't include full colour support. But this is how we got around the problem. First, to create a suitable backdrop, we scanned in last issue's cover and loaded it into *Photoshop* to lower its brightness and contrast levels. At this stage we could have resized the scan to fit the dimensions of our cards (full-screen size), but that would have looked peculiar, so we chose to use a portion of the image as a consistent background instead.

Once you've prepared your PICT image, you need to load in a special set of external functions, so that *HyperCard* can display 8-bit colour. The Picture XMCD stack contains the code to do the job, and its resources need to be installed into the stack you're working on.



This is done automatically when you re-open your stack, then it's simply a question of selecting **Background** mode and using a file selector to locate the PICT you want to use. Once the image is on-screen, all you have to do is drag it into the desired position and switch out of **Background** mode. All the stack's existing cards, and any added at a later date, will now feature this image as a backdrop



Once you've got your backdrop in position, you can import your foreground objects – in our case, thumbnails of the four news pages. What you need to do is place a button on the opening card, so that when you click on it, *HyperCard* will load in the thumbnails to their preset positions. If you wanted the pictures to load automatically, you could make these commands part of the script of the first card in the stack. All the script does is load the images and display them at set positions in a set form – you can choose from a variety of window styles. A further command entered in the button's script simply detects whether the mouse has been clicked within a window, and tells *HyperCard* to display the next card.

So for example, if we now click on the news room button, *HyperCard* will show the thumbnails of each news page.

What we wish to achieve here is a close-up of the selected news page, so that when we click on the thumbnail on the contents card, *HyperCard* will take us to a readable image of that news page. In order to do this, we need to return to *Photoshop*, add a sharpen filter to the image, and import it back into *HyperCard* on a new card. But before doing this,

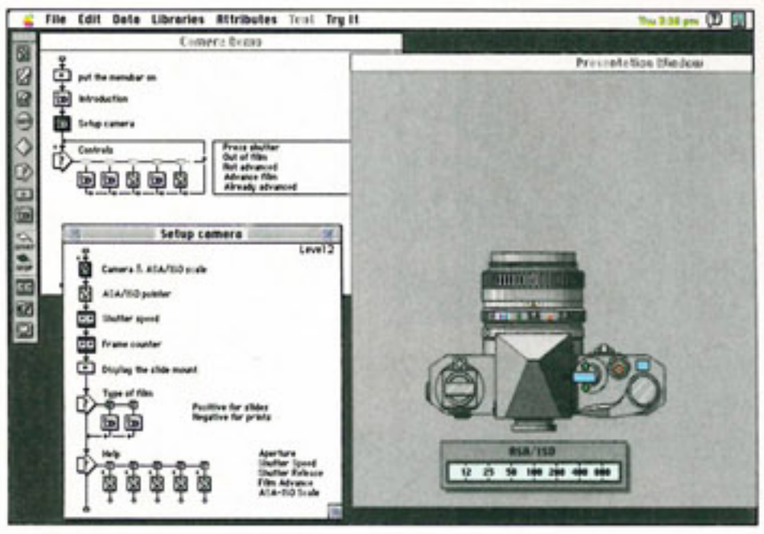
within a flow charting schematic. Lines of flow between elements are placed, edited and tested as a tree-branching diagram. This kind of approach is perhaps best suited to interactive training productions, because the branching model lends itself ideally to multiple choice questions and answers. On the down side, though, all those links and branches can become awfully confusing.

3. Card-based databases

HyperCard, *SuperCard* and *HyperStudio* are the best examples of this, the easiest method of multimedia authoring. Productions, based on stacks of interlinked cards, can be quickly and easily put together, using button-based interactive links. While card-based databases offer the fastest means of combining a range of media, the lack of any overview window showing the full extent of how elements are associated means that this approach is best suited to less complex and less lengthy projects.

To show you how multimedia authoring works using a card-based database, we've created... an interactive magazine! (See box below.) In order to do this, we've taken the news pages from MACFORMAT's last issue and added in a bit of low-level multimedia to illustrate a few points of authoring. We've used *HyperCard* as an example of a cheap and easy production platform – we could have used *HyperStudio* or *SuperCard*, but *HyperCard's* been around the longest and it's still the easiest to use.

All the screenshots you see here were scanned with an Epson GT6500 colour flatbed



Authorware is a professional multimedia authoring program with which you can write multimedia applications.

scanner. While this is a very capable machine (it can scan at 600 dpi in 24-bit colour and produces very acceptable results for its price), it can't scan anything larger than A4 – which was a bit of a problem as MACFORMAT is printed at Super A4 size. So, some judicious cropping was called for. Once we'd scanned the four pages of news, we had to resize the scans to fit a 14-inch monitor and change their resolution to the 72dpi of a Mac monitor. Fortunately, having *Photoshop* in the office made this a breeze, but we could have just as easily used a low-cost image editing package like *ColorIt*.

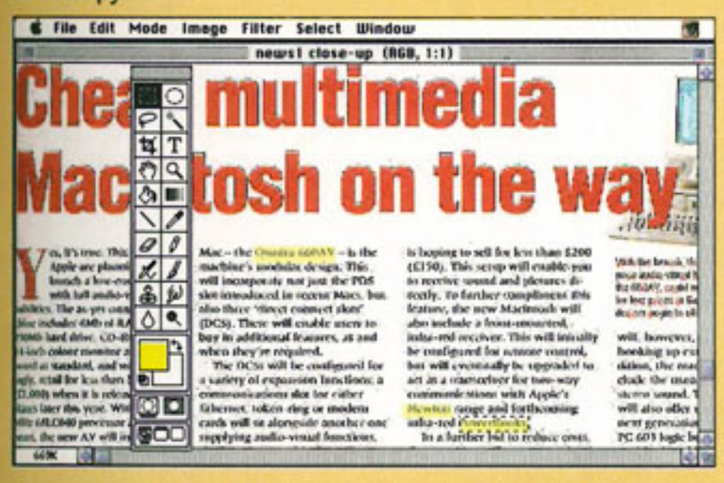
Working in this way – deciding on media elements and assigning buttons to activate them – is a straightforward enough process, and it does yield good results. But *HyperCard* does have certain limitations. For instance, it would have been preferable to have the close-ups of the news pages as scrollable pictures, enabling a viewer to navigate his way around the stories. Try as we might, though, we couldn't find a way to do this (although, as with everything else in the world of this wonderful program, there's bound to be some shareware author somewhere who's written a little resource which'll do exactly that). Also, it would be really neat if *HyperCard* had rudimentary layout and image editing facilities, to provide an all-in-one service. It's the same story with colour and *QuickTime* – not to put too fine a point on it, these should be fully integrated into the package, not bolted-on as afterthoughts.

Finally, a few thoughts on how this sort of interactive magazine could be improved. Obviously the best solution would be to cut out the scanning altogether to maintain quality. In this case, pages could be designed for screen-only display, including scans with 72 dpi resolution and hypertext colour from the start. Then it would be a simple case of grabbing the screens as PICTs with System 7's built-in screen grabber, and porting them complete into *HyperCard* for card and button assignment.

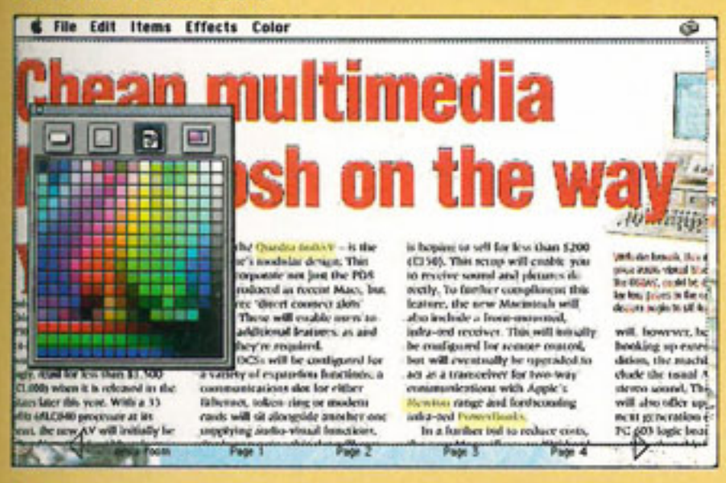
Essential software tools

Well, now you know what the different types of authoring packages do (in particular, the sort of thing that can be achieved with *HyperCard)*, you may be wondering what type of software to buy to produce your own multimedia. This will ultimately depend on your needs and of course, on your budget. That said, the list of essential tools breaks down into three main

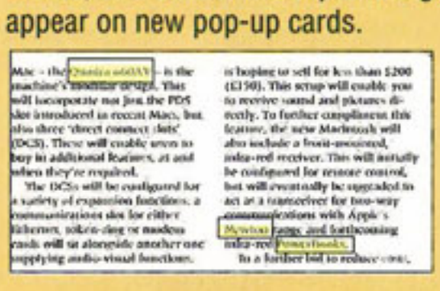
let's add a few hypertext links to the image. These are highlighted areas of text, which will call up further text, graphics, video clips or sounds when you click the button. In order to achieve this effect, we used *Photoshop* to paste some pale yellow boxes over selected text in the original news copy.



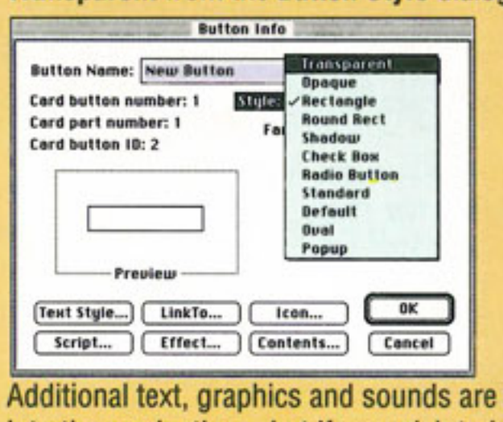
Then we can import the image into *HyperCard* again, using the Colour Tools stack.



Once the pages are in position on the card, we can add invisible buttons over the coloured hypertext links. Now when these are clicked, they will call up associated media elements. These media elements could be more text information, say, on the technical specifications of the Apple hardware we've highlighted; a sound clip of Andy Storer – god help us – waxing lyrical about their relative merits; or a *QuickTime* clip of the gear in action. These will appear on new pop-up cards.

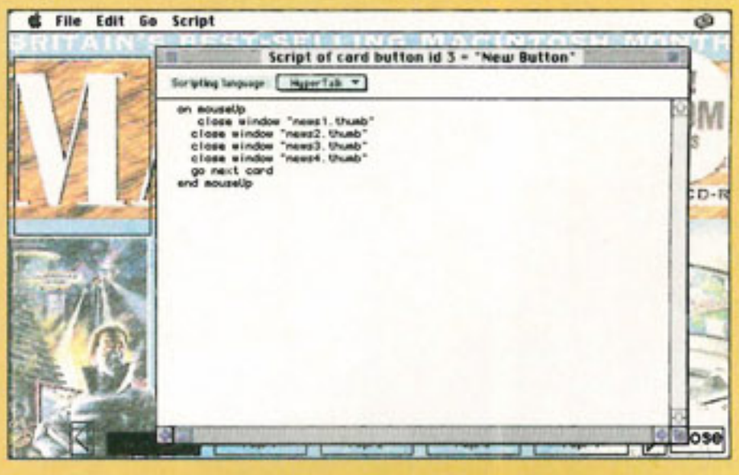


Creating an invisible button is very simple in *HyperCard*; all you have to do is place a button over the text and select **Transparent** from the **Button Style** dialogue box.



Additional text, graphics and sounds are also easily pulled into the production – but if you wish to include a *QuickTime* clip, you'll need to install the necessary resources into the stack. (Why *HyperCard* doesn't include these as built-in functions is a complete mystery, because the video handling in its *QuickTime* Tools stack is quite sophisticated.)

Once the appropriate button has been selected, all you need to do is script in the relevant link to the video clip you wish to play.

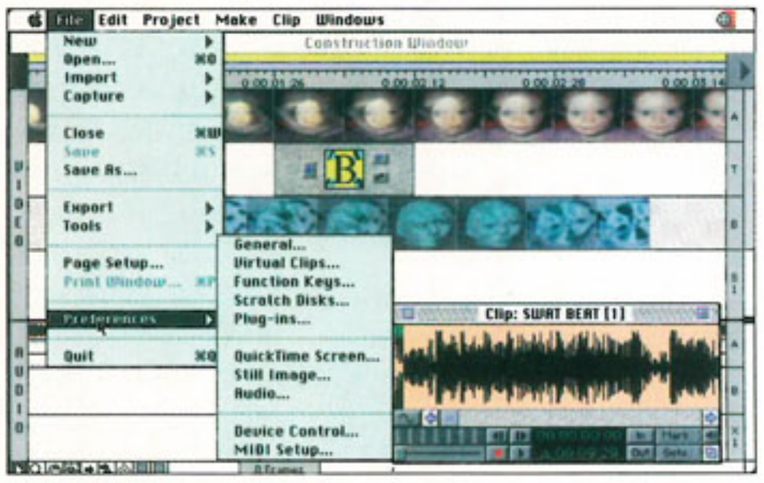


Again, the precise positioning and style of the window is easily scriptable, and once you're ready to test your production, *HyperCard* can run several videos, simultaneously if needed – albeit with some loss of smoothness.

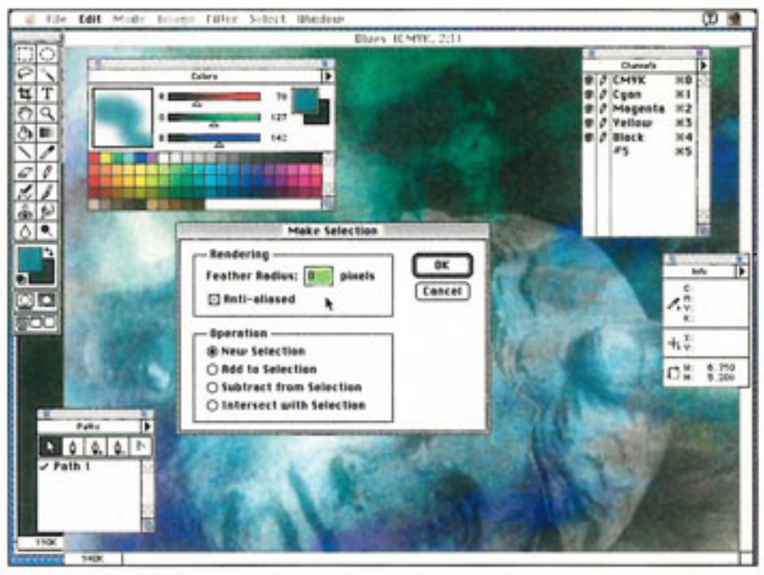
types of software: content authoring, video and audio editing, and graphics handling packages.

Content authoring

Director has to be *the* choice for authoring, although *Hypercard, HyperStudio* and *SuperCard* are all worth checking out if you're on a fixed budget. But *Director* is the preferred and the most powerful application among multimedia developers. This is because it's also cross-platform – meaning you can transfer your work to PC Windows. While it may cost well over a grand, there's nothing to touch it in terms of support for scriptable interactivity, animation, graphics handling, digital video and multi-track audio authoring.



With *Premiere*, you can have an entire non-linear video post production studio on your desktop.



Adobe *Photoshop* really is the undisputed leader in the field of image manipulation – a fact reflected in the price.

Video and audio editing

Adobe *Premiere* is the best video editing application currently available; it features hundreds of built-in filters and effects for capturing, sequencing, editing and outputting digital video. It's also pretty darned nifty in the audio department, with its multi-track sound handling of samples. Otherwise *VideoShop* from Letraset is a good alternative.

Graphics handling

Adobe *Photoshop* is the ideal photo and graphics manipulation package for multimedia work. As far as image manipulation is concerned, there is, quite simply, nothing to touch it – definitely the professional's choice. *Photoshop's* plug-ins architecture is supported by dozens of leading graphics companies. It can also provide additional effects and has direct support for *QuickTime*. Scans, grabs and digitised clips can all be opened and modified for incorporation in both *Premiere* and *Director*.

Andy Storer

WHERE TO GET 'EM

■ Content authoring

Hypercard costs £145. For more details contact Apple on 0800 127753.
Supercard costs £160. For more details contact Aldus on 031 220 4747.
HyperStudio costs £165. For more details contact TAG Developments Ltd on 0474 357350.
Director costs £1,175. For more details contact Computers Unlimited on 081 200 8282.

■ Video and audio editing

VideoShop costs £464. For more details contact Letraset on 071 928 3411.
Premiere costs £495. For more details contact Principal on 0706 831831.

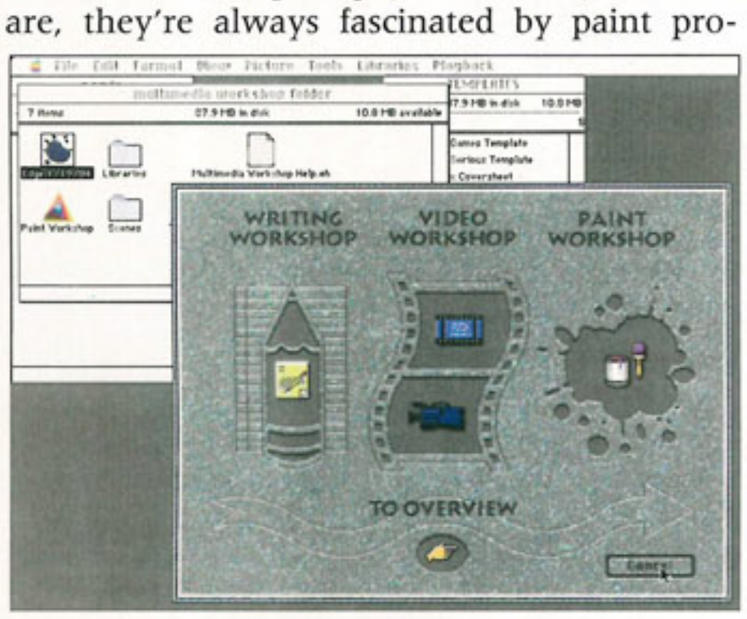
■ Graphics handling

Photoshop costs £725. For more details contact Principal on 0706 831831.

Multimedia Workshop

The soon to be released, *Multimedia Workshop* is aimed at a tricky section of the market, namely educational multimedia. The education sector has been a big market for this type of software ever since the much publicised Doomsday Project, which involved several thousand BBC Model B computers and a small number of LaserDisc players. To succeed in this market, a package has to be easy to use, full of great features and dirt cheap. It's a tricky balancing act.

Multimedia Workshop is split into three broad areas. The first of these is the Paint Workshop. No matter how young (or how old) children are, they're always fascinated by paint programs – and this one is a rather excellent example. It has a wide array of drawing tools, but also includes some features which have been introduced purely for fun rather than because of any artistic necessity. The snowflake function, for instance, draws a random fractal snowflake on the screen, and there's even a fractal tree drawing tool. The completed masterpieces can be saved out in PICT format and then imported into one of the other modules that makes up the package.

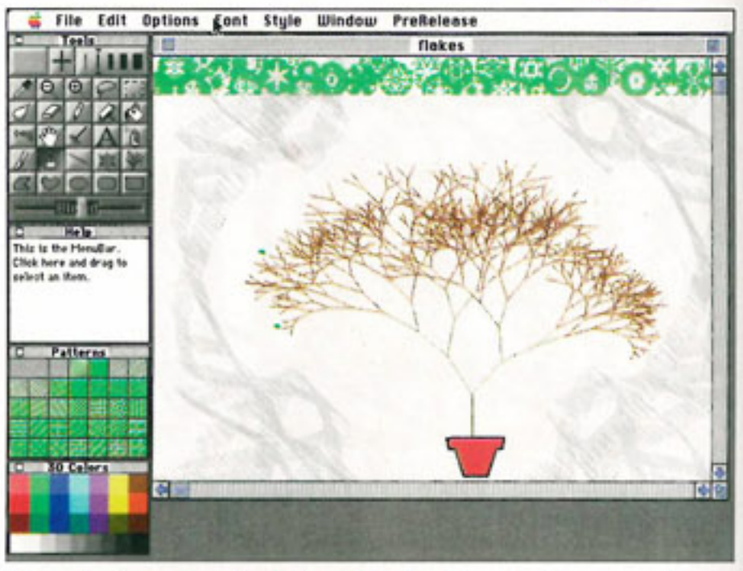


The front-end of the software is really a link to the three separate modules.

The Writing Workshop is a more than adequate word processor for the preparation of school reports, speeches, dissertations, etc. All the usual dictionary, thesaurus, font and style features are present, and, of course, it is possible to load and position graphics within your document. The Writing Workshop is perhaps the weakest part of the whole ensemble, but it still stands up in its own right as a text basher.

The final module, the Video Workshop, is more in the area of what people like to think of as multimedia. This is a presentation system which enables you to link static text, graphics, sound and *QuickTime* video sequences together.

As well as being the most interesting, this could easily have been the most complicated part of the program. Although it is a bit daunting, simply by virtue of all the features available, it should be quickly mastered – especially by the sort of rotten 11 year olds who seem to pick up 'C' programming in an afternoon. Sounds can be recorded directly by the software, so it's very easy to do a voice-over for a *QuickTime* sequence and put together a whole presentation in a matter of minutes.



The paint program includes plenty of fun features, such as a fractal tree drawing tool.

The software is accompanied by a manual, which leads the reader through each stage of each module in a progressively complex manner. The tutorials are set out in the style of projects or assignments; in fact, they could probably form the basis of a complete term's worth of Computer Studies lessons. Watch out for the full review in the very next issue of MACFORMAT.

Nick Veitch

On sale now!

Explore the exciting new world of CD-ROM with a magazine that brings you all the fun and facts in unrivalled style. It's a perfect combination of lively editorial and an action-packed CD-ROM disc for PC and Mac.

But that's not just our opinion. The first issue sold out so fast we had to reprint it, and that sold out too! Try issue two for yourself – it's on sale now.

HyperStudio *revealed*

If you think multimedia authoring is the preserve of the rich, think again. *HyperStudio* is affordable and simple to use – and like *HyperCard*, enables you to do, well, quite a lot really...

Multimedia authoring has traditionally been high-end, time-intensive and expensive. *HyperStudio* makes it cheap, quick and oh-so-easy. Is this the program that *HyperCard* should have been?

HyperStudio enables you to display text and graphics on 'cards', and these cards can also contain buttons to play *QuickTime* movies, take you to other cards, play sounds and do a number of other things. A collection of these cards is a 'stack'.

Sound familiar? It certainly does, doesn't it? We could be talking about *HyperCard* here, what with buttons, cards and stacks. And the name itself – *HyperStudio* – is a bit of a give-away, as is the similarity of some of the icons. But *HyperStudio* is not a rip-off of *HyperCard*. Let's just say the similarities are striking. What's also striking is that an hour's browsing through the documentation reveals only one reference to *HyperCard*, saying that the other program's icons could be used by *HyperStudio*.

But then *HyperStudio* is a very direct competitor to *HyperCard*. They both set out to provide multimedia information handling and presentation. And what's striking is that *HyperStudio* does it so much better. *HyperStudio* is full-colour, even down to the painting tools. It has built-in *QuickTime* movie support, built-in sound-playing and editing support, laser-disc and CD-ROM control, and it even has rudimentary animation.

It's true that *HyperCard* has the ability to do all this and more (except full-colour painting), but these features are only available on separate stacks, often from third-party suppliers; hence with *HyperCard* your multimedia system will end up not as a stand-alone application, but as an elaborate structure of shared stacks.

Producing multimedia documents and presentations in *HyperCard* is not especially difficult, but it's not especially easy, either. Not once you've seen and used *HyperStudio*, at any rate. Why, oh why, can't all software be this easy to use?

The question is how do you incorporate all these wonderful sights and sounds into your Mac documents? Well, *HyperStudio* makes it about as easy as it could possibly be. You can read text directly from external files into fields on your cards. You can also import external graphics straight on to your cards. To incorporate a *QuickTime* movie, all you need to do is create a movie window and place it where you want it. Path-based animations are as easy as half a dozen mouse clicks, and cel-based animations are as simple as creating a window and finding the first file. It's all a piece of cake really. If you thought multimedia was complicated, think again.

Easy multimedia

The latest version of *HyperCard* can do just about all these things (except the colour paint features), but you have to hunt around the supplied stacks and get involved in fairly heavy stack-sharing set-ups to do it. With *HyperStudio*, multimedia is like stepping into a car and turning the key. In *HyperCard*, you have to build the car first.

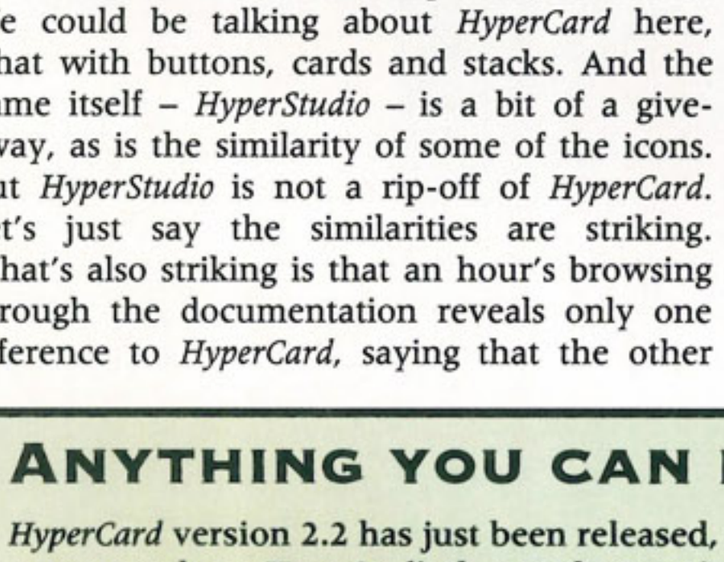
It's swings and roundabouts, though, be-

ANYTHING YOU CAN DO...

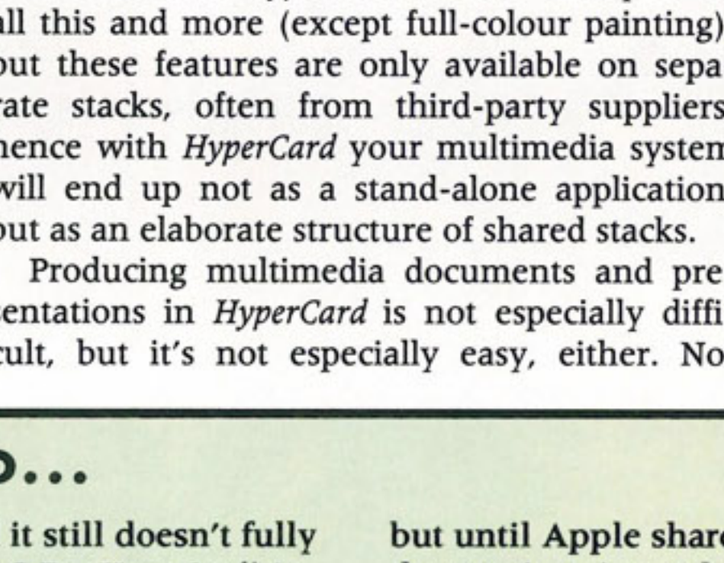
HyperCard version 2.2 has just been released, and it still doesn't fully support colour. *HyperStudio* does. What's going on? Do *HyperStudio*'s programmers know something *HyperCard*'s don't?

No doubt there are very good technical reasons why *HyperCard* has not been dragged kicking and screaming into a full-colour world, but until Apple shares the reasons with us, anyone who compares the two is going to be more than a little impressed with *HyperStudio* and somewhat disappointed with *HyperCard*.

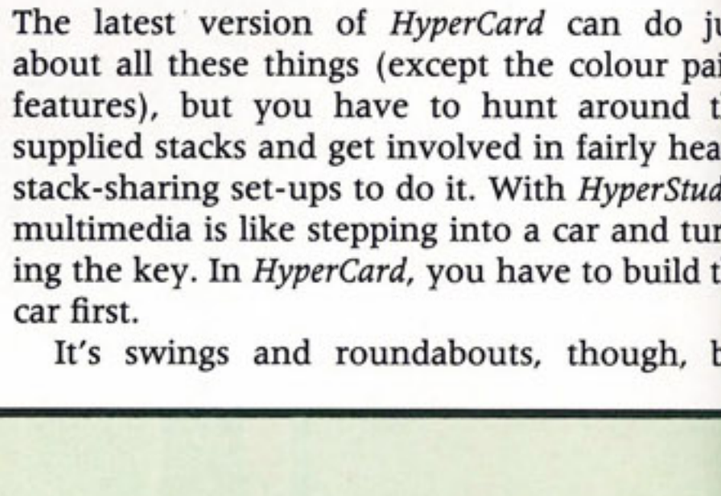
It comes down to more than just colour support, though. For a long time now, *HyperCard* has been synonymous with multimedia



256-colour paint tools on tap! If you like, *HyperStudio* can double as a paint package – it can even import and export standard PICTS.

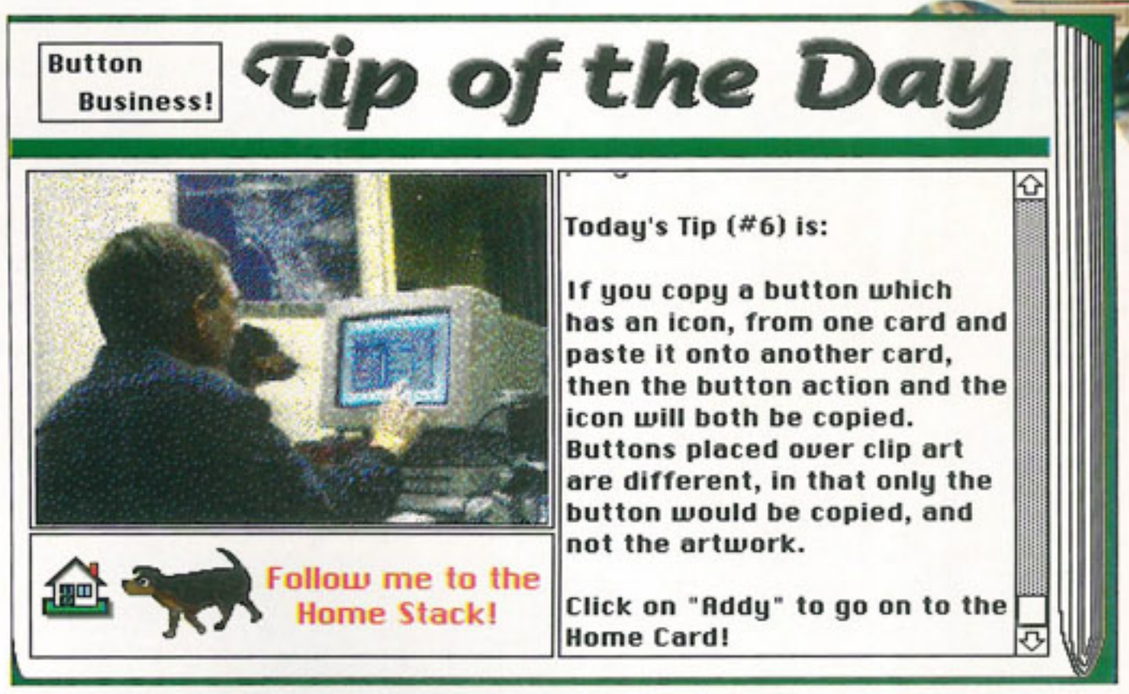


This sound-editing dialogue is similar in features to *HyperCard's*. However, *HyperStudio's* is built in and readily accessible.



HyperStudio can handle hypertext – the linking of certain 'hot' words to other cards. However, this feature is much less sophisticated than *HyperCard*'s abilities – one respect in which *HyperCard* is clearly far more powerful.

See that musician? He will launch into a short musical interlude when you click on the little movie icon on the left. This comprises a short, jerky, blocky interlude on a low-end Mac.



Here's a nice little touch. Whenever you launch *HyperStudio* it offers a 'tip of the day' selected randomly from a list it presumably keeps stored somewhere. No, really, it's not at all tiresome.

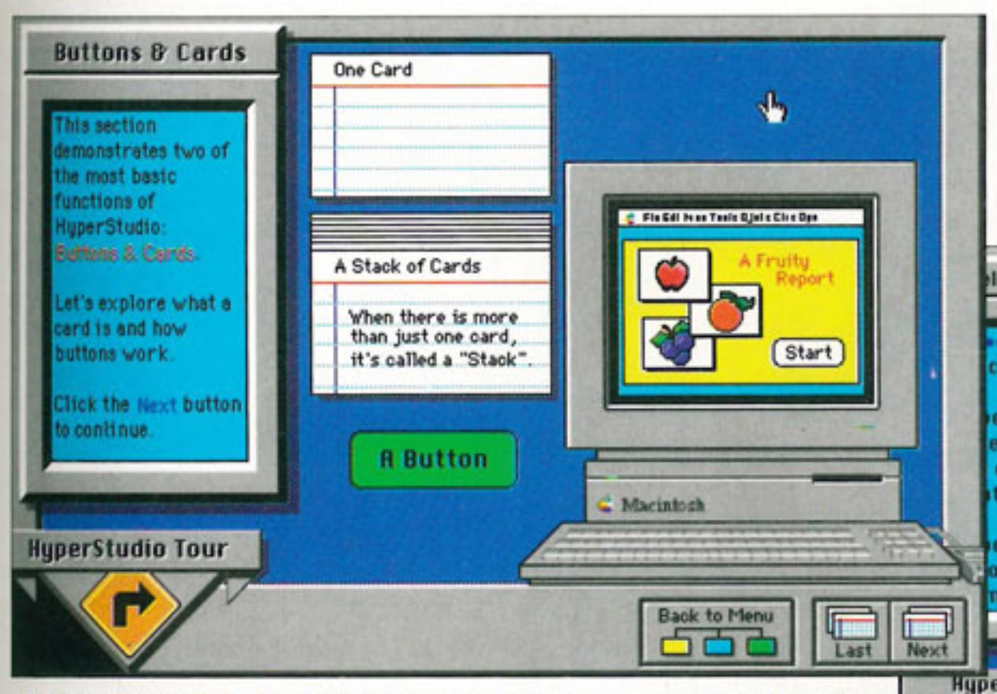
cause while *HyperCard* is clunkier at handling simple multimedia presentations and products, it is a vastly more powerful system designed to do far more things. *HyperCard* can launch applications, store and manipulate complex information and it makes a pretty mean relational database, too. And you can use it to write extremely useful utilities and applications. *HyperCard* is a custom software construction kit. *HyperStudio* is just a program for producing multimedia documents.

So who needs *HyperStudio*? The program is published by American company Roger Wagner Publishing, and appears to be aimed at the educational field. Certainly, most of the sample *HyperStudio* stacks included with the program were written by students.

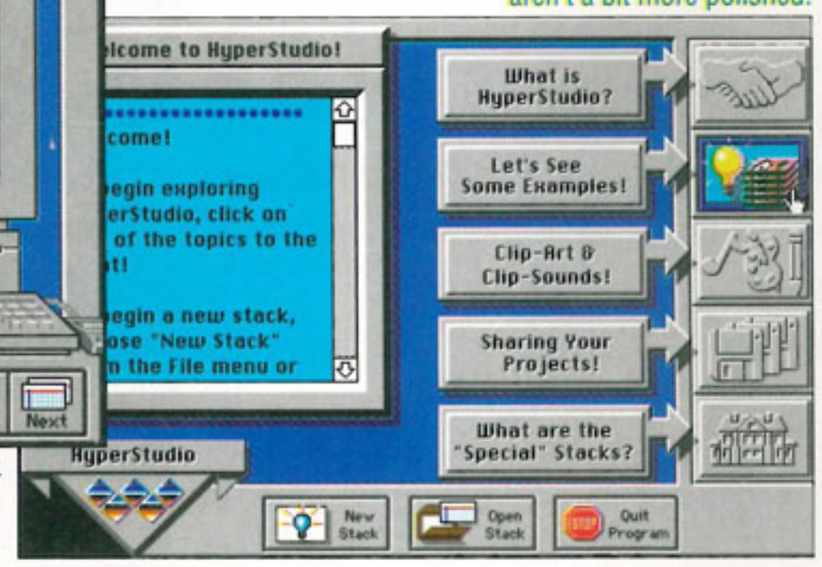
These suspicions are confirmed when you take a look at the tutorial, which is simplistic and patronising (unless you're a kid.) However, this is backed up (literally – it's a double-sided manual) with a reference guide explaining what all the menu options do in a language adults can bear to read.

The educational bias is further demonstrated by the inclusion of a built-in scripting language, *Logo*. This is (or was) popular in schools, and nowhere else. *Logo* is like a powerful automated drawing tool, which is more useful than it sounds, but unfortunately, it suffers from hellish syntax.

But if you can ignore the obvious educational bias and – it has to be said – the amateurish look and feel of the documentation and box, this is a serious multimedia tool. You can't help feeling that by pitching it at the educational market, the publishers are missing out on a much wider audience. *HyperStudio* has to be just about the easiest entry into multimedia techniques you can get. OK, if it's designed for kids, it has to



This is helpful, a little *HyperStudio* tour showing how a stack is put together with cards, buttons and so on. If you've seen the *HyperCard* tour, you'll know your way around.

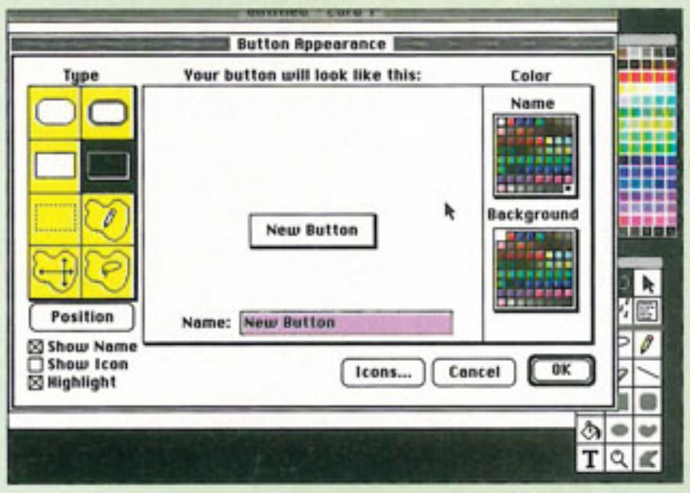


HyperStudio is a very friendly program. And if you've been born and raised on *HyperCard*, all that colour is utterly stunning. It's just a pity the example stacks aren't a bit more polished.

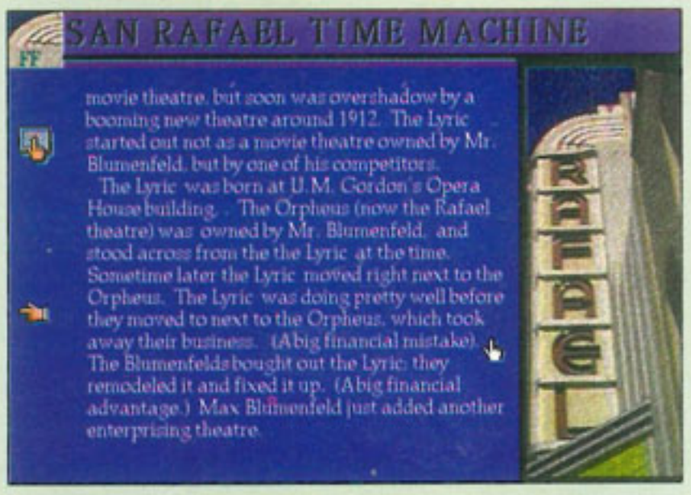
on the Macintosh. True, oodles of third-party support has meant that there's not much that *HyperCard* can't do. *HyperCard* is not just a program, it's a structure on which you can 'hang' whole new applications and extensions. But you do end up with a complex and unwieldy system of 'shared' stacks that's pretty terrifying if you don't know your way around *HyperCard*, and more than a little unsettling when you do.

HyperCard can do pretty well anything *HyperStudio* can. The difference is that *HyperStudio* has it all built in. In the world of low-end multimedia, *HyperCard* has blown it. Big time.

And here we have a card describing the parrot. We reached it by clicking on the word 'parrot' in a text field on another card. That's hypertext in action – *HyperStudio* does it, but *HyperCard* does it better.



HyperStudio's buttons come with a range of pre-defined effects. They can also have icons, be square, rectangular or freeform, and even invisible.

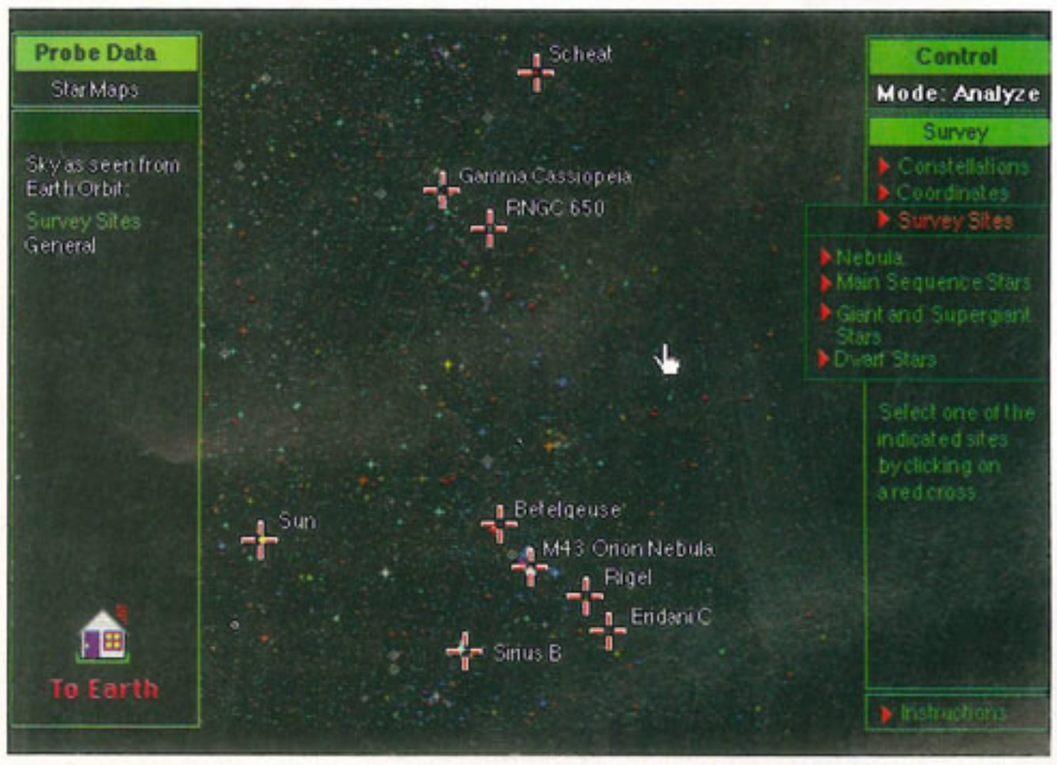


Want to add a bit more polish to your text? *HyperStudio* has a 'New Button Action' (this NBA is comparable to *HyperCard's* XCMDs), which will scroll text in a field.

be. But let's face it, what's good for kids is good for struggling adults, too. With the increasing acceptance of CD-ROM as an information medium, multimedia publishing is becoming a big business. In five years' time we might all be using multimedia authoring software instead of word processors. Well, why not? After all, an advertising agent can do a much better sales pitch with a five minute multimedia presentation modemed down the phone line to a client's machine than with a paper document that takes two days to arrive and is about as interactive as a plank of wood.

So, why buy *HyperStudio*? Well, if you want to get into full multimedia quickly and easily, it's the ideal solution – it's certainly a less expensive alternative to the *Directors* and *PassPorts* of this world and it's far simpler to use. Of course, it's not going to have all the features of a fully blown multimedia package. But it can handle text, graphics, animation (both cel and path-based), sound (recording and playback) and *QuickTime* movies. It can also control LaserDisc players and CD-ROM drives. Oh, and it also has built-in paint capabilities in up to 256 colours, as well as a built-in programming language, which is ideal for graphing and basic 3D modelling.

It's really a rather simplistic piece of kit – any hope that the apparently simplistic documentation will reveal hidden depths soon vanishes. *HyperStudio* is a program that does a few very simple things. But these simple things, used together, offer immense potential. They are your key to the infinite and amazing world of multimedia. Need another reason? Well, then you must be bonkers. *Rod Lawton*



The sky's the limit; this sample stack of a star map illustrates just what you can do with a bit of imagination and of course, *HyperStudio*.

What can HyperStudio do?

Case 1: You want to compile a pictorial database of all your company's employees? Easy. Set up a card for each one, import a digitised picture of their happy, beaming faces and create a button that prompts a few seconds of digitised speech. Each card could also contain a text field announcing the subject's position, role, hobbies and so on. And if you've got plenty of disk space, you could chuck in a *QuickTime* movie showing them at work in their office.

Case 2: You want to produce a stack showing you how to strip down your car's engine. Assuming, of course, you've already taken and digitised the photos, you can create a stack that gives you an overview of the whole engine, with transparent buttons placed over all the components. Clicking on the carburettor, for example, takes you to a card showing you how to dismantle it (though not how to put the pesky thing back together again). If you're feeling smarmy, you can include a short path-based animation showing the float bowl lifting off. Projects like this are limited only by the space available on your hard disk, available RAM – and your patience.

Case 3: You've got a huge collection of classical music from dozens of different composers. Each composer could have a card of their own, with a digitised picture and another set of buttons taking you to specific pieces of music. These secondary cards could contain a text field telling you a bit about the music's history, some background art from that era and one or more buttons playing samples of the music. Piece of cake. If you were particularly ambitious, you could include a bit of music theory, using a graphic of a piano keyboard and some interactive fingers...

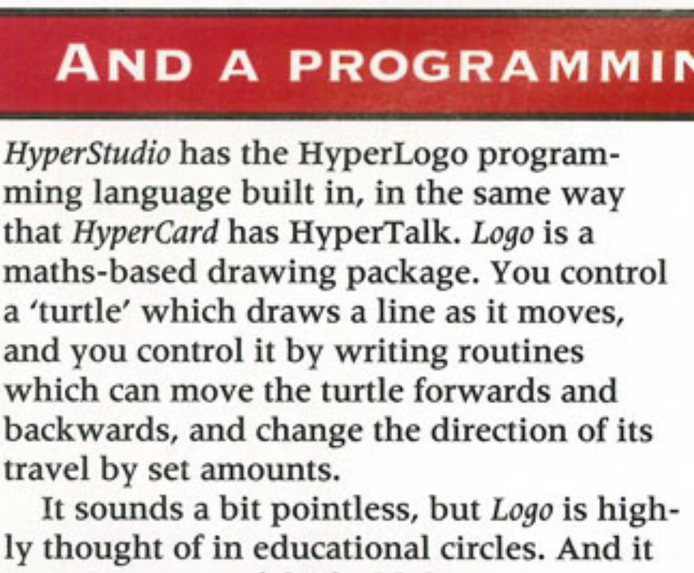
AND A PROGRAMMING LANGUAGE, TOO...

HyperStudio has the HyperLogo programming language built in, in the same way that *HyperCard* has HyperTalk. *Logo* is a maths-based drawing package. You control a 'turtle' which draws a line as it moves, and you control it by writing routines which can move the turtle forwards and backwards, and change the direction of its travel by set amounts.

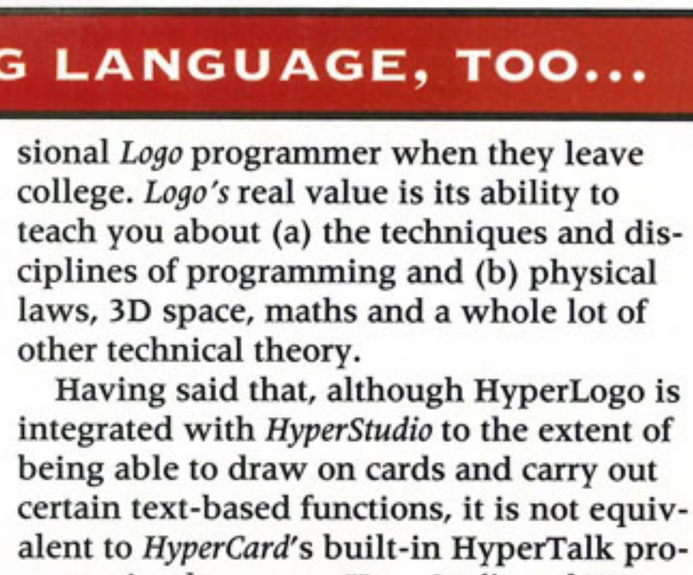
It sounds a bit pointless, but *Logo* is highly thought of in educational circles. And it is quite a powerful, if odd, language. What's particularly interesting is its 3D mode, whereby you can create and manipulate 3D vector images. And that includes the ability to view them from any angle.

No-one's going to get a job as a professional *Logo* programmer when they leave college. *Logo's* real value is its ability to teach you about (a) the techniques and disciplines of programming and (b) physical laws, 3D space, maths and a whole lot of other technical theory.

Having said that, although HyperLogo is integrated with *HyperStudio* to the extent of being able to draw on cards and carry out certain text-based functions, it is not equivalent to *HyperCard*'s built-in HyperTalk programming language. *HyperStudio* and HyperLogo are two educational tools bolted together. *HyperCard* and HyperTalk are a seamless and infinitely more powerful blend of multimedia information handling and object-based programming.



HyperLogo may look like the world's daftest language, but it will let you produce charts...



... And even rotateable three-dimensional vector graphic models! This molecule might be propane. We think.

HYPERSTUDIO

Price: £165 (home users); £99.95 (education); 5-user packs, £494 or £299.95 respectively.
Requires 2Mb RAM (System 6); 4Mb RAM (System 7).
For more details contact TAG Developments Ltd on 0474 357350.

Ease of use 85%
Couldn't be easier. The manual's a bit patronising, but the software is simple yet powerful.

Documentation 58%
A bit cheap and tacky. Otherwise informative, if a bit twee.

Features 95%
Everything you could wish for (or that I can think of) in an elementary multimedia program.

Value for money 90%
Excellent. You're also getting software that can manipulate sound, graphics and text files.

MACFORMAT RATING 91%

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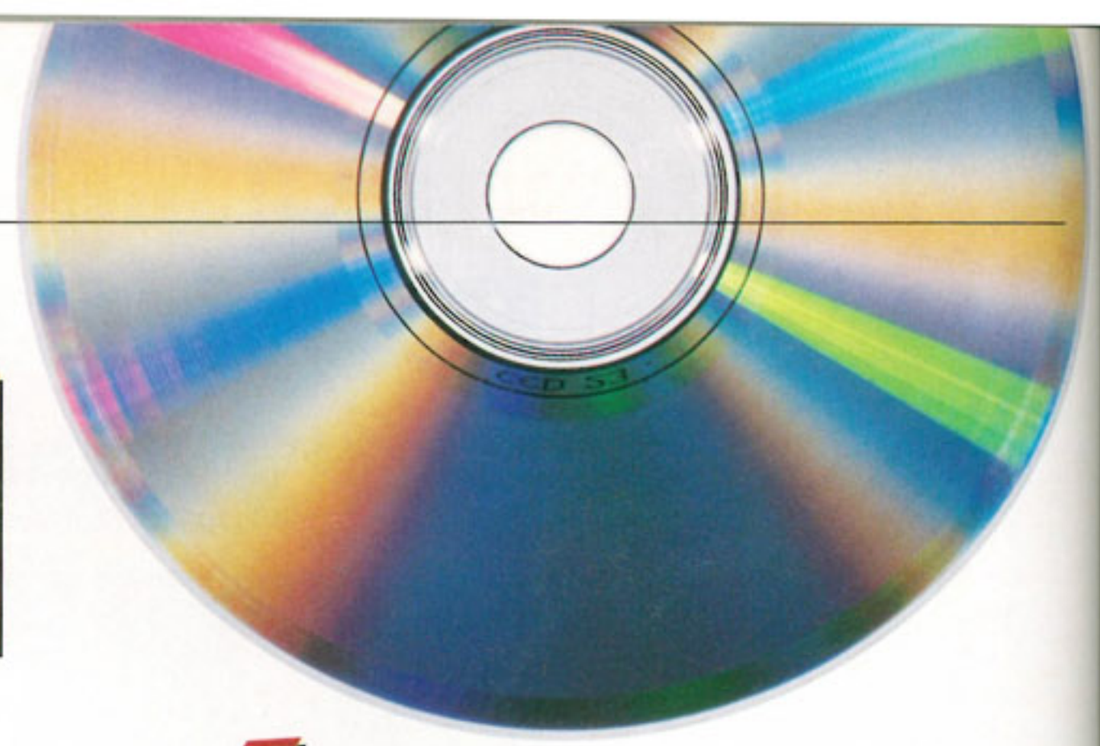


the basics

CD-ROM discs can store huge amounts of data and make multimedia possible, but how do they work and what do all the facts and figures mean? Matt Richards scratches the surface of the disc.

CD-ROM is old technology. The discs used for storing data are exactly the same as standard audio Compact Discs, which were introduced by Philips in 1981. Yet, while CDs have succeeded in tipping vinyl LPs into the dustbin marked Obsolete (along with Betamax videos and the Government's 'Back To Basics' policy), the CD-ROM (Compact Disc – Read Only Memory), its computer equivalent, has taken a lot longer to catch on.

It's really only in the last year or so, with increasing demand for ever more complex games, educational and consumer software titles, that developers have taken to the format. And how! In recent months the CD-ROM has swung from relative obscurity to explosive growth.

How it works

The way CD-ROM drives essentially work is amazingly simple. Computer data is stored as a series of numbers made up of 1s and 0s. The drive spins the disc and shines a light on its surface. At each point on the disc, light may be reflected or 'unreflected' to indicate a 1 or 0. But if you hold a disc up to the light, the whole thing looks reflective, so what's the difference?

Well, this is where things get just a little more technical. The light source in a CD-ROM drive is a laser beam. The important thing about this is that lasers only emit light of a single wavelength and all the light waves are in phase (more on that later). The light is focused on to the compact disc by various lenses and a prism; the reflections are then read by a light-sensitive diode.

The disc itself is laid out in a long spiral track – a bit like an LP record. The only differences are that the CD-ROM's track starts at the centre and works its way out towards the edge, and that the track is so narrow that if you stretched it out in a straight line, it would be about three miles long!

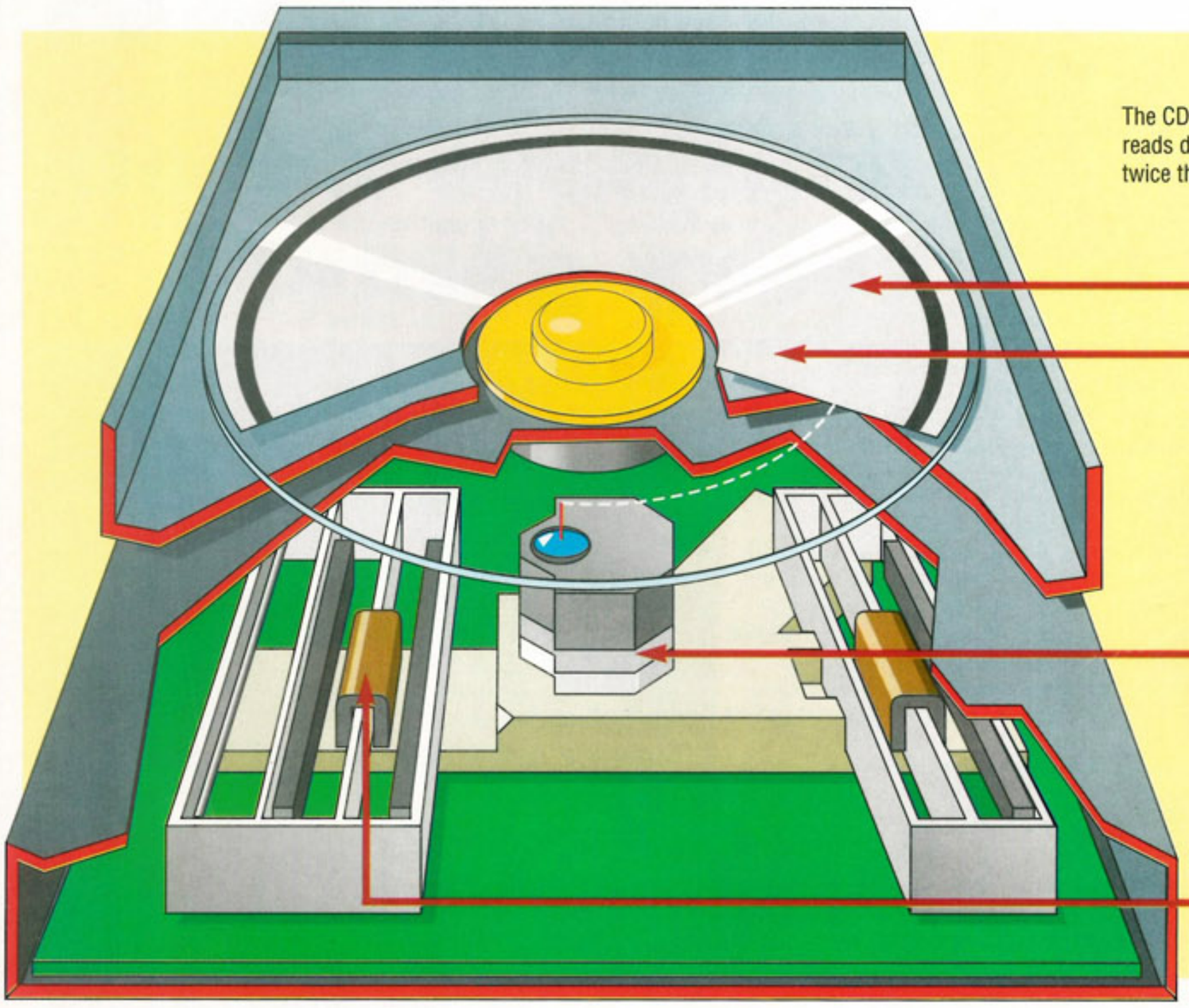
As with an audio CD, the production process of a CD-ROM disc involves etching the surface of the data track to produce a series of tiny bumps. The resulting irregularities on the surface are called lands and pits, and it's these that cause the refracted colours you see when you hold a disc up to the light.

Seeing the light

When light from the drive's laser strikes a land, it's reflected back in phase through the prism to be registered by the light-sensitive diode. Pits in the disc's surface, however, are just under 200nm (nano metres) deep – or one quarter of

CD-ROM UNIT

The CD-ROM unit is mechanically similar to an audio CD player and reads data in the same way. However, newer drives spin the disc at twice the speed (or faster) to speed up data transfer.



the laser light's wavelength. As light is reflected back, it is out of phase (because of the extra distance it had to travel into the pit). This creates a cancellation effect, so almost no light reaches the light-sensitive diode.

As the disc spins, the lands and pits are converted into the 1s and 0s of computer data by the light-sensitive diode. The optical assembly (laser source and read diode) scans data along the length of the disc's track. A Table of Contents at the start of the track, similar to that on a hard disk, tells the drive where to look for specific pieces of data, and a servo motor moves the assembly to the correct position.

The actual data-reading speed has to be uniform across the surface of the disc. As the disc naturally spins faster towards the edge than at the centre, the main motor must be synchronised to vary the spin speed in step with the position of the optical assembly – effectively slowing the spin speed down as the assembly nears the edge of the disc.

How fast?

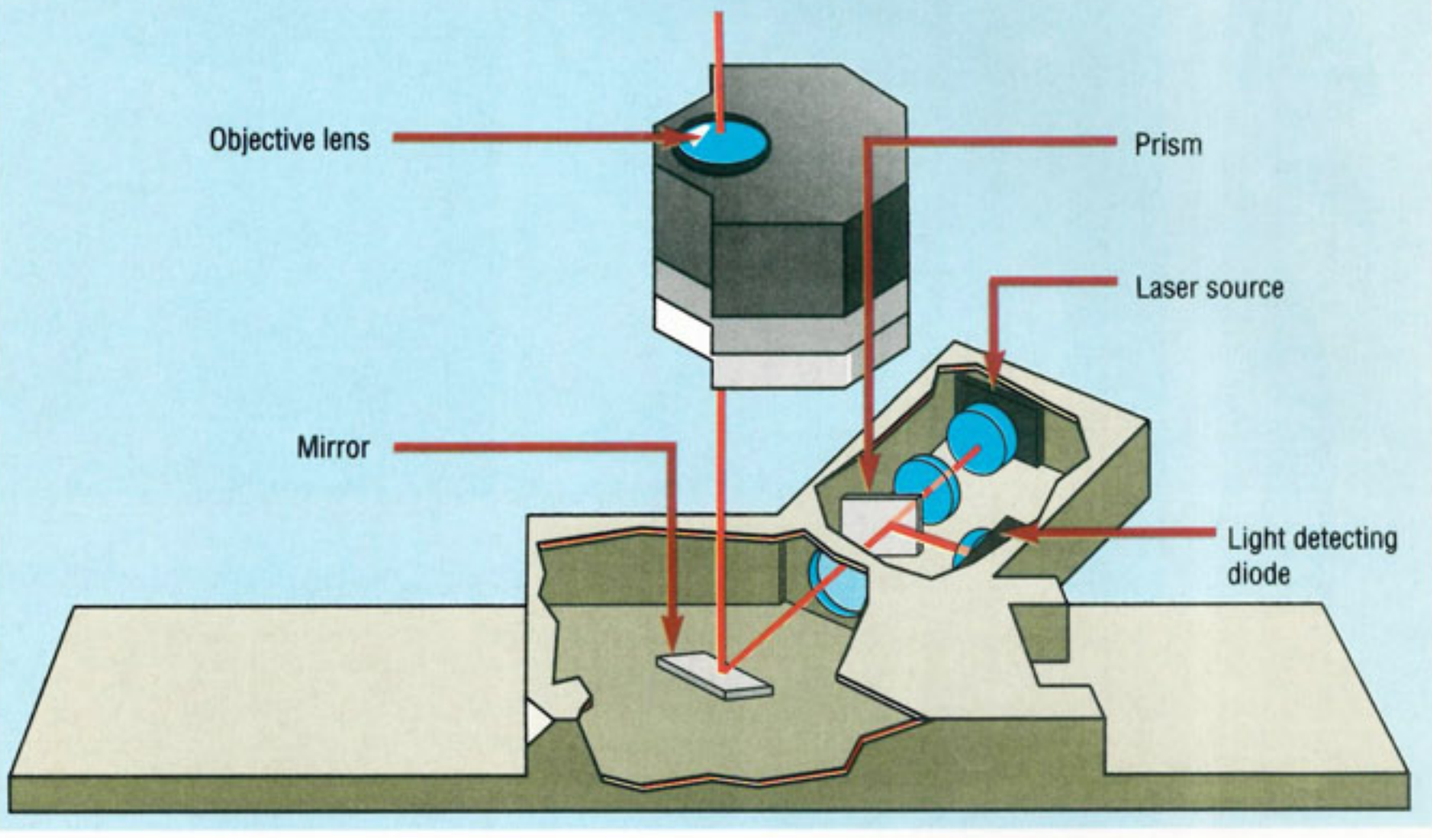
The actual time it takes a CD-ROM drive to adjust the spin speed and find data on a disc is called the 'seek time'. Most modern drives average between a 200 and 400 millisecond seek time. Now, that might sound fairly impressive, but it's still around 25 times slower than a good hard drive.

Another crucial factor in the speed of a CD-ROM drive is the actual spin speed itself. 'Single-speed' drives revolve discs at the same rate as audio CD players, creating a transfer rate of around 150K per second. Again, this is slow compared to a hard disk, and most new CD-ROM drives spin at double speed, giving you a more respectable 300K per second transfer rate. The great majority of these are 'dual-speed' drives; these have the ability to sense an audio CD and play it at the correct speed.

A cache buffer can also greatly increase the performance of your drive. Basically, this is a fast electronic memory which has been built into the CD-ROM drive. The buffer is filled with data read directly from the disc. Then, while the optical head moves off to find and read new data, the buffer continues writing data to the computer before being replenished. Naturally, this reduces waiting time and increases transfer rates.

THE READ HEAD

The read head includes the laser source, lenses and mirrors, and the detecting diode. A servo motor moves the head across the surface of the spinning disc.



Buying considerations

The easiest way to upgrade to CD-ROM is to buy an external drive which simply plugs into your Mac's SCSI port. It only takes a few minutes to install the driver software and then you're away. Bear in mind though, many CD-ROM multimedia titles are fairly demanding on the rest of your system; you need at least 4Mb of memory and a 13-inch colour monitor to run most of 'em.

Don't even think about getting a single-speed drive – they're more or less obsolete. Apple's newer CD 300 is an excellent choice at around £175. Having said that, the Apple single-speed PowerCD is a good buy if you need a portable – especially now that the price has dropped to £165. If you're buying a new drive, it's also a good idea to make sure it's got multi-session capabilities (see the Multi-Session box for further information).

One last point to bear in mind is that CD-ROM software is often expensive. Damn expensive. Many drives have a variety of titles bundled with them, however, so it's a good idea to shop around and find a software package that suits you.

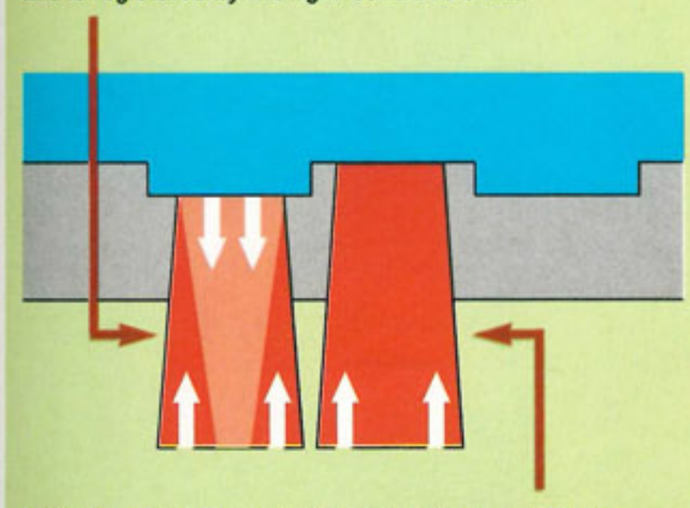
A year ago, it seemed as if CD-ROM had missed the boat; that it was destined to be superseded by something newer, better and faster. The tables have turned now, however. CD-ROM drives are the future – and they can offer you a window to the exciting new world of computing.

Matt Richards

PITS AND LANDS

Data is stored on CD-ROMs in binary code (1s and 0s), just as on floppy disks. But instead of magnetised particles, the 1s are 'lands' and the 0s are 'pits'...

Light reflected in phase passes back through the prism and is registered by the light-sensitive diode.



Light reflected out of phase produces a 'cancellation effect' and no output is sent from the diode.

MULTI-SESSION

Most CD-ROM discs have a metal, foil-based surface covered with a protective plastic layer. In fact, they're identical to audio CDs in their construction. Multi-session discs are distinctive, however: they have a gold surface and are principally used for Kodak PhotoCD images. They're called multi-session discs because you don't have to write all the data to the disc in one go.

The manufacturing process for 'burning' standard metal discs doesn't allow for multi-session use, but gold-plated PhotoCD discs are written using a completely different chemical procedure.

You can store up to 100 35mm transparencies or negatives (or a combination of the two) on a single disc. This means you might typically take your PhotoCD disc back to Boots The Chemist or Kodak half a dozen times to have new batches of photographs added. Hence, the multi-session name.

The image quality of PhotoCD is excellent and while the cost is a little higher than normal reprints, it's very much cheaper than professional colour scanning, which you might want for your graphic or desktop publishing work. The disc itself costs around £5 and image transfer works out at about 60p per impression.

Once they're on a disc, you'll need a multi-session CD-ROM drive in order to view your PhotoCD images. This is because standard drives look for all the header and Table of Contents information at the start of the disc's track. PhotoCD discs, however, have a separate header and Table of Contents at the beginning of each session, and a single-session drive simply can't find or read the information.

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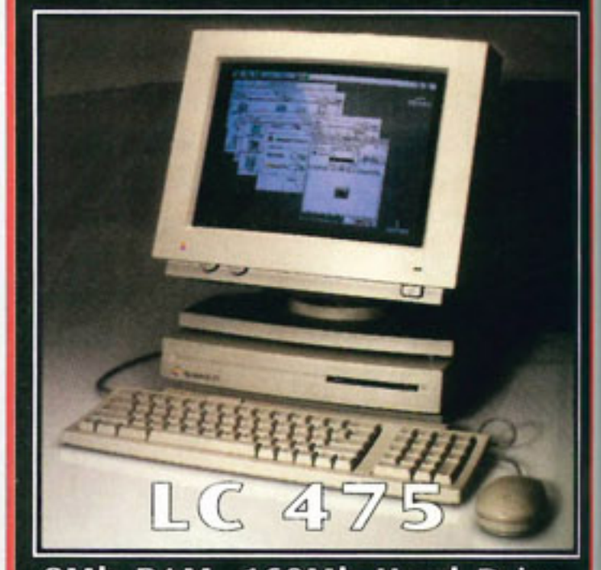

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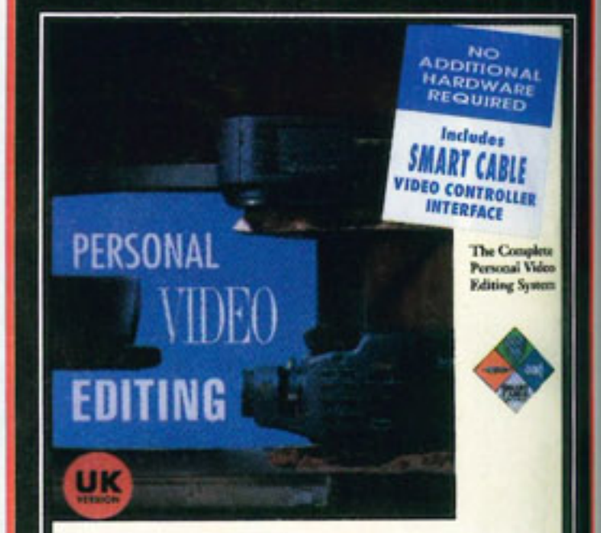

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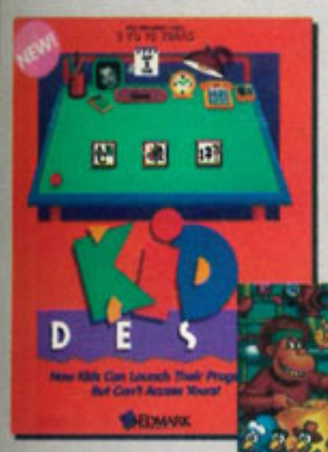

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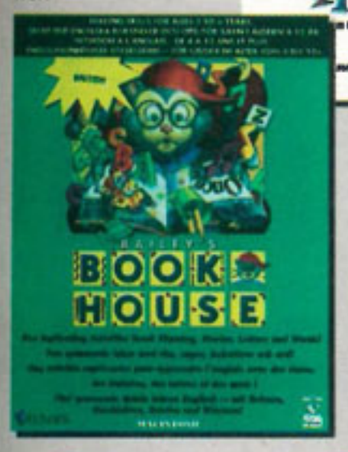

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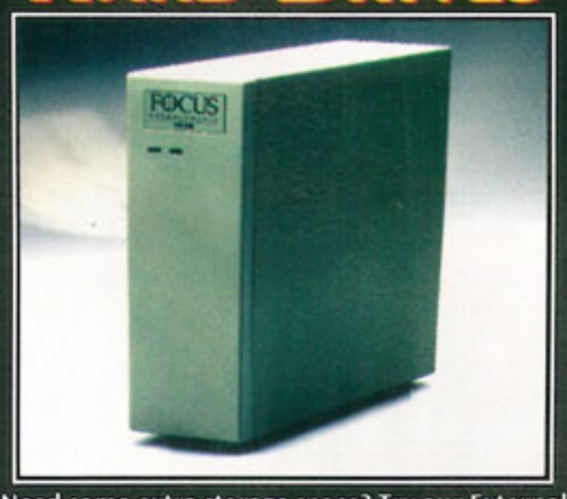

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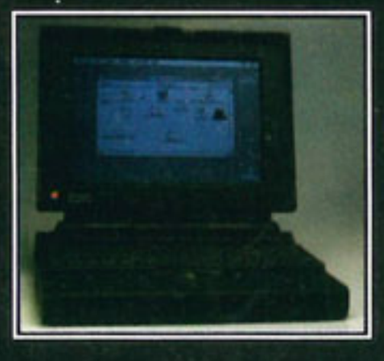

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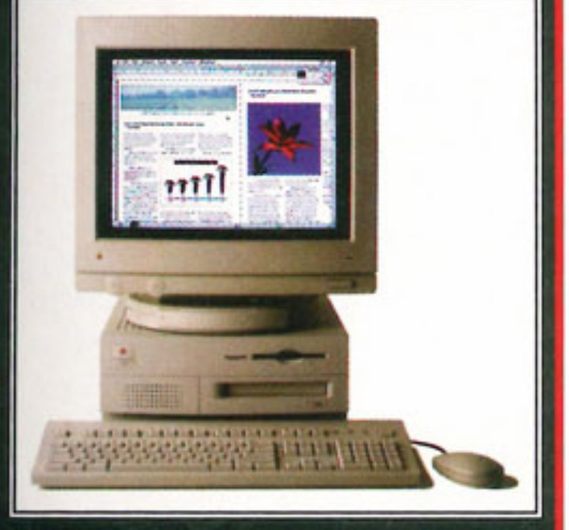

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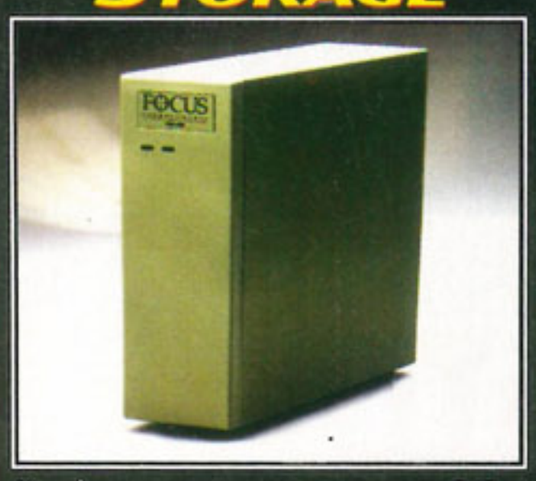

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Just take a quick look in an artist's toolbox and you'll instantly see what all the fuss is about. Each pencil, crayon and lump of charcoal has more versatility when used on its own than the sum of all the tools in the palette of a traditional computer paint program. In the hands of a skilled artist, slight variations of pressure, angle, thickness and density can carry a whole lifetime of feeling; these subtleties are often the difference between a fine picture and a mediocre one. It's hardly a surprise then, that it has taken ten years of Macintosh evolution for all those fine-arty types to stop pulling superior-looking faces at the mere mention of computer art, and instead, turn into real power users.

The Holy Grail

The reason for this transformation is the arrival of cheap Macs which – unlike their predecessors – are powerful enough to run Natural Media paint programs at a pace, which is at least marginally faster than the rate of continental drift. Right from the beginning of DTP, the Mac was the Holy Grail for most graphic designers, enabling them to achieve accurate typography and page-layout on the desktop. Slow and expensive as the early Macs were, anything was faster than the old manual methods, and the increase in productivity soon paid for the hardware. With artists and illustrators, though, things were different.

For many types of visual art, the standard Mac set-up of screen, keyboard and robotic gerbil were just too crude, the painting and drawing tools too flat and 'computerised'. To use computers for their work, artists needed to emulate the soft-edges, blends, bleeds and textures of the familiar natural media. In order to do that, though, they needed an enormous range of colours, high resolution and a more natural drawing instrument – and these all cost big money. Artists and illustrators have always been pretty impoverished creatures; so why pay £4,000 or £5,000 for a computer system when £1,000 buys enough materials to last a year or more? It simply doesn't make sense. And what about the colour output?

As we all know, Macs have now become both affordable *and* powerful enough to provide artists with everything they need to move over to electronic image-making. At the same time, two revolutionary developments have taken place that utilise this considerable power

Charcoal effects can be achieved in normal paint programs with a textured brush and a blend or finger tool. Here the main drawing was roughed out with a plain brush, then blended to provide some gradients where necessary – just like real charcoal and paper.

Although the relief effect of the paint here looks like a real oil painting, it was actually produced in *Painter* using Clone and Relief. This effect is virtually impossible in any non-Natural Media application – but we'll give it a go anyway!

WHAT IS NATURAL MEDIA?

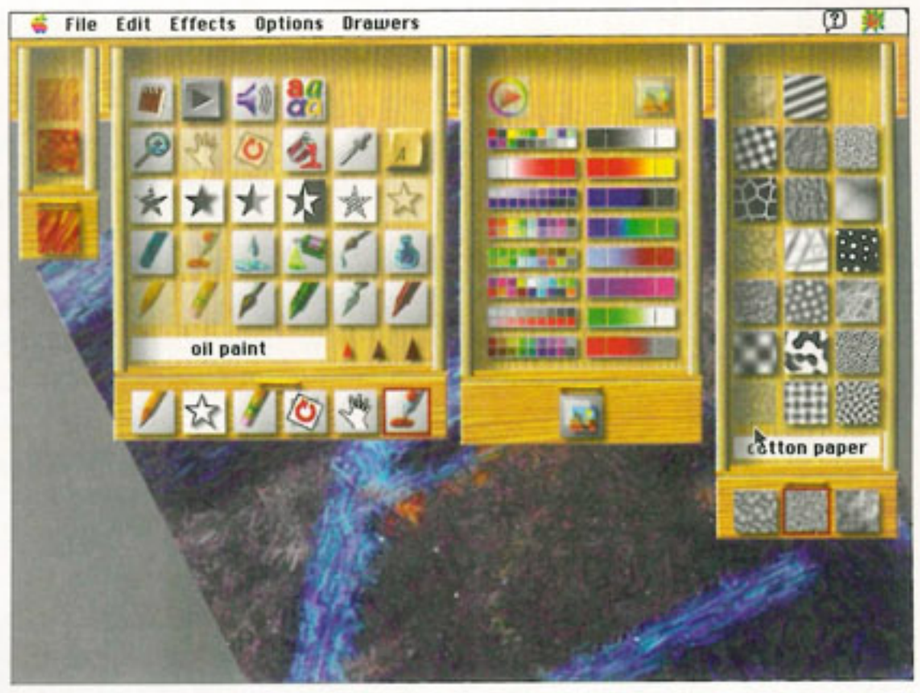
To qualify as a proper Natural Media paint program the software should have most of the following abilities (other paint software should have at least some of these capabilities, if you are planning to use it to simulate painterly effects):

- Enough colours for smooth blends.
- Enough power/speed for smooth brush action.
- Paint and Drawing tools that react like their natural equivalents.
- A selection of pencils, pens, felt pens, erasers, chalk, charcoal, pastels, crayons, watercolour, oil paint, true airbrush.
- Marks that vary in width, density, colour, or opacity (especially with the pressure pen).
- Media that flows, covers, tints, picks up, smudges, washes, crumbles and/or dries out naturally.
- Smudging, smearing, wetting, melting, dabbing, sponging and other effects.
- A selection of textured drawing surfaces, preferably giving variety to the marks that are made on them in real time.
- Multiple masks and friskets that can be selected and re-selected individually and in groups – at will.
- Tracing paper, rub-thru and cloning effects.

A bit of a Dabbler

The 'What Is Natural?' box describes all the criteria for a Natural Media application, but how do you get all of that out of the Mac sitting on a normal mortal's desktop? *Painter*, for example, is unbearably slow on any system below a fast LCIII, and really requires a fast Quadra or PowerMac for smooth operation. One solution is to limit the display to 256 greys. Hence, Fractal Design's *Sketcher* software. Based on its success with this – and three years' experience with *Painter* – Fractal Design has now developed a simpler 16-bit Natural Media application called *Dabbler*. This has most of the functions of *Painter* in a cut-down form, an innovative sketchpad system, page rotation, session recorder, cute interface and sound effects.

The interface is a series of drawer-fronts studded with crisp, smoothly drop-shadowed icons set in a wooden panel. Click on its handle and each one slides down with an audible clunk to reveal more icons for the functions it contains. A wide range of tools including pencils, pens, felt pens, erasers, chalk, crayons, watercolour, oil paint, and true airbrush, are found in the Tools Drawer, along with stencils, fill, fade, blur, wetting effects and a very efficient liquid brush smearing tool. Any six of these can be placed on the drawer front for use with the drawer closed. A colour wheel, plus gradient and colour square palette sets are found in the Color Drawer (the current selection remains on the front). You'll also find dozens of paper textures in the Paper Drawer. None of these have the control or variety of similar tools in *Painter*, but this is probably a blessing as many people would undoubtedly struggle with such a wide range of parameters.

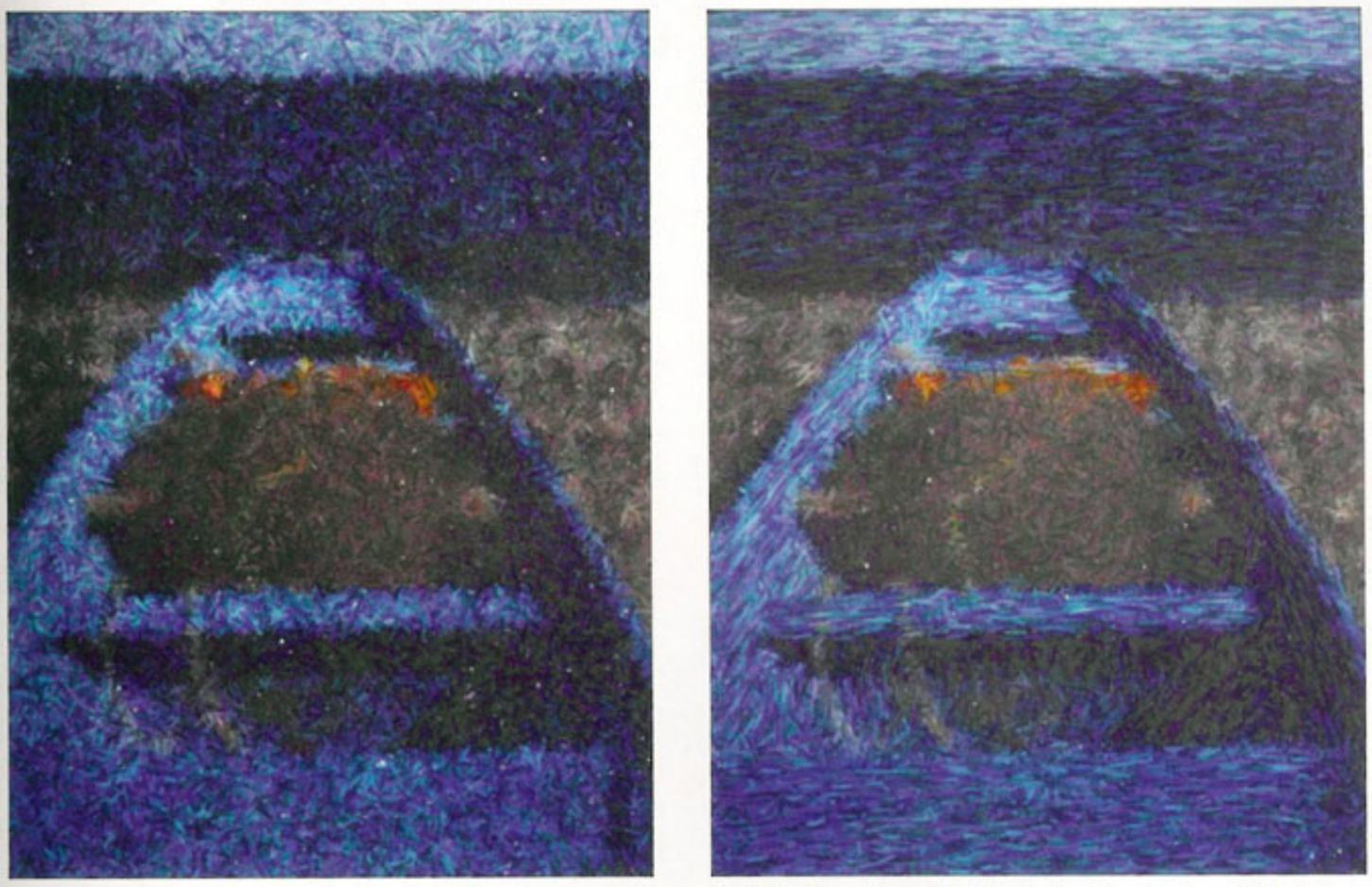


Dabbler's unique drawer/menus show how much effort has gone into making the interface artist-friendly. Notice how the boat image being worked on has been rotated to a more comfortable orientation – just as you would do if you were working with a real drawing pad. This isn't just some gimmick, though; it's actually extremely useful.

Although it's possible to save pictures in RIFF, TIFF and PICT format, *Dabbler* also uses a wonderful 'sketchbook' system of storage, which can be accessed via the Tool Drawer. In effect, the working page is just one of a pad of 12 which can be flicked through in thumbnail form. You can start a new page simply by clicking on a blank thumbnail in the miniature sketchbook in the drawer. Whole projects of sketches can easily be built up and stored in this way – in fact, it's just like using a real sketchbook. Brilliant.

Dabbler has loads more innovative functions (and a couple of minor niggles, too), but if you want to find out what they are, you'll have to read the MACFORMAT review next month.

Win Dabbler
See page 114



You can easily produce an oil-paint effect, like the screenshot on the left, simply by using the Auto-Clone feature (this does all the hard work for you), but the effect is a little too regular. The screenshot on the right is also cloned, but, if you use tracing paper, it's possible to work over the image and ensure that the marks generally reflect and 'model' the shape of the image – much less boring.

to create tools that artists can really use.

The first development comes in the form of cheap pressure-sensitive tablets. Working with a realistic drawing tool, like the Wacom, is an exhilarating sensation; within moments you feel as though you're using real paint, pastels, charcoal and marker pens. The whole thing is truly astounding!

The second development was the arrival, three years ago, of Fractal Design's *Painter* – a remarkable program which transformed what artists could reasonably expect from computer paint programs. Gone were the usual tools of traditional bitmap painting systems: the simple one pixel 'pencil'; the dot-splattering 'airbrush'; the flat-colour, flood-everywhere 'fill'; and the constrained, hard-edge polygons. Instead, *Painter* – and indeed programs which have developed from it – can provide a full range of artist's tools which work almost exactly like the natural materials they're trying to emulate – even to the extent of dirtying felt pens and texturing a wide range of surfaces which you can then paint.

Not everyone has a copy of *Painter* or a Wacom tablet, though, so as far as possible, this series in MACFORMAT over the next few months will describe techniques that can be used with traditional paint programs like *Color-It!*, *Studio 8* and *SuperPaint*. We'll also be covering *Photoshop* plug-ins and effects programs that do most of the job for you, such as *Kai's Power Tools*, *Aldus Gallery Effects* and *Paint Alchemy* – for those times when you need fine results, but have somehow 'mislaid' the skills to achieve them.

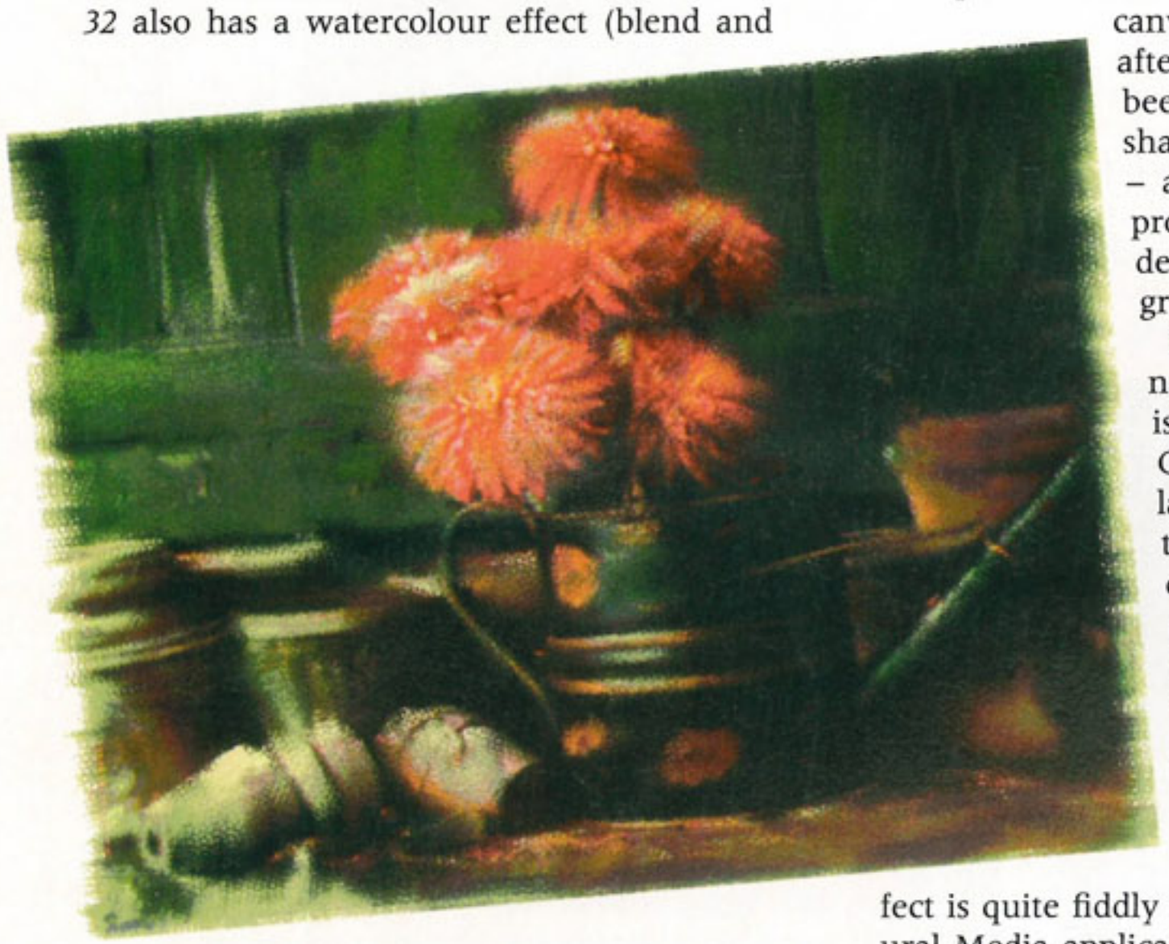
The range of fancy tools, tricks and special effects provided by all of these programs is so vast that it would be impossible to cover it all in a series such as this. We're therefore going to restrict ourselves to techniques that attempt to emulate the basic natural materials: wet media, like watercolour and oils; dry media, like pastels, chalks and charcoal; and airbrushing effects using masks and friskets. Over the next few months we'll describe all of these techniques – how the original natural medium works, which programs do a reasonable job of emulating it, and at least one how-to-do-it tutorial per month. This month, however, we're going to have a broad look at what tools you need to get Natural Media effects – and which programs have them.

Which Mac?

To stand a chance of running any of these art packages, you'll need at least an LC with 256 colours (but an SE/30, LCII or Quadra with 16-bit colour is even better). Such a system should ensure that the colours for blends and smooth

brush action are just about bearable, whatever the software.

The majority of paint programs have some sort of specialist paint tools – even *Studio 8*, which has its own watercolour effect. *SuperPaint 3*, for example, has a rather poor charcoal plug-in, a good airbrush and a reasonable variable-width, pressure-sensitive calligraphy brush. *BrushStrokes* has similar 'extras': an Artist Brush, a reasonable airbrush and an impressionist tool, which is usable but a little crude. *Color-It!*, on the other hand, has no dedicated artist's tools but, like *BrushStrokes*, its brushes can be customised, enabling you to assemble a reasonable set of simulations. *Studio 32* also has a watercolour effect (blend and tint mixed) plus a soft 'artist's' brush and versatile airbrush.



Just to prove what can be done without the aid of a Natural Media program. This image was produced in *Studio 8* using just Brush Blend mode and a small custom brush. A tutorial soon, honest.

Pixel Paint Pro, in contrast, has more dedicated artist's tools than any of the other non-Natural Media programs and, overall, comes closest to providing good support for artists. Its charcoal and pastel brushes both work with a pseudo texture and have variable hardness. The airbrush and soft 'artist's' brush are both effective and easy to vary. Most of the tools react to variations in force, but as with almost every other application that supports pressure-sensitive tablets, the tools only vary opacity, not the density of dots or width of marks. (Rumour has it that a new version of *Pixel Paint*, which is alleged to have much better support for Natural Media, is about to appear.)

Every application mentioned here has some form of blurring or a water tool which can wash colours together to give a less hard-edged quality to the drawing. In addition, most have a blending, smudging or smearing tool which can push the paint around as though it was still wet. *Studio 8* and *Studio 32*, *Pixel Paint*, and *Color-It!* also have colour-mixing or finger-painting modes which enable you to mix and dirty paint 'on the canvas'. Using these tools after simple marks have been applied enables you to shade, blend and 'model' forms – although none of them can produce the realistic effects of a dedicated Natural Media program.

The main area where ordinary paint systems fall down is the surface texture effects. Certain textures can be simulated (even in *Studio 8*) and textured patterns and fills can be applied by most programs as paint – but only *Pixel Paint Pro* has proper textured surfaces which react when normal tools pass over them. Even in *Pixel Paint*, though, the 'Pixel Paper' effect is quite fiddly to use, unlike in Natural Media applications, where textured paper is always readily available.

Nevertheless, there is a way to produce some sort of texturing. All traditional paint packages enable you to set up masks according to either colour, selection or both. If you load a textured image, turn it into a mask and then remove the image, the mask can be used as a textured surface. (We will experiment with this interesting effect in a later tutorial.)

Masks and friskets are also invaluable while painting – especially with an airbrush. All paint programs will enable you to do this sort of masking, but if it's to be of any real use, you need to have several masks which can be selected separately. Unfortunately, none of the applications discussed here will enable you to use multiple masks, although most will save the mask or selection so you can use it again.

By using simple tint and blend effects in a normal paint program, like *SuperPaint* or *Studio 8*, you can make watercolour (the walls) or marker-pen (the roof) type marks.

Overall then, it's patently obvious that normal paint applications are not as well equipped to produce natural painterly effects as dedicated Natural Media programs. Nevertheless, most of the traditional paint programs have enough versatility to adapt their tools and get close. The really big difference is in the way you are forced to work; traditional computer paint systems force you to work the way *they* want, using Natural Media tools is more like using the real thing.

Brian Larkman

Although every paint program provides an airbrush tool, very few of them can be used in the same way as the real thing; selections and masks just aren't versatile enough to simulate an artist's airbrush mask (known as a frisket). To get proper, gentle gradients, as in this example, try using gradient fills.

WHERE TO GET 'EM

- Claris *BrushStrokes 1.0* costs £52.88. For more details contact Claris on 081 756 0101.
- Fractal *Sketcher 1.0* costs £81.08. For more details contact Letraset on 071 928 3411.
- Fractal *Dabbler* costs £88.13. For more details contact Letraset on 071 928 3411.
- Xaos *Paint Alchemy* costs £92.83. For more details contact Principal Distribution on 0706 831831.
- Fractal *Painter X2* costs £116.33. For more details contact Letraset on 071 928 3411.
- MicroFrontier *Color-It! 2.0.1* costs £116.33. For more details contact Softline on 081 401 1234.
- *Kai's Power Tools 2.0* costs £175.08. For more details contact Principal Distribution on 0706 831831.
- Aldus *Gallery Effects* costs £176.25. For more details contact Aldus on 031 220 4747.
- Aldus *SuperPaint 3.5* costs £229.13. For more details contact Aldus on 031 220 4747.
- *Studio 8* costs £233.83. For more details contact Electronic Arts on 0753 549442.
- Fractal *Painter 2.0* costs £381.88. For more details contact Letraset on 071 928 3411.
- *Studio 32* costs £587.50. For more details contact Electronic Arts on 0753 549442.
- Adobe *Photoshop 2.5* costs £851.88. For more details contact Principal Distribution on 0706 831831.
- *Pixel Paint Pro* is now unavailable, but a new version is on its way. For details contact Pixel Resources on 0101 404 449 4947.

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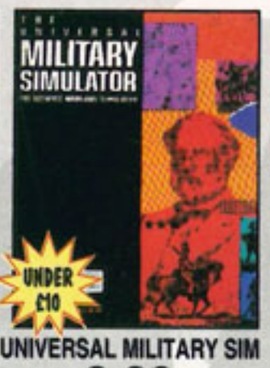

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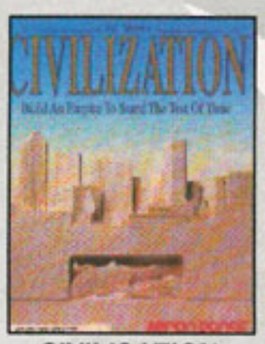

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Across the Spectrum

Traps, choking, knockouts – Martyn Lester guides you through the mysterious and seemingly dangerous world of colour processing...

Our recent feature about using spot colour (MACFORMAT 10) seems to have raised as many questions as it answered: "What the hell do they mean by knockout and overprint?" and "How can the examples shown be anything other than overprint? The black and cyan must be overprinting each other; otherwise the pictures would all be the same colour."

So, before we take another bite at colour effects, it seems sensible this month to hold a revision class on what various types of colour are, and the relationships that can be imposed upon them. Readers who are new to working with colour start here. Old hands are welcome to join us too, if only to throw in barbed comments to the effect that that's not quite how they would have phrased it...

Spot the difference

The simplest and cheapest form of colour printing (unless you're knocking out the odd page on a colour inkjet) is single spot colour; this is where two inks are used instead of one. This is often done in one pass on a two-station printing press, where the paper feeds straight from a plate or roller carrying one ink through to another station which applies the second colour. The job can also be done by passing the paper through two different single-colour presses, or indeed, by passing it through the press once, and then 'wiping down' the press, changing the ink and plates, and passing the paper back through the same press for the second colour to be applied.

Usually (but not always) one of your inks will be black; there's no fixed rule about what other colours you can expect any given high street print shop to stock, although most that can print second colours will have the three process colours – cyan, magenta and yellow. More of those anon.

Small jobbing printers may just offer you the choice of another two or three 'standard' colours, which will often be warm red, bright green and the kind of blue you'd expect to find on Conservative Party leaflets. The most flexible print shops can offer dozens or even hundreds of colours, including fluorescent and metallic inks.

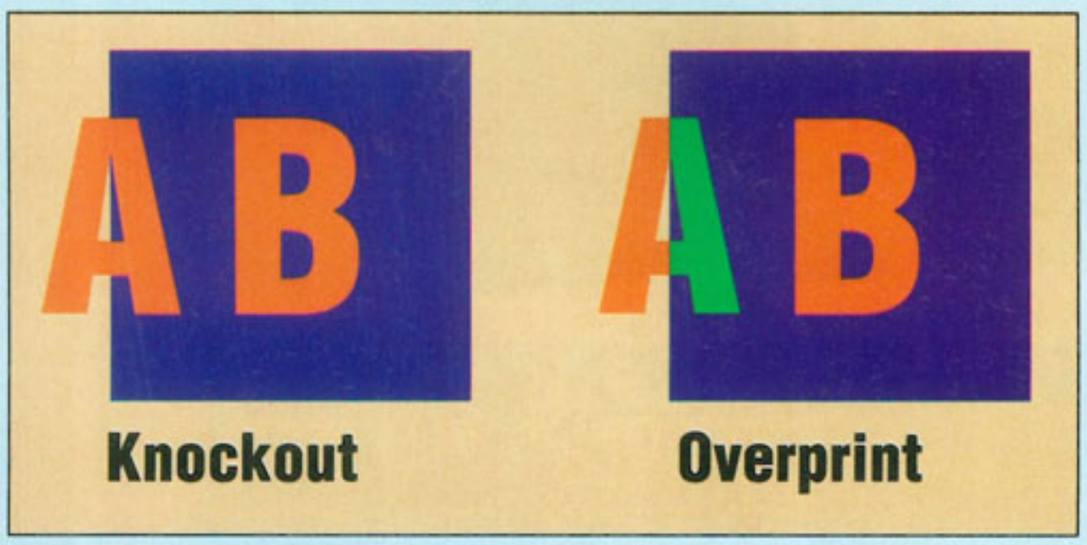
When you're dealing with a printer that only offers the most restricted range of colours, there may be no choice but to look at samples of their work to be sure of what they mean by 'bright green', 'royal blue' and so on. More flexible print shops may work to a generally accepted system of named and numbered colours, the best known of which is the Pantone Matching System. Books of samples define all of the Pantone colours, so if you order a given colour and the printer agrees to supply it, you can be reasonably sure of what you're getting.

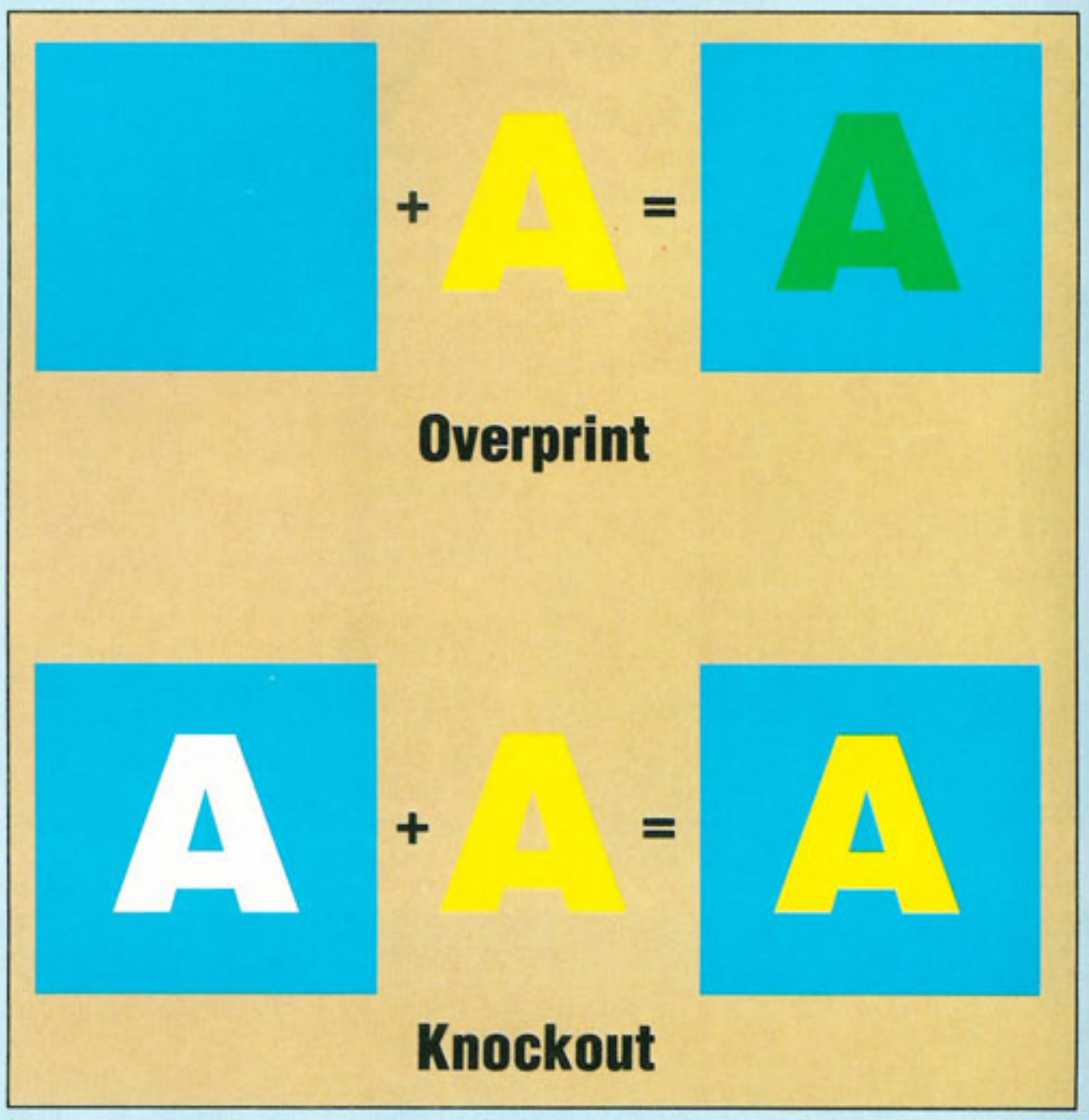
Many people think that Pantones are different from spot colours, as in, 'Are we going to use a spot or a Pantone here?' But generally speaking, a Pantone is a spot colour (I'll look at

KNOCKOUT AND OVERPRINT

It's very important to understand when you want two colours to print on top of each other (overprint), and when you want the presence of one colour to automatically remove the background (knockout).

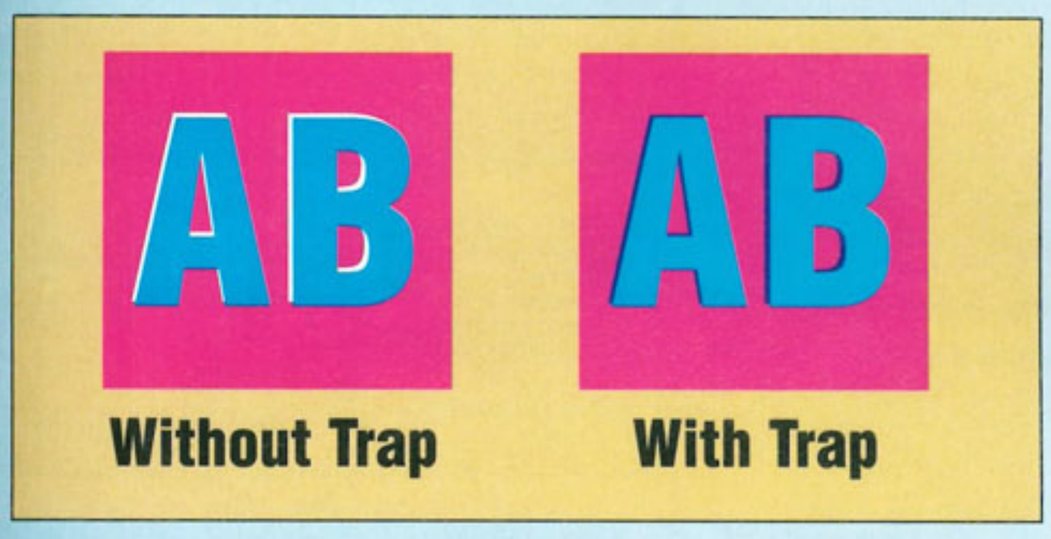
The vast majority of the time you will want the colours to knock each other out – that is where both colours are printed directly on to the white of the paper, but there are occasions when this won't give you the effect you want. For instance, if you are creating artwork which will be printed on a transparent plastic bag, you might want the white ink to print solidly behind whatever other colours you use. Or if you think there may be registration problems and some white paper may appear, you can use overprint to guarantee that all the paper is covered with ink. If you do use overprint, you need to ensure that the overprinting of the two colours doesn't create a new colour which you don't want – it's usually safe enough with black, but don't try it with yellow.

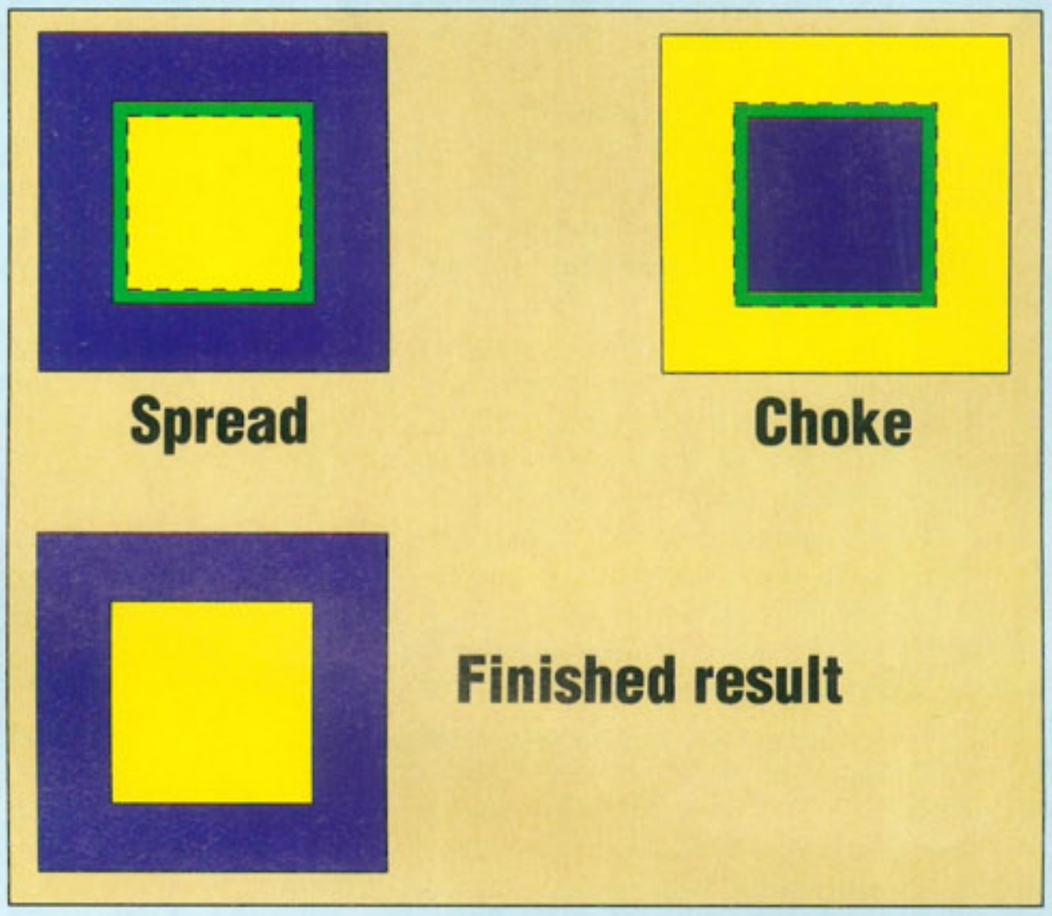




DON'T GET TRAPPED BY COLOUR

When you print two colours and one knocks out the other (see opposite) there's a danger that misregistration during the printing (that is, when one colour plate isn't properly aligned with another) will leave sections of the paper unprinted, causing small white gaps between the colours. To avoid this, DTP programs like *XPress* use a technique called trapping, which slightly expands one colour over the other, so there will be no gap. How it does this depends on the colours involved – it will always expand the lighter colour over the darker colour, because this is less visible. Spreading is when an object is enlarged through trapping; if the background encroaches on the object it is said to be choking.



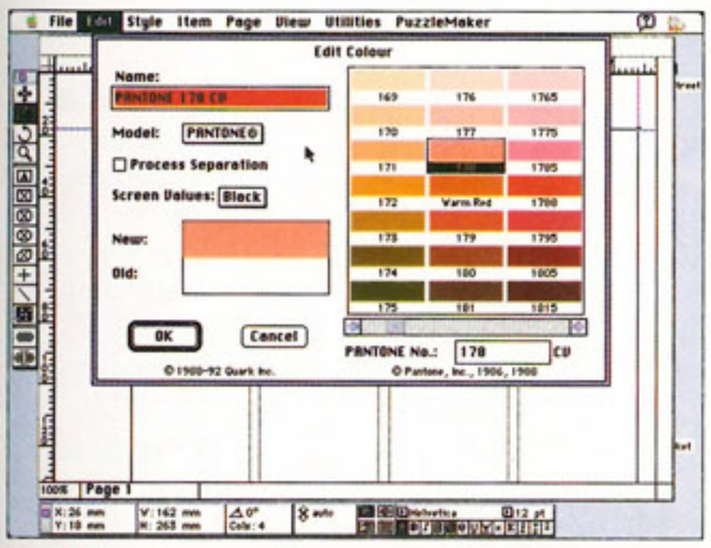


the exception in a moment), just a carefully defined one.

Depending on the print shop and the equipment it uses, you may not be restricted to a single spot colour in your documents – and some people use two, three or more spot colours on a page. However, unless you need very specific colours – fluorescent and metallic inks are the obvious examples, but they're not the only ones – it may be uneconomical to go beyond four colours (including black) when you could use process printing instead.

Process printing

Process printing is a technique which uses black plus the three primary colours – cyan, magenta and yellow. These colours can be mixed on the page to produce an enormous range of secondary colours. Strictly speaking, there are only three true secondary colours – red, blue and green – but by applying very small dots of primary colours in close proximity to each other, you can create the illusion of thousands of different tones; this constructs an image in roughly the same way as a TV's glowing red, green and blue dots.



Most DTP programs enable you to use the Pantone system for specifying colours, either for spot or process work.

Although it is not strictly correct to say that four-colour process printing is the only way that colour photographs can be reproduced on the page, it's the only way that most of us ever use or come across.

Process printing needs to be performed on a four-station press, or by passing the sheets through a single-colour press four times (once for each colour). It also requires four inks, four sets of printing plates, and, therefore, four times as much setting up and wiping down as black-only printing. Because of this, if you only need one extra colour (such as warm red), then process printing is rarely an economical way of getting the desired result. It's generally much cheaper to use a warm red ink, which only requires a two-station press, or two passes on a single-colour press.

If you want six colours, on the other hand, it is usually cheaper to create them from process colours, provided the software you are using for your DTP supports this. If you can't find 'process printing' as an entry in your software manual, it doesn't necessarily mean that there's no support – it's possible that you'll find the details listed under 'four-colour printing', 'separations' or 'CMYK'.

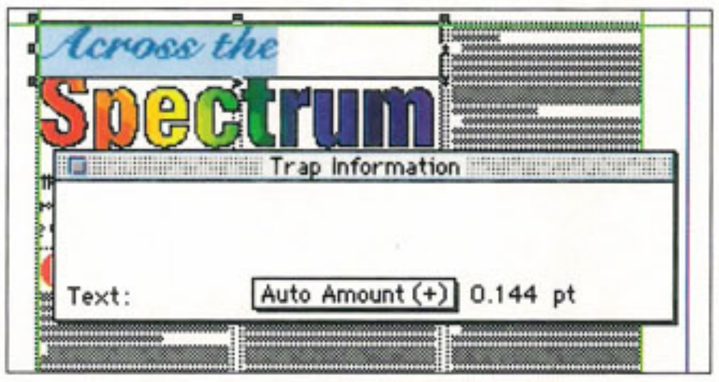
As well as handling process separations, some DTP software now also supports proprietary matching systems – again, the most common one is Pantone – either directly or via add-on utilities.

The first thing that such utilities do is to calculate RGB (screen colour) equivalents for the matching system's colours. So, if you are intending to specify Pantone inks, for example, Pantone support will enable you to see on-screen an approximation of what the finished document will look like. How good an approximation this is will depend on the type of monitor you are using and the standard of your video output.

Pantone support also incorporates CMYK values for each colour, as specified by Pantone Inc. So, if you want elements of your documents to match Pantone colours but you're using process rather than spot printing, your software can apply the recommended proportions of cyan, magenta, yellow and black to achieve a close match, rather than you struggling to work out what the correct values might be by yourself.

If you don't have Pantone support in your software, this doesn't mean that you can't use Pantone inks. Provided that you can output spot colour separations from your software, you can agree with your printer to have the spot separations run in any colour that the print shop is capable of supplying – including Pantone colours or those of any other colour matching system.

There is one final 'colour' that doesn't fit into the above categories, and that is 'registration'. Registration isn't really a colour at all, in the normal sense, but rather a specification that can be applied to any item that you want to appear on all of your separations. In other words, the 'colour' that has been specified as registration is used to indicate any item which you want to be printed in all the ink colours that you are using. As the name suggests, its primary use is for specifying registration marks (usually cross-hair style icons on the edge of a page), which the printer uses to ensure the plates are in register (line up), so that the various colours print in the right place in relation



XPress enables you to control the amount of the overlap when trapping occurs – here it is a tiny fraction of a point.

EVEN MORE COLOUR KNOW-HOW

■ If you are going to print using spot colour, and if you have a colour display and your software enables you to define custom colours, then make up a custom colour which looks approximately the same on screen as the colour ink that you want to use. This way you'll get a reasonable impression from your monitor of how the finished document will look.

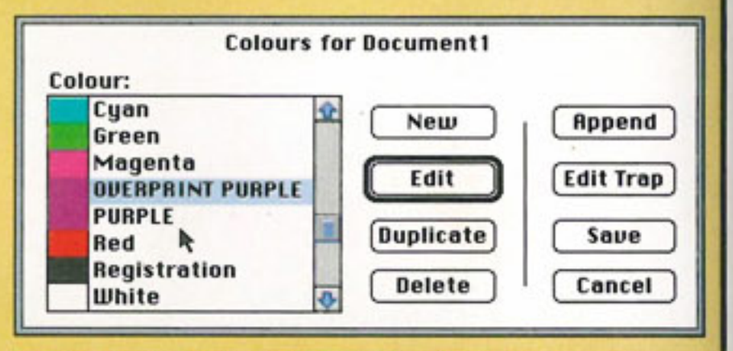
■ If you will be using inks from a proprietary matching system (such as Pantone) and your software supports that system, then choose a colour directly from the matching system's palette and add it to your document's defined colours palette – it will save you defining the colour in another model, such as CMYK, RGB or whatever.

■ If you're using a spot colour (whether it's from a matching system or one that you've defined in another colour model), make sure that its specifications have process separation turned off, otherwise when you ask your Mac to separate for spot, it will separate the colour into a CMYK equivalent and print out four plates instead of two.

■ And the converse is also true. If you're using process printing, make sure that process separation is specified in any custom colours that you create. If you don't, when the Mac is asked to separate the colours, it will print separations for cyan, magenta, yellow and black *plus* your custom colour, which the software will assume you intend to use as a fifth spot colour.

■ If you want an identical object (such as registration marks) to print on all plates, but your software doesn't have registration as a preset colour, make up a colour which is 100% of all of the plates that you are going to use. For example, if you are working with black and yellow, define a colour that is 100% black and 100% yellow, and use this as registration.

■ On the face of it, it's impossible to have two colours in a process colour document which are sometimes overprint related and sometimes knockout related, because you can only define one relationship between them for that document. However, with a spot of lateral thinking, you can achieve exactly this effect by having duplicates of the colours. As a simple example, if you want purple to knock out yellow in some places, but overprint in others, define a new colour with exactly the same specifications as your original purple, but call it 'overprint purple' or something similar. Then, define the relationship between this 'new' purple and yellow as overprint. Now when you want to overprint, use this version of the purple – it will look exactly like the other purple, but technically it will be a different colour, and will have the altered overprinting values. Be sure to remember which is which!



In order to vary the overprinting relationship of a colour, create a duplicate with a different name and use that.

to one another.

It's a knockout

When two of the colours that you have defined for your document overlap, there are two possible relationships between them – overprint and knockout. With overprint, both colours are printed, creating a third, darker colour in the overlapping area. When knockout is specified, on the other hand, the foreground colour will 'knock out' the background colour in the overlapping area, so that only the foreground colour prints.

If, for example, you want a yellow headline on a blue background, a knockout relationship prints the blue background with a white headline reversed out of it, and then prints the yellow headline over the white spaces. If the relationship were overprint, however, the yellow headline would print over the blue background, and so would appear green.

Most software is set up so that where any two objects overlap, the one that is specified as being in front will, by default, knock out the overlapping area of the one behind it, regardless of their colours. (The layer relationship will usually have been defined via commands such as **Send to back**, **Bring forward** and so on.) The default is usually the same when two colours are used within one object; so, for example, when text contained in a box is one colour while the background is another, or when a graphic is sitting in a box with a coloured background, the foreground colour will still knock out the background.

An exception to this is that black sometimes defaults (or has been specified by someone who has set up your package) to overprint, on the grounds that it will be darker than anything it is on top of and will, therefore, swamp the background. This is generally OK, but watch out for black objects overprinting patterned backgrounds – black ink is not 100% opaque, and a ghost of the pattern will show through.

If you find that black has been user-specified to always overprint, beware of changing it to permanent knockout relationships. Last year I came across a man who had set up a design style to have warm red page headers with a black drop shadow, but every time his bureau tried to output a document, the headers came out black with a warm red top shadow. They had a week's worth of nightmares, before it came to light that the user had inadvertently set black to always knock out warm red.

By and large, it's always best to leave your software's default relationship settings alone unless you are trying to achieve a particular effect and they are preventing you from doing so.

Oh no! It's a trap...

The other way in which colours relate is via trapping settings. 'Trapping' is the term used to describe a slight overlap of colours, which the software creates as a safeguard against small misregistration problems on the printing press. If you have, say, a yellow square on a blue background and the colours meet exactly but the press is slightly out of register, then the colours will overlap at one or two of the square's edges causing a white line on the opposite side(s) where the colours don't quite meet. Trapping means that there is enough of an overlap built in to avoid these white lines.

I recently read the comment, "Traps are called spreads or chokes, depending on who you are talking to," which is nonsense. In fact, spreads and chokes are two different types of colour trap. A spread is where the foreground object is slightly enlarged to overlap the edges of the background colour, while a choke is where the background colour encroaches into the boundaries of the foreground object.

The main reason for these two types of colour trap is that it is normal for the paler of the two colours to do the overlapping, so that the overlap is as near invisible as possible. So, if you had a yellow headline on a black background, you would want the letters to spread – if the black choked, the effect would be of reducing the weight of the type. On the other hand, for a black headline on a yellow background you would want the yellow to choke, because spreading the black would effectively increase the weight of the type.

Again, the default settings of your software are best left well alone – as long as nothing is going wrong, that is. The only reason that you would ever want to change the settings is if you find that you are printing on a press which has a tendency to be further out of register than your software allows for. If this is the case, you will need to increase one or more of the trapping values – check your manuals to find out how this is done with your particular type of software.

Martyn Lester

JARGON BUSTERS

CMYK: Cyan, Magenta, Yellow, Black (or 'Key') – the four colours used in process printing; all the colours you see on a printed page (like this one) are made up of these colours in various proportions. Warm red, for example, is 100% magenta *plus* 100% yellow.

RGB: Red, Green, Blue – the colour system used to display colours on-screen. The problem is that this is based on a completely different system from the CMYK process which is used for printed colours. That's why it's so difficult to predict what the colours you specify on-screen are actually going to look like.

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Exploring HyperCard

HyperTalk has variables, sub-routines and loops like any language. Here's how they work...

HyperCard variables are like variables in any other programming language. They are transient containers for either text or numbers being manipulated within your routine. They're transient because when the routine finishes and is exited, they are lost.

Well, maybe they are. *HyperCard* variables can be defined as 'global', which means they can be shared by many separate routines. Text and numbers can also be stored in *HyperCard* fields – which are permanent containers. How many programming languages can boast those?

But we'll come to global variables and fields in a minute. First, though, a bit more about HyperTalk variables.

HyperTalk variables are 'typeless'. This means that the same variable can store integers, floating point numbers and text strings. So you don't need to define the variable type at any stage.

And HyperTalk variables don't need to be 'declared'. Some programming languages require you to name all the variables the routine is going to use right at the start (you must name their type, too). In HyperTalk, however, you can simply invent variables as and when you need them.

The only real restriction applies to variable names. You can't use any spaces in the name whatsoever, or any punctuation for that matter. You can use capital letters, if you wish, but there's not much point in doing so, because HyperTalk doesn't differentiate between upper and lower case.

Global variables are common to most programming languages. In HyperTalk they let you define a variable that will be used by more than one handler. You define a global variable by including the following line right at the start of the handler:

```
global [variable name]
```

Any handler that uses this global variable must have this line.

Using fields as variables is more interesting still. The values and strings you store in fields are 'permanent'. That is, they are retained after the handler has finished – even after you quit out of *HyperCard*.

You can also use them as an alternative to variables. Take this for example:

```
put field "unit cost" * field "number ¬
sold" into field "total cost"
```

This works just the same as putting the contents of these fields into variables and carrying out the same calculation, before putting the result back into a field. *HyperCard* manipulates variables faster than it manipulates fields, but that's the only difference.

Sub-routines

It's possible to write all your programs as single lumps of code. Possible, but not advisable; it's much easier to understand (and de-bug) your programs if you break them up into bite-sized chunks.

For example, instead of one long program that asked you to input a list, sort the list alphabetically, then print it out, it would be much easier to write three programs. The first would prompt you for your input and then store it. The second would sort this stored input. The third would print the sorted material. You can write and debug each part separately – so, our program would now look something like this:

```
on mouseUp
  get input
  sort input
  print
end mouseUp
```

The three lines between the mouseUp handlers are 'pseudo-code'. That is, they're not legitimate HyperTalk code, but just a skeleton representation of what you would write.

Each of these lines would start a sub-routine, and each sub-routine would, in turn, carry out a small part of the main job. Once each sub-routine has finished, control passes back to our main program above, and the next sub-routine is started.

It's much easier to trap a bug in a small seg-

READER FEEDBACK: A NEW SCRIPT AND HYPERLUNACY

Programmer's Gem

Owen Kelly from London has written in with this truly excellent little handler to go in your Home Stack's script. So, without further ado, here it is:

```
on returnKey
  global memoryBox
  if the optionKey is down
  then put memoryBox into msg
  else
  put msg into memoryBox
  pass returnKey
  end if
end returnKey
```

"I wrote this handler because I was being driven mad in the middle of the night trying to check what was going on with some globals. I began to suspect I was making spelling mistakes (typing OldNumbet instead of OldNumber, that kind of thing) and that the variables themselves were actually working correctly.

"The memoryBox handler enables you to recall a question you typed into the message box, if the answer is not what you expect. This means you can check that you asked the right question in the first place (that is, with no typing mistakes).

"Open the message box and then type, for example, 9*9. Hit [return] and up comes the answer, 81. Now hold down the [option] key and hit [return], and back comes 9*9.

"So if the variable had been written as OldNumbet, and the answer is not what you expected, [option] [return] brings back your original statement, enabling you to change OldNumbet back to OldNumber and try again.

"In my case, of course, the variables weren't wórking – unfortunately, the spell ing mistakes I'd made were merely the icing on the cake. Still, at least I got a useful script out of it..."

Thanks for that handler, Owen, it really is an excellent one. Extremely original, and very useful indeed when your handlers aren't working and you need to resort to typing individual commands into the message box. Which, let's face it, for most HyperCard *programmers, is pretty much all the time. Ah well, such is life!*

ment of a program than in one long stream of code, particularly since you can get each sub-routine working independently and, once it's working, you know you don't have to worry about it any more.

The way you set up sub-routines in HyperTalk is simplicity itself – you simply 'invent' your own HyperTalk 'message'.

By now you'll know how to intercept messages with message handlers. (If not, see MACFORMAT issue 11.) Well, it's the same process with HyperTalk sub-routines. This time, though, you've sent a message of your own. An example will make this easier to follow:

```
on mouseUp
  beepflash
end mouseUp

on beepflash
  beep
  flash
end beepflash
```

The two handlers above go in the same script. The first one contains a single line with a single word – 'beepflash'. This is a word we've simply made up. When HyperTalk encounters it, it doesn't recognise the word, but it sees that the word is on a separate line, and therefore knows it has to start looking for a sub-routine with that name, starting with the current script.

Our home-made message follows the same path through the system as HyperTalk messages, so our sub-routine doesn't actually need to be in the same script. Provided it's in a script somewhere further up the message hierarchy, HyperTalk will find it.

This is very useful if you develop a complex handler that you need to use frequently. To save storing it in the script of every object that uses it, give it a name of its own, store it in the stack script or background script and simply 'call' it every time you need it.

For example:

```
on complexthing
  do these complicated things
end complexthing
```

This is a handler that goes in the stack script. And each button that needs to carry out this special routine simply needs to incorporate the following script:

```
on mouseUp
  complexthing
end mouseUp
```

The extra time it takes HyperTalk to find the 'complexthing' handler is minute compared to the reduced complexity and size of your stack.

Just as importantly, though, if you want to make any changes to your 'complexthing' routine – you might find a bug, or a much better way of doing it, for example – you only have to change it once!

Loops

Loops are an indispensable way of handling lines in fields, cards in stacks, characters in fields and more. Loops carry on doing something until a certain condition is met. For example, you might want to collate the name of every card in a stack. You'd do it like this:

```
on mouseUp
  repeat with i = 1 to the number of ¬
cards
  put the name of card i into line i ¬
of namelist
  end repeat
  put namelist into field "card names"
end mouseUp
```

Loops are created with this 'repeat... end repeat' structure. But you need to qualify the number of 'repeats' to be carried out, otherwise the loop will go on forever. In the above example, we got HyperTalk to find out how many cards there were in the stack first, then repeated the loop that many times.

We could have done it differently. We could have written the handler like this:

```
on mouseUp
  put empty into namelist
  repeat 100 times
  put the name of this card & ¬
return after namelist
  doMenu next
  end repeat
  put namelist into field "card names"
end mouseUp
```

You'll notice how this routine has had to be substantially rewritten to cope with the different 'repeat...' structure. Even now, it doesn't do quite the same thing. It repeats 100 times, no matter how many cards there are in the stack, and it has to 'visit' each card in turn, rather than simply referring to them remotely.

This just serves to illustrate the fact that of the various 'repeat...' structures you can use, each works differently, and (generally) only one will work just the way you want.

Here are two more 'repeat...' structures,

WHERE CAN YOU STORE TEXT AND VALUES?

Normal variables	EXIST ONLY WITHIN HANDLERS
Global variables	EXIST UNTIL YOU QUIT HYPERCARD
Fields	PERMANENT

HyperTalk supports the two types of variable you'd find in any other programming language – 'local' and 'global' variables. But you can also store values in *HyperCard* fields – and manipulate them just like variables. Fields are a little slower to use, but they are permanent, and readily available.

Just one example of how combining a programming language and a database produces something much more powerful than the sum of its parts!

HyperCard fanzine

Steven Checkley from Droitwich is putting together a *HyperCard* fanzine. Not just a fanzine about *HyperCard*, but distributed as a *HyperCard* stack.

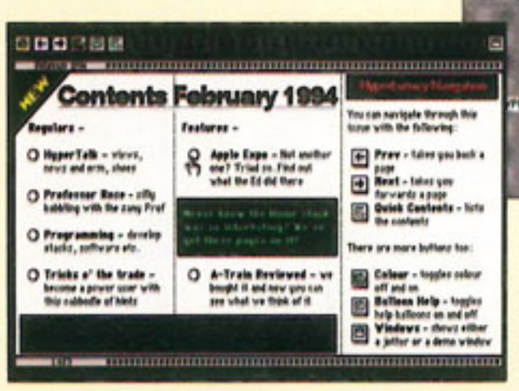
"For some years I have been toying with the idea of writing a fanzine. After two failed attempts (which to be honest were not my fault), I've plumped for working on a *HyperCard* fanzine. It's called *HyperLunacy* and the first issue is nearly ready. If anyone wants to contribute, I'm willing to pay them.

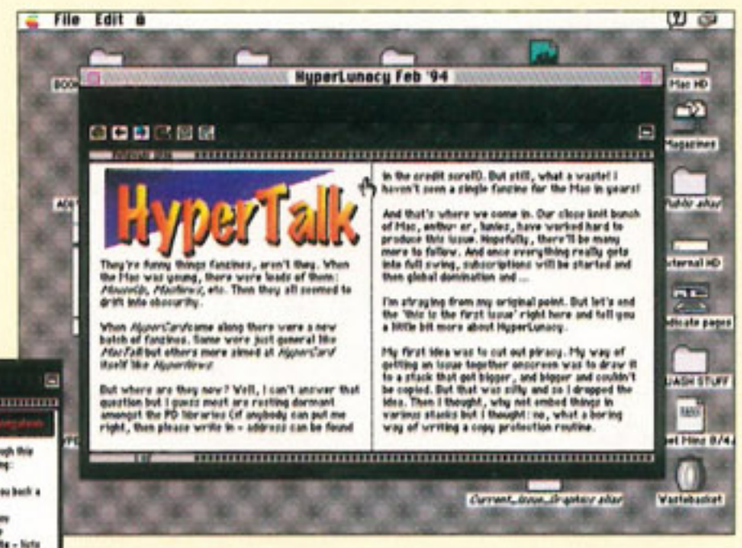
The issues cost £2 each, which covers an 800K disk and p&p. If you send an SAE and 800K disk (it must be 800K – I've only got 800K drives), it'll only cost 50p. Keep up the good, nay, excellent work."

Well, I've taken a long look at Steven Checkley's fanzine, and there's some pretty impressive stuff in there. The writing is good, the design is (mostly) good and the contents look as if they're going to be very informative.

Just as interesting, though, is Steven's HyperTalk know-how – colour support, text scrolling and pop-up menus are all pretty impressive stuff, and it all just goes to show what HyperTalk can do.

If you think you could write for HyperLunacy, *or you want to see a copy, write to: Steven Checkley, 4 Charlecot Road, Droitwich, Worcs WR9 7RP.*





Can't get enough of *HyperCard*? Well, why not get in touch with Steven Checkley and grab yourself a copy of his *HyperLunacy* fanzine. Not only is it all about *HyperCard*, it even comes in the form of a *HyperCard* stack.

starting with 'repeat while...'. Our handler could read something like this:

```
on mouseUp
  put 1 into i
  repeat while i<100
  put the name of card i into line i ¬
of namelist
  add 1 to i
  end repeat
  put namelist into field "card names"
end mouseUp
```

This one will fail if there are fewer than 100 cards within the stack; it will say 'there is no such card.'

Corresponding to this 'repeat while...' structure is the 'repeat until' structure. The above handler could be rewritten:

```
on mouseUp
  put 0 into i
  repeat until i=100
  put the name of card i into line i ¬
of namelist
  add 1 to i
  end repeat
  put namelist into field "card names"
end mouseUp
```

Decision-making

Closely allied with loops is the concept of decision-making. HyperTalk uses the usual 'if... then... else...' structure. The best way to demonstrate this is to show you an example.

```
on mouseUp
  get the clickText
  if there is a card it
  then
  go card it
  else
  domenu New Card
  set the name of this card to it
  end if
end mouseUp
```

This is the commonest form of the 'if... else...' structure. It causes one of two things to happen, depending on what it finds. This useful handler checks to see if there is a card with the same name as the word you've just clicked on. If there is a card, it will go to it. If there isn't, it creates one – an ideal handler for hypertext applications (basically, hypertext provides links between words or phrases and explanations or related material). This handler needs to be in the script of a locked field. You may, want there to be a whole list of possibilities, though, in which case you need to use 'else if'. This handler simply beeps according to the reply you choose from the list available:

```
on mouseUp
  answer "How many times do you want ¬
your Mac to beep" with "1", "2", "3" ¬
or "4"
  if it is "1"
  then
  beep
  else if it is "2"
  then
  repeat 2 times
  beep
  end repeat
  else if it is "3"
  then
  repeat 3 times
  beep
  end repeat
  else
  repeat 4 times
  beep
  end repeat
  end if
end mouseUp
```

Note that 'repeat...' structures can be nested inside 'if...' structures and vice versa. You can also nest 'repeat' structures within other 'repeats', and 'ifs' within other 'ifs'. Watch out, though, because nested structures can get mighty confusing – and there's usually a simpler way of doing the same thing.

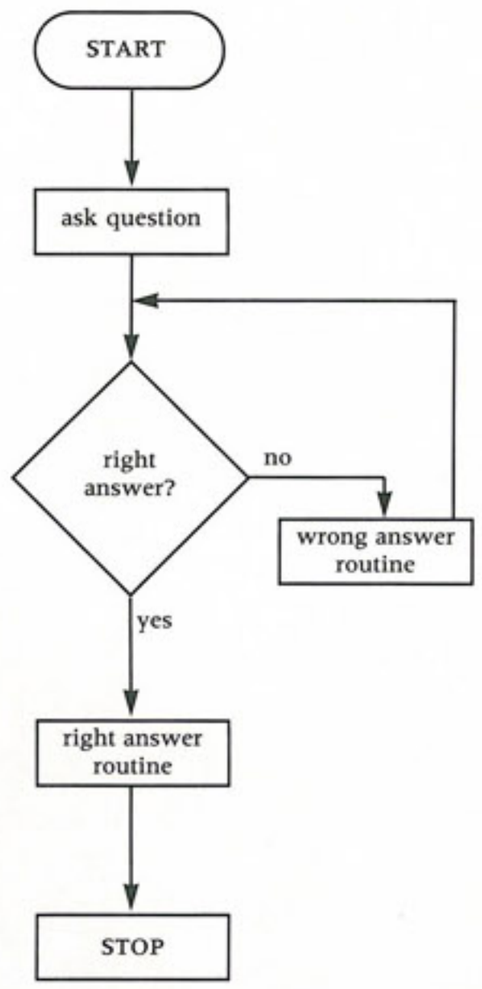
Talking of which, as a parting shot, take another look at the final handler shown above – the one that controls how many times your Mac beeps, depending on your input. It currently stands at 14 lines, but it's possible to get it down to four, with just one 'repeat' and no 'ifs'. Think you know how to do it? Smug replies on a postcard, please, to the usual MACFORMAT address.

Rod Lawton

NEXT MONTH

That's enough theory, now for some fun! Next month we'll be using HyperTalk and *HyperCard* to build an great little utility for anyone who uses the telephone...

DECISION-MAKING



All programming languages allow decision-making; here's a flow diagram showing how our 'question-asking' pseudo-program works. (See sub-routines panel)

Sub-Routines

There are two ways to write programs. One way is to write one single, linear block of code. And then there's the right way – to combine smaller, self-contained, 'modular' blocks of code. (The following two comparisons are written in 'pseudo-code'. It doesn't work, but it does indicate the framework of the program.)

See the difference? The modular example is instantly much easier to follow. It's not as compact, but it's now much easier to see why each line is there, and how it all fits together. What's more, now that you've separated these 'right answer' and 'wrong answer' routines you can use them again and again – different programs can 'call' them instead of having to incorporate the full code.

Linear Code

```
start
  ask a question
  right answer?
  flash
  play a tune
  say "well done"
  new question
  wrong answer?
  sound a buzzer
  say "try again"
  repeat question
stop
```

Modular Code

```
start
  ask a question
  right answer?
  rightanswerroutine
  wrong answer?
  wronganswerroutine
stop

rightanswerroutine
  flash
  play a tune
  say "well done"
  new question
end

wronganswerroutine
  sound a buzzer
  say "try again"
  repeat question
end
```

GET IN TOUCH!

If you have a handy handler you want to share with the rest of us, or a tricky *HyperCard*/HyperTalk problem you can't get round, write to us at the following address:

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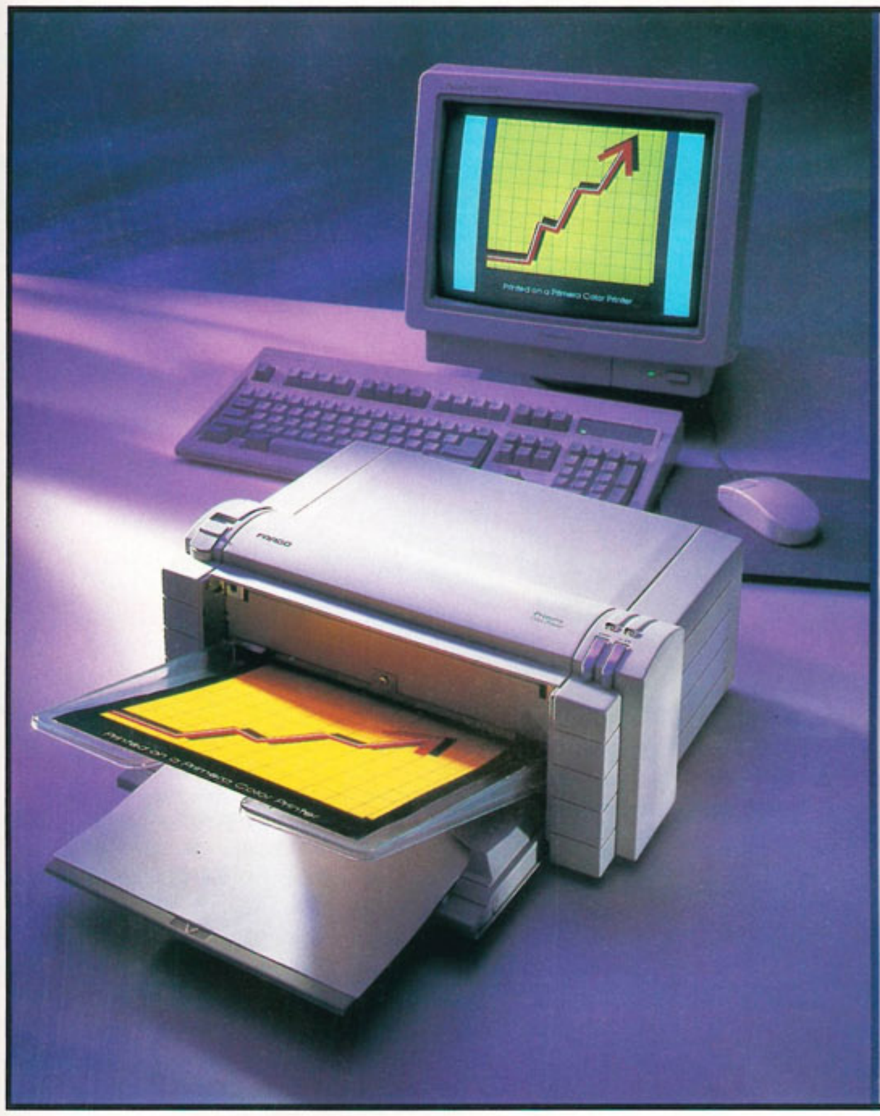

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Upgrade your RAM

The thing about RAM is that you never have enough. It's easy to fit more memory to your Mac, though – let MACFORMAT show you how!

More RAM means more space to run more programs, so you don't have to keep quitting one and waiting for the next one to load. And it's true: you can double your RAM for under £100 by installing a simple Extension called *RAM Doubler*, as we saw in MACFORMAT's 'Memory Magic' feature last issue. So why on earth would you want to pay good money for 'real' RAM? In short, one very important reason: *RAM Doubler* is excellent if you want to run lots of programs at the same time, but if you need to run just one very memory-hungry application – say *Photoshop 2.5*, which needs a minimum of 5Mb just to open – you must have at least that much RAM actually installed in your Mac. 'RAM Doubled' memory just won't do – and for many programs, using the 'virtual memory' feature built into recent Macs won't work either. It's real RAM or nothing.

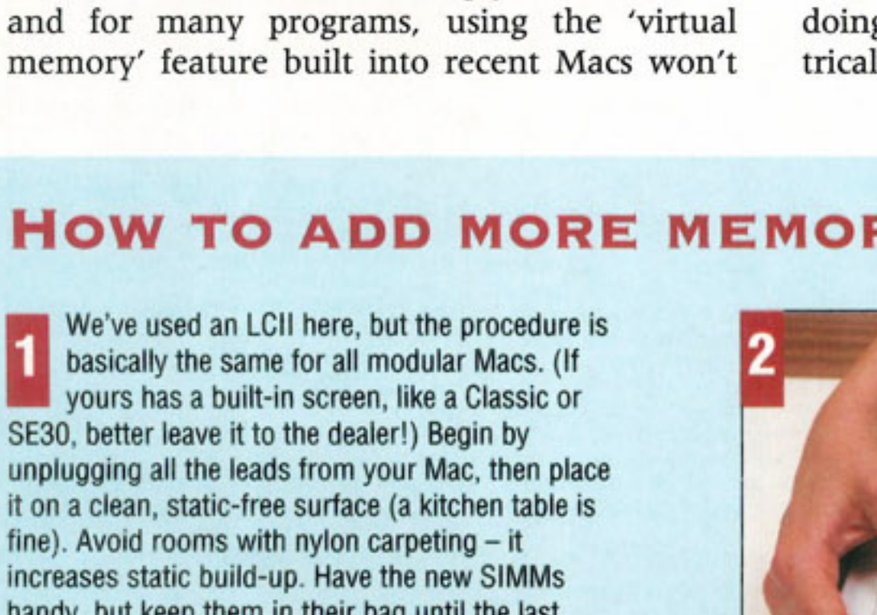
Fortunately, fitting extra RAM is straightforward. RAM comes in SIMMs – Single In-line Memory Modules – which just plug into slots on your Mac's circuit board. They come fitted with varying amounts of memory, from a quarter of a megabyte (for Classics and SE30s) up to 32Mb or more – 1Mb, 2Mb, 4Mb and 8Mb are the most common. All you have to do is open up your Mac, locate the slots and plug in the new SIMMs. Well, actually, it's not quite that simple. If you have a Mac with a built-in screen, such as a Classic, Classic II or Performa 200, you'd do better to leave the job to a dealer – the screen in these Macs retains a very high voltage charge and messing around at the back of the tube can be fatal. Don't even think about doing it yourself unless you're a qualified electrical appliance repairer with a City and Guilds, a minimum of five years' experience, and a fully-paid-up insurance policy.

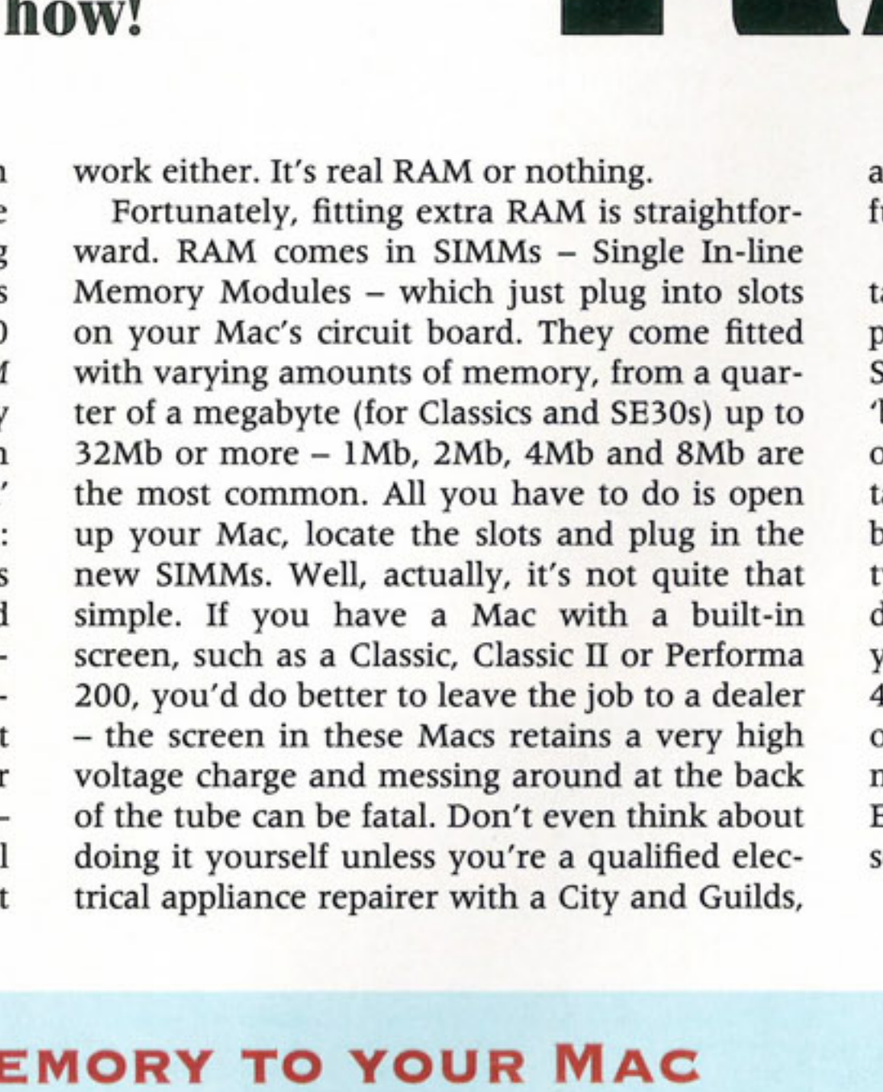
Another complication is that not all Macs take the same SIMMs. Current models use 72-pin SIMMs, but older models need 30-pin SIMMs. What's more, SIMMs are fitted in 'banks' of sockets – there are either one, two, or four sockets per bank – and on Macs that take 30-pin SIMMs you must fill a complete bank *and* fill it with SIMMs of the same capacity. An LC, for example, has 2Mb of RAM soldered on, plus two SIMM sockets. This means you can add two 1Mb SIMMs, making a total of 4Mb; two 2Mb SIMMs, giving you 6Mb in all; or two 4Mb SIMMs, making 10Mb – the maximum for an LC. Oh, didn't I mention that? Each model of Mac has a maximum RAM size – see the table for details.

There are other considerations as well, such

HOW TO ADD MORE MEMORY TO YOUR MAC

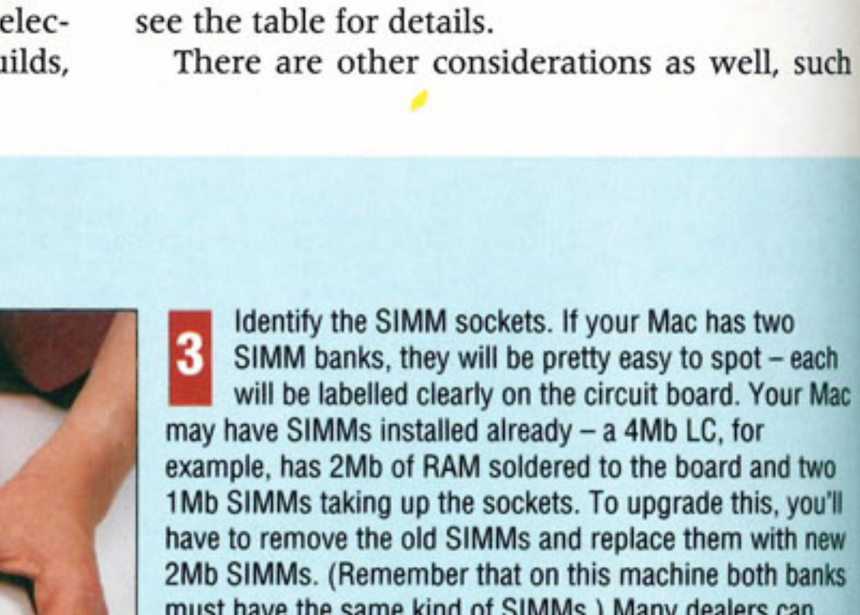
1 We've used an LCII here, but the procedure is basically the same for all modular Macs. (If yours has a built-in screen, like a Classic or SE30, better leave it to the dealer!) Begin by unplugging all the leads from your Mac, then place it on a clean, static-free surface (a kitchen table is fine). Avoid rooms with nylon carpeting – it increases static build-up. Have the new SIMMs handy, but keep them in their bag until the last minute to protect them from static.



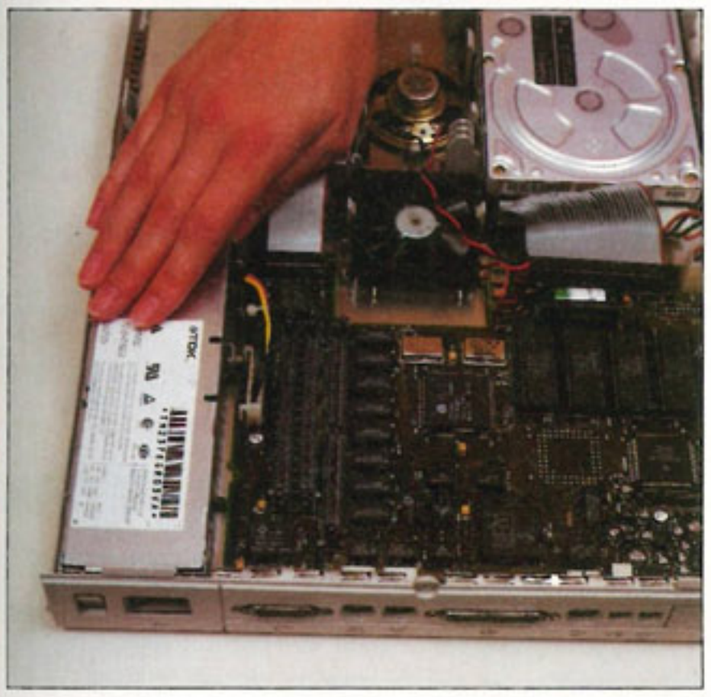


2 Remove the screw at the back of the casing and unclip the lid. If you have one of the LC family of Macs, you'll find that after you've released the clips, you need to pull the lid towards the front of the machine slightly before you can lift it clear. Put it to one side, and remove any loose fluff or dust that could fall into the Mac when you replace it. Be sure not to touch any of the circuitry inside the Mac – static electricity can ruin it.

3 Identify the SIMM sockets. If your Mac has two SIMM banks, they will be pretty easy to spot – each will be labelled clearly on the circuit board. Your Mac may have SIMMs installed already – a 4Mb LC, for example, has 2Mb of RAM soldered to the board and two 1Mb SIMMs taking up the sockets. To upgrade this, you'll have to remove the old SIMMs and replace them with new 2Mb SIMMs. (Remember that on this machine both banks must have the same kind of SIMMs.) Many dealers can supply a SIMM-removing tool that you might find helpful.



STATIC CAN KILL!



Touch the power supply casing to discharge static before you go any further. Even better, use the *back* of your hand rather than your fingertips – if there happens to be an electrical fault and the casing is 'live', your hand will be thrown away by the muscle spasm rather than clenching around the metal. And hey! Relax!

No, static electricity isn't likely to kill *you* – it's much worse than that. Static can fry the chips in your Mac and render them totally useless. Inoperable. U/S. Dead. And you don't want that. So here's MACFORMAT's advice:

1. Whenever you work on the insides of your Mac, wear an anti-static wrist strap – available from high street electronics shops like Tandy or mail order suppliers like Maplins (Tel: 0702 554161).
2. Before opening up your Mac, earth yourself to discharge any static charge you may have built up – touch an earthed object like a cold water pipe or radiator.
3. Alternatively, leave your Mac's power cable plugged in, but switched off at the mains, and when you have taken the lid off, touch the power supply casing with your hand. The casing is earthed, and this will dissipate any built-up charge.
4. Follow the precautions noted in each step of MACFORMAT's guide on these pages.

Size isn't everything

This table shows the maximum RAM you can fit to the most common Macs. If your particular model isn't listed here, you'll find details of it on this issue's cover-mounted CD stack.

Mac	Standard RAM	Maximum
Classic	1	4
Classic II	2	10
Colour Classic	4	10
Duo 210/230	4	24
IIvi, IIvx	4	68
LC	2	10
LCII	4	10
LCIII	4	36
LC475	4	36
Performa 200	2	10
Performa 400	4	10
Performa 600	4	68
PowerBook 145	2	8
PowerBook 160, 165c	4	14
PowerBook 180	4	14
Quadra/Centris 610	4	68
Quadra/Centris 650	4 or 8	132 or 136
Quadra 800	8	136
Quadra 900/950	0	64

as speed – different Macs, not surprisingly, need different speed SIMMs – so the golden rule is to make sure you tell the dealer exactly which model of Mac you're buying SIMMs for and ask for advice to make sure you're getting the right thing. If you're not absolutely sure what you're doing, ask if the dealer supplies a DIY guide – or ask whether they will do the fitting for you (many will, for a small extra charge).

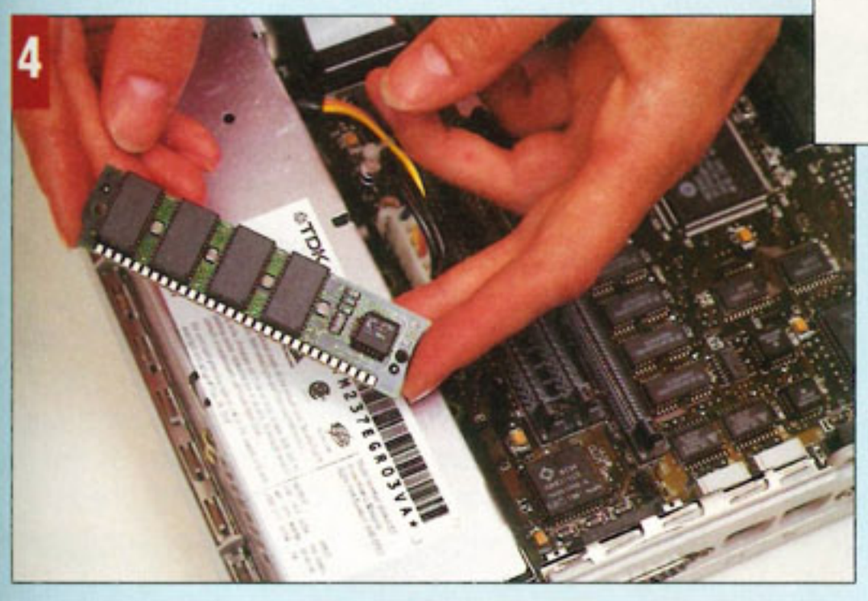
The big question is exactly how much will SIMMs cost you? As a guide, budget for about £30 per megabyte – check the adverts in this issue of MACFORMAT for exact prices (and don't forget the VAT!). And finally, a word of caution: be aware that if your Mac is less than a year old, opening it up and fitting SIMMs yourself will invalidate your warranty – meaning that if anything at all goes wrong, regardless of whether it was as a result of your efforts, you'll have to pay for the repairs. However, if you have an older Mac, adding extra RAM could be your best investment since buying your Mac in the first place.

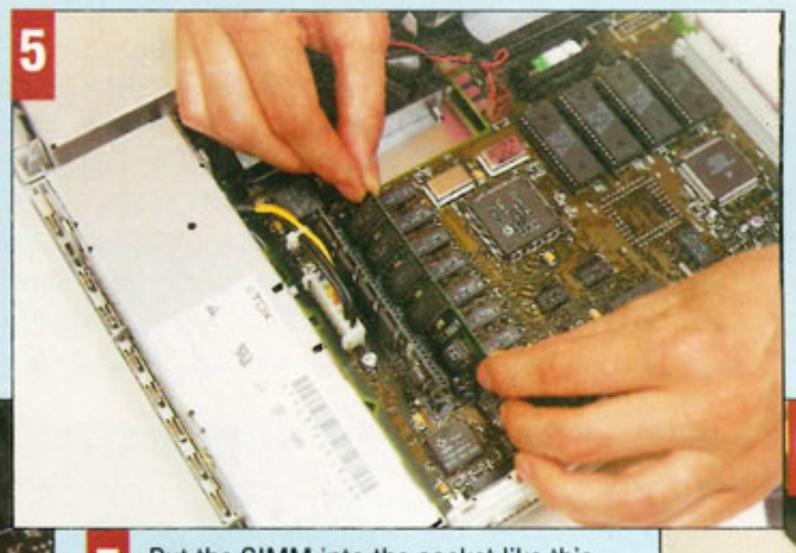
Alex Summersby

ON THE CD

Unsure where your Mac's SIMM slots are? Need to know whether they can take 32Mb SIMMs? On this issue's MACFORMAT covermounted CD there's a *HyperCard* stack that gives you all the details for all models of Mac, including portables. To use it, you need either *HyperCard* or a *HyperCard* player installed on your Mac.

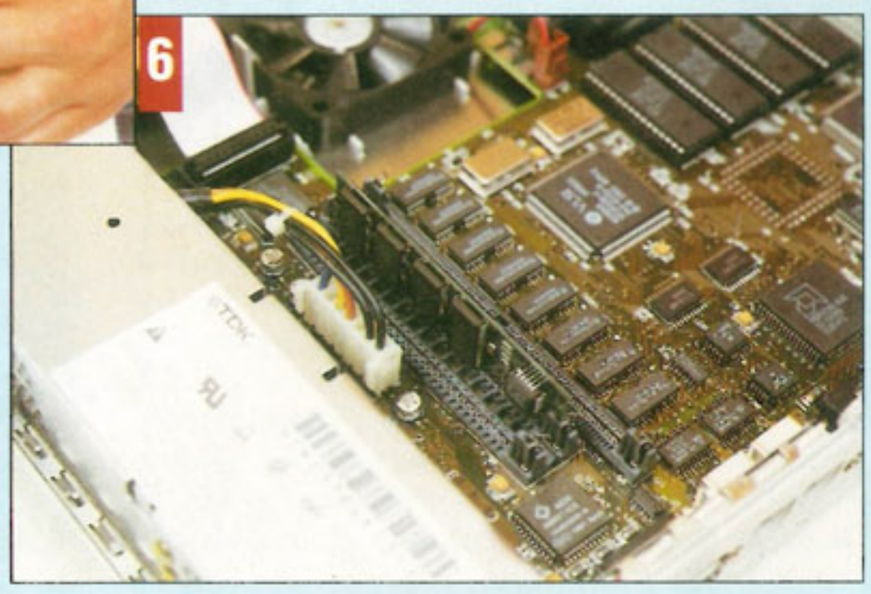
4 Take the first SIMM out of its anti-static bag. Hold it like this – by the edges only. Don't touch the edge connectors or the chips themselves. However, don't be too nervous – it really is quite difficult to damage SIMMs. (But on the other hand, don't get too blasé about the whole thing...) Now is probably a good time to double-check that you've got the right sort of SIMM – 72-pin for current models, 30-pin for older Macs.





5 Put the SIMM into the socket like this. Make sure it's facing the right way – you'll be able to tell because it's impossible to fit the thing properly the wrong way around! Don't try to force it in if it's proving troublesome – you night break off the pins, and that makes the SIMM useless. (If you do happen to bend a pin accidentally, *carefully* bend it back – but avoid see-sawing it back and forth: that will weaken the metal and may break it.) Try not to touch the rest of the circuit board.

6 Now press gently back on the SIMM until it clicks into place. You will easily be able to see how the locking mechanism works, and you should make sure that both sides of the SIMM lock into place. Then repeat the process with the second SIMM. Finally, check that the lid is dust-free, clip it back in place (making sure there are no leads or wires snared anywhere) and then replace the fixing screw at the back. Job done!



MAC ANSWERS

GOT A PROBLEM WITH YOUR MAC? WE'RE HERE TO SOLVE IT!

Whatever your Mac problems we're confident that MACFORMAT's experts can solve it. All you have to do is fill in the form on page 69 – or photocopy it if you don't want to cut up your copy of MACFORMAT – and then post or fax it to us. Include as much detail as you possibly can about your setup and the software you're running, in particular the version number (highlight the program icon to get this, then select **Get Info** in the **File** menu or press **[command] I**).

Please note that we are unable to answer questions over the phone – so there's no point ringing us up with technical enquiries. We're also unable to enter into personal correspondence – even if you enclose an SAE.

Do-it-yourself problem solving

One of the main causes of a program not working properly is something called an INIT clash – this ominous-sounding term means your program isn't happy with one of the system-level Extensions (INITs in System 6) that are running.

Fortunately, it's easy to check if this is the case. First of all, restart your Mac without any System Extensions (INITs). If you're running System 7.0 or above, that means restarting the Mac and holding down the [shift] key – a message telling you 'Extensions off' will appear. For any System version below 7.0, move all the Control Panels and INITs out of your System folder and restart the Mac.

If your program now works, it must have been unhappy with one or more of the INITs. The only way to work out which one is the culprit is to move them all out of the System folder, then put them back in one at a time – not forgetting to restart your Mac after each one – and test the program again after each one has been replaced.

TrueType and System 6

FONTS

Q 1. I use System 6. What will I need to use TrueType fonts, and to move them to the System file?
2. Also, where can I get these things, and what advantages will I get from using these fonts with my ImageWriter?
Susan Tetlow
Yeovil, Somerset

A 1. System 7 has TrueType built-in, but since TrueType appeared after System 6, you'll need the TrueType INIT, which goes in the System Folder, to handle all the required font drawing. In fact, this comes with the TrueType package; the only problem is Apple doesn't make it any more! However, the company says that if you can find it, you can use it – which I guess makes it free. Perhaps you have a friendly local dealer?

The other thing you need to check is that you're using System 6.07. You might be able to use System 6.05, but Apple never fully tested it with TrueType.

2. What you get when you print out from an ImageWriter or similar printer is what you get on screen; so if your fonts have that familiar bitmapped look to them when you try any point size beyond 9, 12, 24, and maybe a couple of others, then that's what you'll see on the printout. What TrueType does is generate a smooth bitmap (with no 'jaggies') for any point size – even when you zoom in. While ImageWriter print will never look as good as a LaserWriter's (it is a 144 dpi printer), TrueType will improve the printout greatly – especially on larger font sizes.

In order to install the fonts (perhaps your friendly dealer will have some of these, too) on a System 6 Mac, you'll need to use *Font/DA Mover* to copy them into the System file.

Sound Manager on strike

SOUND

Q My System crashed and now I'm unable to access the microphone or any other sounds – except for the straightforward beep. Also, now when I'm running a QuickTime *movie, it says there are problems with the* Sound Manager. *I'm not sure if this is a software or hardware problem.*
Alan Girvan
Alexandria, Strathclyde

A Well, the good news is that it's unlikely to be a hardware problem. The *Sound Manager* is part of the System software and can, therefore, be replaced by a new copy if it's damaged. However, I'm not sure from the details you've given me whether it will be a separate file, as above, or whether it's built into the System; Apple has recently released *Sound Manager version 3*, with new capabilities, but this isn't built into the System file. You'll find it on the Hardware System Update 2.0 disk instead. Again, you should be able to replace the file with a fresh copy from your System disks.

For all those people out there who would really like to play *X-Wing* on their Mac, here's a screenshot from the PC version. There, doesn't that make you feel so much better?

Converting from the PC

GENERAL

Q Does Lucas Arts intend to release its classic and flippin' brilliant space flight simulator X-Wing *on the Mac? If not, is it possible to convert a PC version to Mac format?*

Second, do PC-compatible CDs work on Macintosh CD-ROM drives?
Dominic McNeice
Sudbury, Suffolk

A No, I'm afraid there are no plans to convert the game at the moment – and no, it's not possible to convert the PC version... well, not unless you're a programmer at Lucas Arts, that is! Whenever a PC game is released on the Mac, or vice versa, that's basically what the programmers do: convert the code to run on the other platform. Lots of it will be quite similar, but certain portions – drawing the screen, for instance – will need extensive rewriting. This is because of the differences between the Mac and PC-compatible machines.

It's possible to run PC games on the Mac (in theory, at least) by using an emulator such as *SoftPC*. However, as you only have an LC II, this could be rather slow. I've never actually run *X-Wing* using *SoftPC*, but programmers have a tendency to break the 'rules'. So instead of using the standard commands, which *SoftPC* is able to understand, they often control the hardware, such as the monitor directly. Games writers – in their quest for speed – are particularly notorious for this. In fact, there's no guarantee that a

PC game will work on every PC, so running one on a Mac would be doubly difficult.

As a rule, PC CD-ROMs won't work on the Mac. The CDs themselves will be recognised on the desktop, but the programs won't actually run just by double-clicking. If the CD contains data (such as clip art images) rather than programs, however, it is possible to read it. You may need to change the document type (*ResEdit* will again come in handy for this) from the default DOS type to TIFF, but if you're running *AccessPC*, *PC Exchange* or *DOS Mounter*, this shouldn't be necessary.

Fraction of the price

FONTS

Q *Is there any way of obtaining fractions, for example ½, ¼, ⅝, 3/16, etc, without buying more software?*

RA Perkin
Ross-on-Wye, Hereford

A The simple answer here is 'no', but obtaining a font which can produce fractions shouldn't be too costly a task. You don't say what sort of printer you have, but generally the rule is that you get what you pay for. So with luck, you'll be able to get bitmap or even TrueType fonts as shareware.

If you're using *ClarisWorks*, you can make an attempt at fractions by combining superscript and subscript. If you have *QuarkXPress*, ask your dealer about an XTension called *Quark Freebies* which enables you to generate 'true' fractions – as the name suggests, it's a freebie.

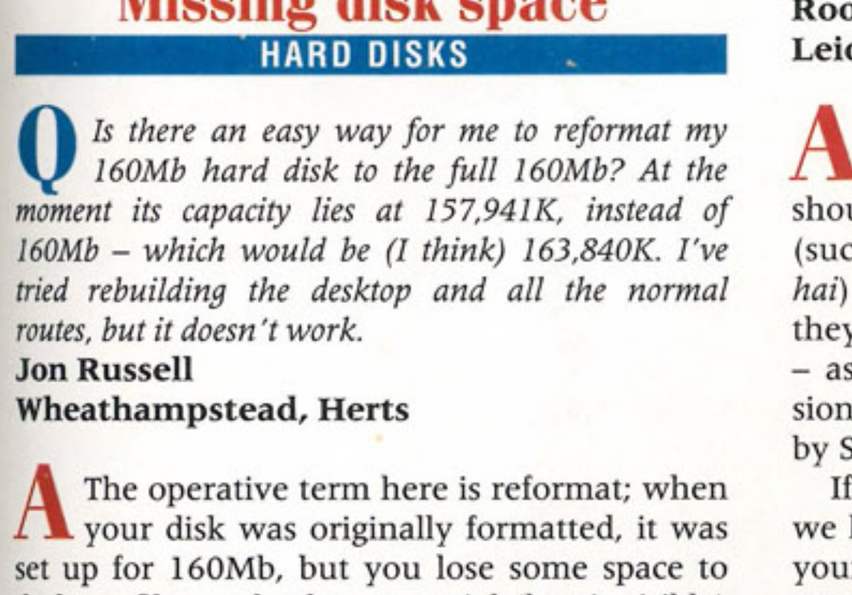
Missing disk space

HARD DISKS

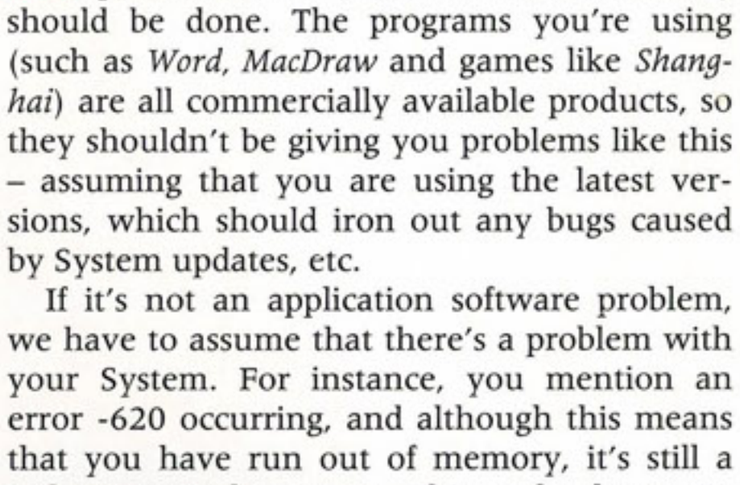
Q *Is there an easy way for me to reformat my 160Mb hard disk to the full 160Mb? At the moment its capacity lies at 157,941K, instead of 160Mb – which would be (I think) 163,840K. I've tried rebuilding the desktop and all the normal routes, but it doesn't work.*

Jon Russell
Wheathampstead, Herts

A The operative term here is reformat; when your disk was originally formatted, it was set up for 160Mb, but you lose some space to desktop files and other essential (but invisible) data. You can't regain this space by rebuilding the desktop, so you'll need to back up your data on another hard disk or on floppies, and then reformat the disk. If it's an Apple drive, you should use the *HD Setup* program, which is on the *Disk Tools* floppy. Then select **Custom**, followed by **Partition** to maximise your space.



The *HD Setup* program comes free on your System disks. You know, those disks you put in a really safe place so you wouldn't lose them. Now, was it the desk drawer? Or the attic? Or, um…



Yes, you too can gain an extra megabyte of disk space by reformatting your hard disk. The only problem is finding enough floppies to put your precious work on.

No escape

SYSTEM CRASHES

Q *From the very beginning, I've had System software problems with my LC III – especially when using games. The most frequently occurring ones are:*

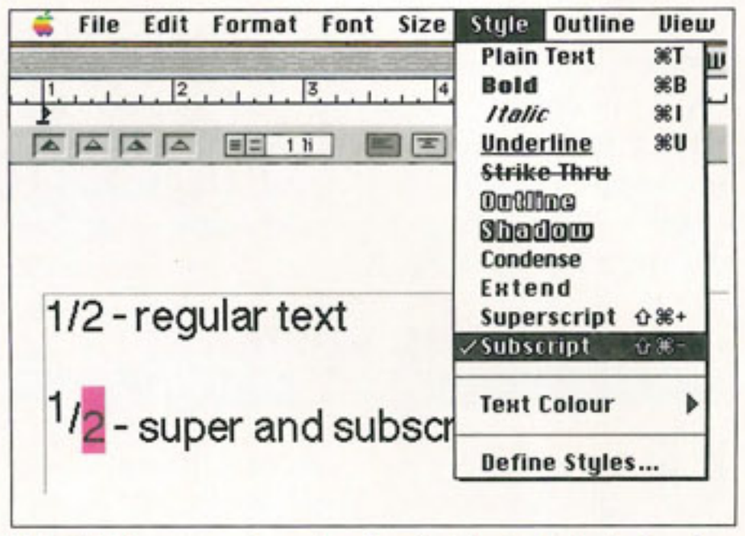
1. I get completely stuck in the program – the cursor doesn't move and in some cases **[command] [option] [esc]** *doesn't work either, so I have to force a restart.*

2. I get thrown out of the program, with a System message to the effect that 'a System error occurred' or 'program unknown unexpectedly interrupted' with error code 3 or 1.

Roos Vonk
Leiden, The Netherlands

A With problems as severe and as apparently random as this, it's clear that something should be done. The programs you're using (such as *Word*, *MacDraw* and games like *Shanghai*) are all commercially available products, so they shouldn't be giving you problems like this – assuming that you are using the latest versions, which should iron out any bugs caused by System updates, etc.

If it's not an application software problem, we have to assume that there's a problem with your System. For instance, you mention an error -620 occurring, and although this means that you have run out of memory, it's still a rather unusual message. This and others you mention are really too obscure to come up in normal circumstances. I'd therefore suggest that you reinstall your System. This will put a 'fresh' copy of the System software on to the hard disk. If you run the installer on Install1 (Installatie 1 to you), it will update your System without actually removing any of your files.



Highlight the second number (leaving the backslash alone) and choose **Subscript**. It often looks better if you also reduce the size of the numbers by a couple of points.

The sound of silence

SOUND

Q *I want to record sounds on my LC475, and I want to do it using the external microphone included with my father's Quadra 950. But although I record sounds just as described in the manual, when I'm finished I can't hear the sound I've just recorded. Yet when I recorded a sound on the Quadra using the same microphone, and then copied it to the LC475, it was OK.*

PS I'm not deaf. Really.

Adam Protasiuk
Gdansk, Poland

A I can confirm that you have no hearing problems, but rather an incompatibility problem between your LC475 and the Quadra's microphone. The 475 – along with other new machines, like the PowerMac and AVs – use the PlainTalk microphone. These machines can't use the old 'low-level output' microphones found on most other Macs. The PlainTalk mike needs additional voltage from the Mac's logic board to amplify the signal. Its

JARGON BUSTERS

DIP switches – a row of eight or so on/off pins set under the cover of a printer, which determine settings that generally override software instructions.

RISC – Reduced Instruction Set Chip. A microprocessor which is optimised for top speed by stripping out more complex features.

Unix – an operating system used in mainframe computers. Famous for being hard to use.

AIX – Apple's version of Unix for the Mac.

PowerMac – the next generation of Macs designed to use the PowerPC RISC microprocessor chip.

plug is also around 0.25 inches longer, so, even without the voltage problem, the Quadra mike would be incompatible. The LC475 doesn't ship with a microphone as standard, so if you want to record sounds, I'm afraid you'll need to order a PlainTalk mike from Apple – ask for part number M9060Z/A.

Missing memory?

MEMORY

Q *Every time I try to play* Maelstrom, *a dialogue box appears saying there's not enough memory. I bought my Performa 400 with 4Mb of RAM and an 80Mb hard disk. So how come it can't open a program which only needs 2.8Mb?*
Benny Pruvoost
Meulebeke, Belgium

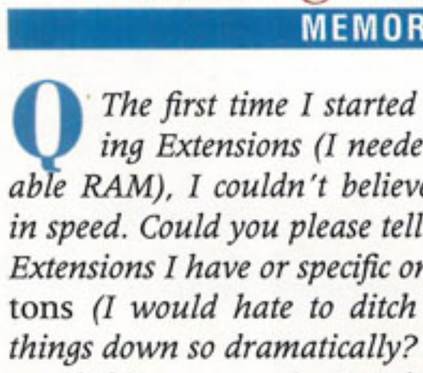
A The important part here is the RAM – that's what the program needs to run. Although you only need 2.8Mb to run the game, the System also requires RAM and, in this case, it clearly needs more than the 1.2Mb left. Since the System starts up when you start the Mac – and therefore before you load *Maelstrom* – there's less than the required 2.8Mb left. You could try restarting without Extensions (by holding down the **[shift]** key). It will be tight, but this might just free enough memory to run the game. If not, you'll either need to switch on Virtual Memory or buy more RAM.

If Virtual Memory is for any reason impractical (because it makes the game or program run too slowly, say), then you can usually purchase additional RAM for most Macs – and certainly for your Performa 400. You can either get this through mail order and fit it yourself (see our 'Upgrade your RAM' feature on page 64 for details on how to buy and install extra RAM), or go to your local Apple dealer and get an experienced technician to fit it.

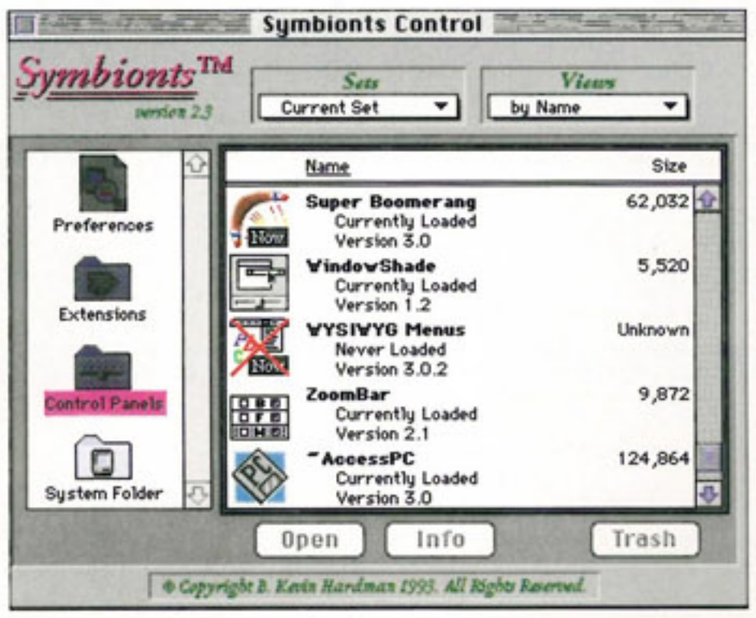
Limiting Extensions

MEMORY

Q *The first time I started my Mac without loading Extensions (I needed to increase the available RAM), I couldn't believe the amazing increase in speed. Could you please tell me, is it the number of Extensions I have or specific ones such as* Greg's buttons *(I would hate to ditch this) that are slowing things down so dramatically? Would extra RAM help speed things up, or just enable me to run more programs simultaneously? Or perhaps a maths co-processor?*
Bryan Hurst
Reading, Berks



To change the amount of memory a program is allocated, click once on the application's icon and select **Get Info** from the **File** menu. With System 7.1, you have the extra option of a prefered size and a minimum size. To see how much free memory you can allocate, select **About This Macintosh** from the **Apple** menu.



The *Symbionts* program is an excellent way to see which System Extensions are using up all your precious memory, unfortunately it can't help you decide which ones to delete.

A Of course, I don't know how many Extensions you have loaded, or exactly what you mean by an 'amazing increase' in performance. The general rule, however, is that the more RAM you have available, the faster programs will run; this is because your Mac can get more of the code it needs into RAM when it starts up, so it doesn't have to go back to the program file on the hard disk – which is much slower to access than RAM. Also, everyday functions, such as switching between programs, will be faster if you have a lean and healthy System Folder, rather than one that's full of Extensions and Control Panels.

Different Extensions take up different amounts of RAM; in fact, the *Symbionts* program (which we included on the April issue's cover disk) will help you decide what you can afford to keep and what is eating more RAM than it deserves.

A maths co-processor won't do you much good in terms of increasing speed, unless you're using programs that actually involve a lot of mathematical calculation. Obvious examples of this are spreadsheets and CAD programs. Other programs which could benefit are Aldus *PrePrint* and Adobe *Photoshop*, which involve colour mapping and other functions that require intensive mathematical work. A better bet for the general user would to be look at an accelerator board, which will speed up all aspects of operation.

Accent-uating your French

FONTS

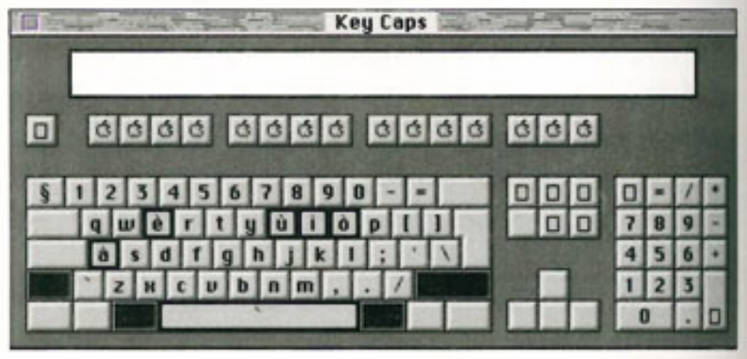
Q *I need to type some French names. Although many fonts have Greek characters, I can't figure out how to get 'E's with circumflex, acute and grave accents. Is there a trick, or do I need French fonts?*
Matthew D Shaw
London

A On this occasion, you'll be happy to hear, there is indeed a 'trick', which is, in fact, built into almost every Mac font – to cover not only French but just about every other European language (except Welsh!).

You actually have to hit a combination of keystrokes to get the character you want – first the double-stroke representing the accent you want, then the letter you want it over. So for é, you first hold down the **[option]** key and **E**, and – ta da! – nothing happens. But if you release both keys, then hit the **E**, the combined character will appear. **[Option] E** are the first keys for the acute accent, no matter whether the next character is **A**, **E**, **I**, **O**, or **U**. It's a similar procedure for a grave accent, except you first use **[option]** ` (you'll probably find this just beside the spacebar), then the **E**. For à, you use **[option]** ` then the letter **A**. For the ¨ character, simply press **[option] U** followed by the appropriate letter.

If you access the *Key Caps* DA in your Apple menu and depress the **[option]** key, the accent characters will be highlighted. If you then choose an accent, *Key Caps* will indicate on which letters the accent can be used. The full range is listed below:

Accent	Keystrokes	Letters
´	**[option] E**	a, e, i, o, u
`	**[option]** `	a, e, i, o, u
¨	**[option] U**	a, e, i, o, u, y
^	**[option] I**	a, e, i, o, u, c
~	**[option] N**	a, o, n
ç	**[option] C**	no letters needed
ß	**[option] S**	no letters needed
å	**[option] A**	no letters needed



Key Caps comes free with your System software and is actually very useful. If you own *Norton Utilities*, then you may want to install *Keyfinder* which is a superior application.

Flat batteries

BATTERIES

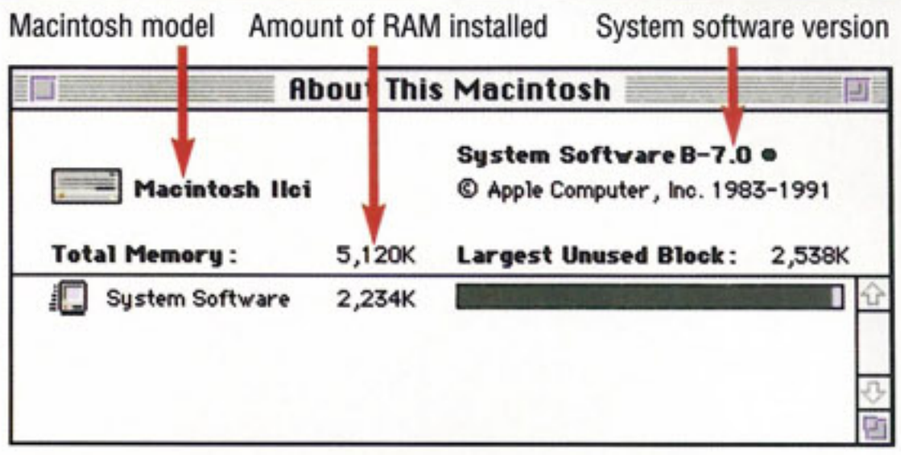
Q *Every time I switch on my LC 10/40 the date is set to 1956, the sound is reduced to volume three, the blinking is off, the Chooser turns to AppleTalk, etc. Is the internal battery running out? And if it is the battery, what sort do I need, and can I replace it myself?*
Simon Collins
Leeds

A You're right, Simon, it is all due to the battery. In older Macs the date would reset to January 1st 1904 (it has been rumoured that 1904 was the year Steve Jobs's father was born, but who knows). In fact, this date was no use, because Macs which last out till 2004 could well have files on them with the same creation dates as those from a few years back. 1956 is a bit more reasonable, though, because it will give current Macs a 60+ year lifespan, rather than the 20 years the Mac Plus was given. Having said that, the clock on a Quadra will reset on New Year's Day 2019, looping round to 1920 after the bells.

As to the batteries, with the old beige Macs you could pop out the battery and change it easily – it was an HP7, which sat at the back beside the power switch. For a time (with the Mac II) batteries were soldered to the circuit

HOW MUCH RAM HAVE YOU GOT?

Obvious but true: even the same models of Mac can have different amounts of memory or run different System software. To solve your problem, we need to know all about your setup, and this is where you can find out. Make sure you are in the Finder, point to the Apple menu and go to the first item About This Macintosh, then release the mouse button.



board, so if the dealer couldn't use a soldering iron, you had to get a new board when the battery went. Nowadays, the lithium battery just pops out. It shouldn't be too expensive, although you probably won't find one at your local electrical store. Check with your local Apple dealer.

The silent treatment

SOUND

Q *I was playing the game* Maelstrom *(which I received free on* MACFORMAT*'S January cover disk) for the first time, and during the course of the game all the sounds stopped.*

Since then, I've been unable to get any sounds out of any of the programs on my Mac. I've been into the Sound Control Panel, but nothing is 'bleeping', even though I've adjusted the volume, tried different sounds, and even inputted a new sound. I've switched off and rebuilt the desktop – all to no avail.

Gordon Young
Dalkeith, Midlothian

A Ignoring the possibility that this could be a hardware problem, I'd say that for some reason, part of your System software has been damaged. The most likely thing is that the Sound Control Panel itself needs replacing. You could do this simply by getting out your System disks and finding the disk with the Control Panels folder on it (it's probably called 'Tidbits'). All you have to do then is copy the Sound Control Panel into your System Folder (with System 7, it will automatically replace the old one). This should do the trick. If not, the damage could be within the System file itself. If that's the case, you may need to reinstall the System.

Portable CDs

CD-ROM

Q *Is there a reason not to hook up a CD-ROM to a PowerBook 160, or are some CDs more compatible with PowerBooks?*

Karl Koch
Hamburg, Germany

A The PowerCD is an attractive option. If you want a CD-ROM drive for a PowerBook, it certainly makes sense to get a portable one. The PowerCD is a bit pricier than the purely mains models, but it does have the advantage of enabling you to play audio CDs without being hooked into a Mac and, if you connect it to your TV, you can also use it to look at PhotoCD images. *Stuart McHugh*

MACANSWERS

If you send in a question for the MACFORMAT experts to solve, please fill in and include this form (or a copy of it). And please make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to:
Mac Answers, MACFORMAT, 30 Monmouth Street, Bath BA1 2BW, or fax it to us on 0225 446019.

Name .....

Address .....

.....

.....

Your Mac
(For example, Performa 200, IIfx, PowerBook 145):

.....

.....

Approximate age of machine: .....

System version
(see About this Macintosh screenshot above):

.....

Amount of RAM
(Total Memory figure from the About This Macintosh dialogue box):

.....

Are you using virtual memory? .....**YES/NO**
(This is accessed from the Memory control panel under System 7)

Do you have 32-bit addressing turned on? .....**YES/NO**
(This is accessed from the Memory control panel under System 7)

If your Mac has an external monitor, list the make and model; if you are using a video card, give details:

.....

.....

.....

Details of any SCSI devices connected
(eg CD-ROM drive, hard drive, scanner):

.....

.....

Details of any other relevant hardware which could help us to answer your question:

.....

.....

.....

Now, use this space to describe your problem or question. Include as much relevant information as possible. Please continue on a separate sheet if necessary.

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Picture perfect

Photographs can add significantly to the impact of your publication – if they're good, that is. Discover what makes a 'good' picture and how to use it to best effect in your small publication.

Good picture editing is one of the simplest ways of enhancing your publication. Better briefing of photographers, along with better selection and handling of pictures, can make a huge difference. Photographs are often the first thing your readers see and may leave an impression long after they have forgotten what they were reading.

Good pictures do more than just providing information about what people and things look like. They can startle and amuse and draw the reader in. They can make their own comment on the subject matter. But a bad picture (see any local free newspaper or company journal for examples) is a wasted opportunity that can kill a page stone dead. So what does make a good picture? Three things really: 1. Content. 2. Timing. 3. Quality. Of these, the last is the most elusive, but perhaps the most important.

Content is obvious. If you have a story about your team's new striker, you don't really want to illustrate it with a picture of the one he's replacing. If you're doing a personal profile, your readers will want to see a current photo of the person. If a new building is causing an uproar, your readers will want to see what it looks like. On other occasions the picture is the starting point, with the words coming later. And then it must be startling, surprising, disturbing, revealing or particularly beautiful in its own right.

Timing means your picture should have been taken at the right moment. You want the picture of the runner as he crosses the finishing line, not while he's taking his spikes off later. Naturally, the motor-drive camera helps.

Of course, most pictures are not about such dramatic events. They are about things happening to people. But the question of timing still comes into play. Someone once defined the job of the photographer as being to 'find and catch the story-telling moment'. And that moment can be as fleeting as a facial expression: the pride on mum's face at the school prize-giving; the misery of the commuter watching the 'train cancelled' notices appear on a snowy night.

Most stories are reconstructed after the event by reporters who weren't there at the time. The same goes for photography. This need not be a problem: the story-telling moment may not be the same as the story-happening moment. The wreckage of the plane may tell the story as well as the picture of it dropping from the air.

Creating the moment

Very few photographers can afford the luxury of simply observing what goes on. If no story-telling moment exists, the photographer has to make one. He becomes a kind of film director, moving his subjects, scenery and props until he gets the photograph he wants – the single picture that tells the story.

Probably 90% of the pictures you see, particularly in local newspapers, will be this kind of 'set-up'. If you are producing a publication, there will be events you'll be expected to cover. Any editor can produce a list of unpromising subjects for photography. Here's mine:

1. Cheque presentations.
2. Retirement parties.
3. People in offices, on the phone, or working at computer keyboards.
4. Bad drains, damp flats and other poor but unphotographable housing problems.
5. Awards ceremonies and prize-givings.

The truth is, if you just let these things happen and try to photograph them, you will never get a usable picture. Most of these events involve people shaking hands and handing over anonymous pieces of paper. But that isn't the story. The story is what has happened in the past, and the emotion now. If the retiring person is a teacher, photograph her with the children, not with her colleagues. If somebody's won a prize for art, show them painting. Set up your pictures, but make them fresh set-ups.

Getting the right subject at the right time is no guarantee of excellent photography. You also need what might loosely be called *quality*. Your pictures must have a sense of life. Your subjects must be doing something, or thinking, or speaking, or feeling. You don't want them looking self-conscious because they know

Try to ensure your subject looks relaxed and natural – even if it means interrupting their work. (Sorry, Sally.)

there's a camera pointed at them – that's why small children under about five and animals head my list of promising picture subjects:

1. Small children.
2. Animals.
3. Dramatic scenes: cars turned upside down, trees uprooted, etc.
4. Extremes of emotion.
5. People having fun.

Mostly, though, you'll have to arrange people. As they say in show biz, "Sincerity is everything; if you can fake that, you've got it made". In photography, the same could be said of spontaneity. People obviously posing, looking at the camera and saying cheese, are bad news. You want people looking relaxed and natural – even if they're not. Take lots of shots; get the relaxed smile that comes after they think you've *finished* taking their picture.

Be meaningful

Another aspect of producing quality photographs is creating a *meaningful* picture. The whole picture needs to express the subject. If you are illustrating a story about cutbacks in education, you are fighting a losing battle if you try to do it in the education department's offices. You need a school and some children. If you are profiling a famous artist, you don't want him photographed during a visit to the chiropodist. If it's a train strike, you want trains – or the lack of them.

Those meanings are self-evident. But often you can add a symbolic layer of meaning by the use of props and settings. A picture of a prominent politician walking on an empty windswept beach is saying that life is lonely at the top. If you photograph a company boss and he has a bust of Napoleon on his desk, isn't that telling us something about his management style?

Another aspect of quality is technique. Obviously, you want your photographs to be in focus and exposed properly. The point of focus in a portrait will normally be the person's eyes. If you are supplied with prints they must have a full range of tones. Software can make areas lighter or darker, but it can't find detail that is not there. And remember, printing processes invariably reduce the quality of your original.

A more creative area of technique is composition. One way the photographer enlivens potentially dull material is to look, quite literally, for new angles. Extremes work well; get up high and look down on what's going on. Or look up from knee-level. If you have to do a group of people, arrange them in a way that expresses the relationship between them, or that simply catches the eye.

A good picture needs drama. Contrasts in scale are important. If your story is about a huge pothole in the ground, its size needs to be dramatised. Put a small child at the bottom of it. Anything that will provide a sense of depth is valuable too, like framing devices or strong parallel lines leading into the picture. The principles of graphic design that we discussed earlier in this series still apply: diagonal lines express energy and movement. Look at the best sports pictures and you will see this in practice.

Picture editing

For you, as an editor, the most creative part comes when the pictures are presented to you. Traditionally, for black & white work, this would have been as a series of contact prints, each the same size as the negative. Nowadays, it may be in some electronic form, perhaps on a PhotoCD disc. Hard copy is easier to work with.

Your role at this stage is obviously limited in comparison to the photographer's, but you can still do a lot. Picture editors have always been able to select, size, crop and order special printing effects – special screens, line conversion, posterising, solarising and so on. The new picture manipulation software, of which *Photoshop* is the most widely-used example, brings all of that to your Mac; but the expense of scanners, powerful machines and software, storage devices and the rest means that for many low-end publishers, traditional methods are best.

To edit pictures you must look at them much more closely than you normally would. Is the picture in focus? Does it make true eye contact? (For a cover, you usually want that.) Are there any unnecessary things in the picture such as unwanted intrusions or spare people? Does the background create any problems? Why is there a standard lamp protruding from the subject's head?

Having selected the picture you want, you have to consider the size you want to use it at. Obviously, crowd scenes make little sense if the pictures are the size of a postage stamp. But beyond that you have to use your judgement.

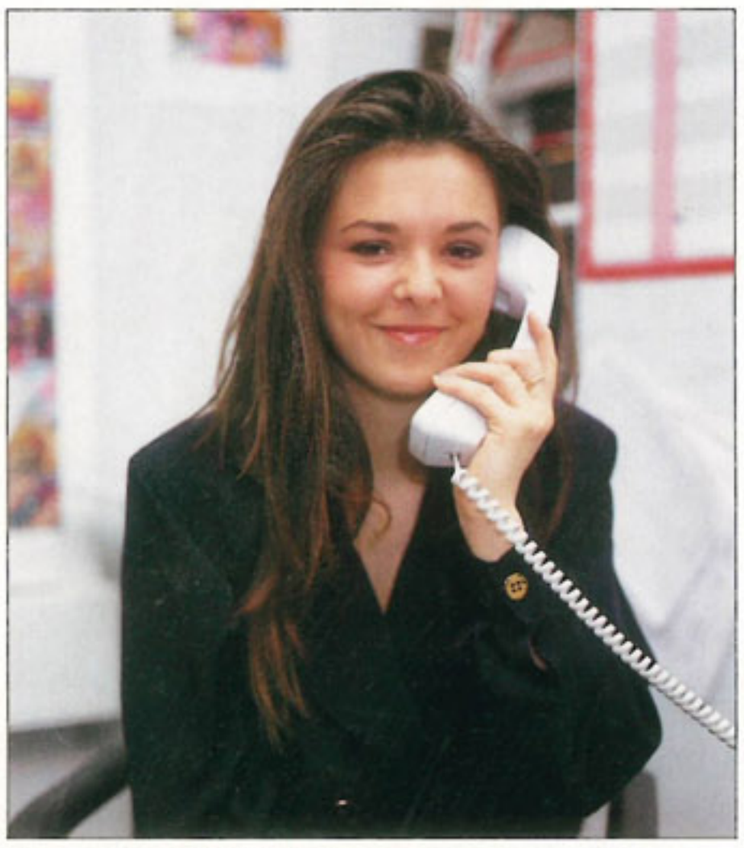
In the past, the only limiting factor was the quality of the original. A 35mm original could be blown up to the size of a magazine page if the focus was sharp enough and the film wasn't too grainy. If you are scanning pictures in, that all becomes more problematical. It's a question of scanning resolution and the liberty that gives you to change the size at which the picture is used. It's far too complicated to go into here, but in general you need to know what size you are going to be using the picture and scan it at the right resolution. Try to blow it up afterwards and you'll get a result that looks every bit as bad as a poor photographic enlargement.

Cropping is the key decision-making process. Robert Capa, the great war photographer, once said, "If your pictures aren't good enough, you aren't close enough." Cropping enables that deficiency to be remedied. You can select the bit *you* want from the picture. That way you can find, or enhance, the drama in a shot. Or you can remove any irrelevancies so that the eye is directed to the main item. You can make several pictures from a single photograph, or make a background feature into the main subject.

All of these crops can be tried out either with a print and a pair of L-shaped bits of cardboard (the best way) or on your Mac screen with your layout or photo-processing program's cropping tool. Interestingly, the claims of a program such as *ClarisWorks* to be useful for DTP are exposed at this point: it has no cropping tool. It's true that with the new version of *ClarisWorks* you *could* import a photograph into a paint document and crop it with the 'marquee' tool. Then you'd have to cut and paste it into the drawing or word processor document in which you were struggling to make your page layout. This is still not a patch on having a proper DTP package with a cropping tool, though. Such a tool is available in *Publish-It! Easy*, *PageMaker* and *Photoshop* (this one will rotate the image and crop it at the same time, if you want). In *QuarkXPress*, you first put your image in a box, and you can then re-size the box without resizing the image, or move the image around in the box to select the bit you want – but this is not quite the same thing. It may look the same, but the complete picture data is still there (that's what makes it possible to move the image around), meaning that the document is bigger than it need be and takes correspondingly longer to print out (the program will render the whole image, even the 'hidden' bits, in memory and only then realise it has to print just the bits that are showing). So if you can, crop your picture in another program before importing it into *QuarkXPress*.

Cropping is particularly effective when it comes to dealing with simple mug-shots – the human face staring out. Local papers and house

Look for new angles when taking photographs – this potentially dull photo of Andy Storer at his desk has been given, quite literally, a whole new perspective.



The background in this picture is unnecessary and serves only to detract from the main subject, Louise.

By cropping the picture, attention is concentrated purely on the subject, making for a more immediate picture

For maximum impact, the picture has been cropped in close around the face – a simple way to create a dramatic shot.

journals often use dull pictures of people floating in a sea of space. Cropping in close, so that there is little dead air around the face, gives more impact. Indeed, you can crop a long way into the face itself before things start to look absurd. (Usually at the point where it looks like the person's peering through a letter box.)

If the angle of the photograph is such that the person has only one ear visible, it is often a good idea to crop the other one off too. It sounds bizarre, but try it and you will see what I mean. You can also crop a mug-shot at an angle; it makes the person look deranged or simple-minded, which might be your intention.

Another aspect of cropping is to change the shape of the finished picture. It is a good rule that the picture itself should dictate the shape that is used. At the same time, be aware that the further away from a square you get, the more impact the picture will have. As for positioning a face within the frame, the painters of Renaissance Italy felt that it was best to have one or other eye on a diagonal.

The other area that has now become available to picture editors and designers is electronic manipulation. That used to mean a long, tedious and smelly time in the darkroom, but now you can do it on the Mac using *Photoshop* and programs like it. Where does this start to become an ethical problem? Most designers will, at some stage, have flipped a picture so that the person looks into the page rather than off it. Cover pictures are habitually touched up to remove blemishes. You can make a picture more grainy to give it a stark, political feel. All this is manipulation.

Taking liberties

But these are mild examples compared with the creation of new pictures showing things that never happened. *The Sun*, for instance, recently illustrated a story about a monk having an affair by picturing him walking in full monastic garb with his girlfriend. It never happened; the picture was made up on screen.

I recently sat with a *Photoshop* expert while he showed me what he could do. He took a picture from a newspaper showing two Israeli boys with machine guns. He removed one boy's skull-cap and used the 'rubber stamp' tool to replace it with more hair. He changed the Israeli flag in the background to something neutral. He used the pen tool to cut out the background sky and change the weather. Suddenly we weren't in Israel any more – and it all happened in seconds.

It seems that one day a law (or some voluntary code) will be introduced to ensure that montages and manipulated photographs are labelled as such. In the meantime, there are constraints to discourage you from doing such things. Under the copyright laws, the photographer has a 'moral right' over his works, and that includes the right not to have them mucked about with. Secondly, any change you make to a person's image must not libel them. Recently, *Esquire* magazine placed Virginia Bottomley's head on the body of an underwear-clad glamour model. The accompanying text made it clear that this was a montage; any attempt to suggest that the Secretary of State for Health had actually posed semi-naked would have been actionable under the libel laws.

The key thing to remember is that as an editor you are the one who takes responsibility for your publication, legally, morally and ethically. Personally, I have always liked montages as an amusing way of making a point. But I don't think they should be used to deceive, whether *Photoshop* permits it or not. *John Morrish*

HOW TO GET GOOD PICTURES

There is an abundance of sources of copyright-free illustrations – see the features on using clip art in MACFORMAT issues 10 and 11. (If you missed those, see page 112.) There are lots of sources of photographs as well – picture libraries such as the Telegraph Picture Library (Tel: 071 987 1212), the Image Bank (Tel: 071 240 9621) or Comstock (Tel: 071 351 4448). Often, they offer pictures on disk, ready for importing into your Mac programs. But these will be stock pictures of stock situations – sunsets, mothers with babies, old men playing chess in the park, that sort of thing – and they can prove prohibitively expensive for small publications. PR companies will sometimes dish out pictures of people and things that are useful for playing around with, practising your skills, but they won't be of any specific use to you.

Some small publications habitually 'lift' photographs, scanning them in from other magazines and sometimes modifying them with *Photoshop* or more basic scanning software to make them slightly less identifiable. This is as illegal as pirating software – and you're more likely to get caught. You can safely assume that any picture you are likely to want belongs to someone, and they will want paying.

Still, we are a nation of amateur photographers. If you are producing your own publication, you should harness that latent skill. Find someone to take photographs for you. This can be a challenging and worthwhile exercise for both sides, especially if you take it seriously. Brief your photographer on what you want, whether that is as general as 'a selection of pictures of the carnival' or as specific as 'the winning rider, standing behind his bike, against a white background, looking at the camera and holding the trophy in his right hand, all the while smiling triumphantly'.

Sometimes the best results come from letting the photographer use his or her own imagination. Give them a photo essay, say 'the school fete', and let them go free. But if there are pictures you must have, make sure you specify those in detail and insist on them being done.

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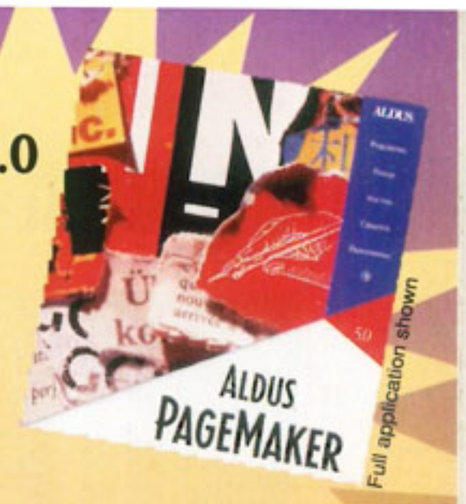

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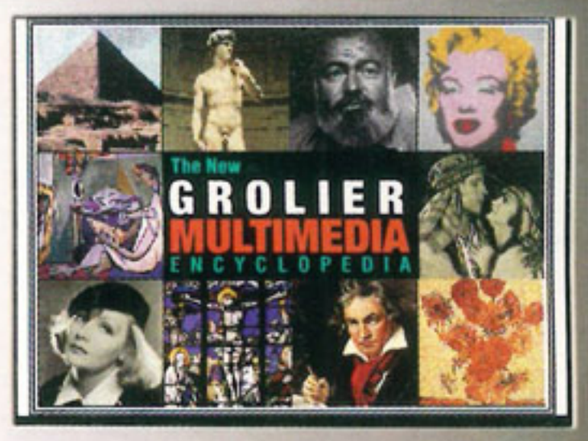

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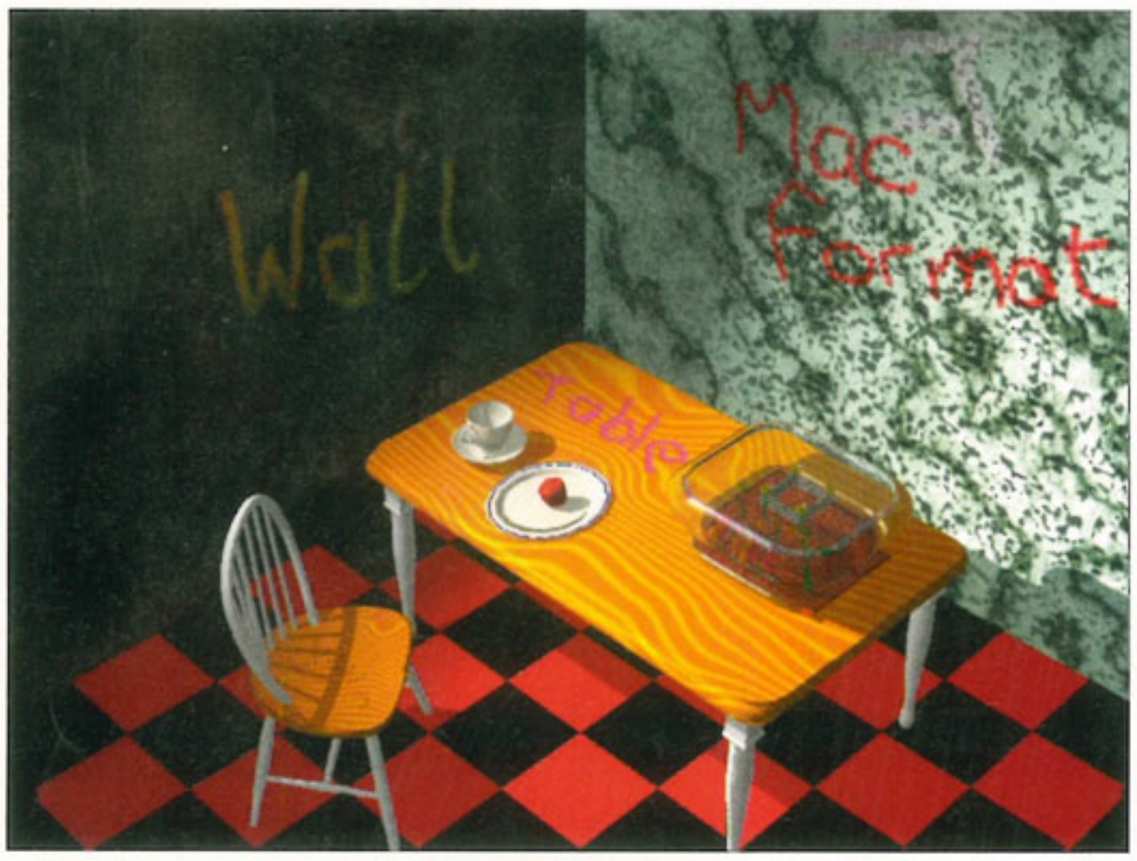


The interior designer should be shot. As for the graffiti artist – he really should get out more.

For breakfast, there's nothing like a nice cup of tea… with a big bowl of goldfish.

Virtual *dreaming*

What would you call a 3D package with an innovative interface, some useful new tools and an excellent renderer – a day dream come true?

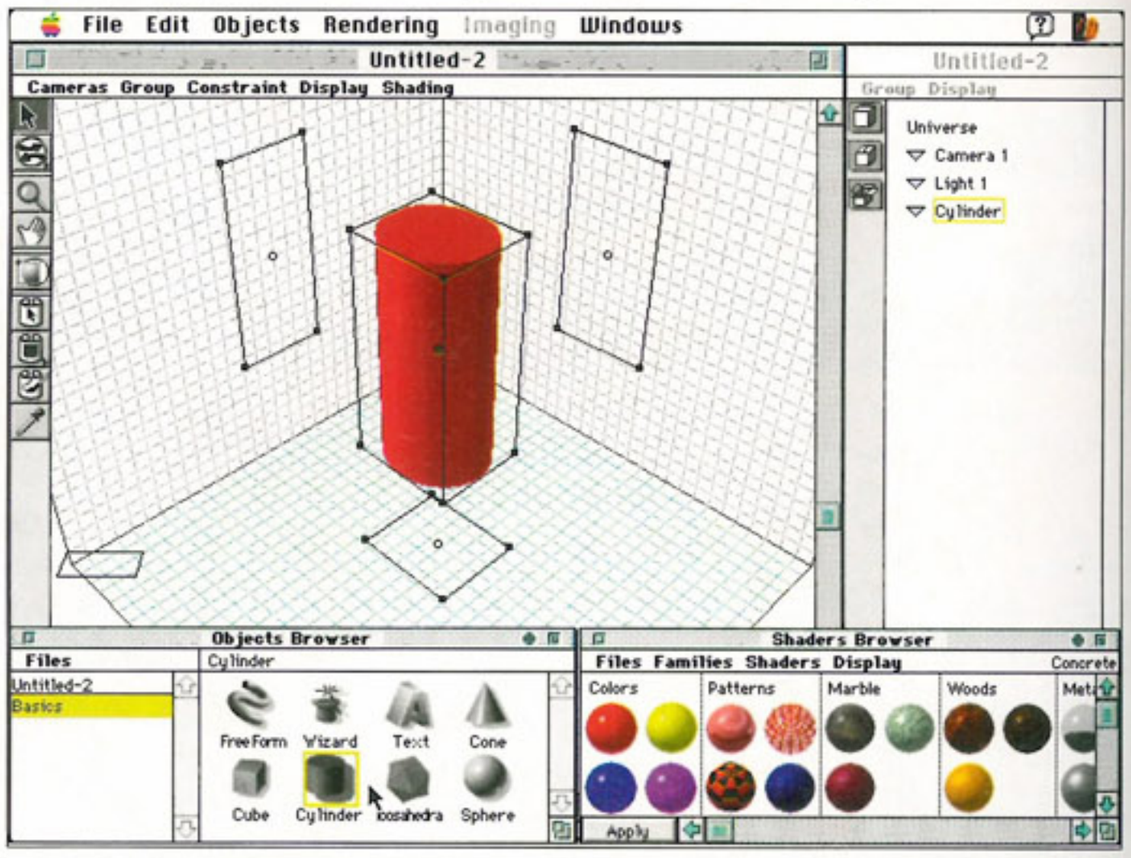
The first rule of Mac law states that the minute you get kitted out with more power and memory than you will *ever* need, some clever-dick developer will invent an essential, new wonder-tool that slows the 'brain' of your hot new Mac to the speed of an ageing Mac Plus doused in syrup. The culprit, this time, is Ray Dream with the latest incarnation of its much praised 3D package, *Designer*.

The tool at fault is 3D Paintbrush; this encourages you to paint directly on to 3D objects using any of the procedural shaders: woodgrain, marble, even reflective bump maps! On a Quadra 650 though, even the tiniest brush is slower than a 6-inch airbrush in *Photoshop*. But if all this sounds like negative criticism – think again. This is the most enjoyable 3D package I've ever used – one which has kept me up later than any game ever could. Worth investigating further? You betcha!

The biggest problem facing designers of 3D modelling systems is how to create three-dimensional worlds on two-dimensional screens – a task made even harder because the hand tools, like mice, only work in two dimensions. The most popular techniques are the tri-view (the infamous 'front elevation, end elevation and plan' from tech drawing classes) and the isometric or three-quarter perspective view.

While designing its interface, however, Ray Dream took the revolutionary step of combining these two methods together, to produce a beautifully simple 3D perspective workspace.

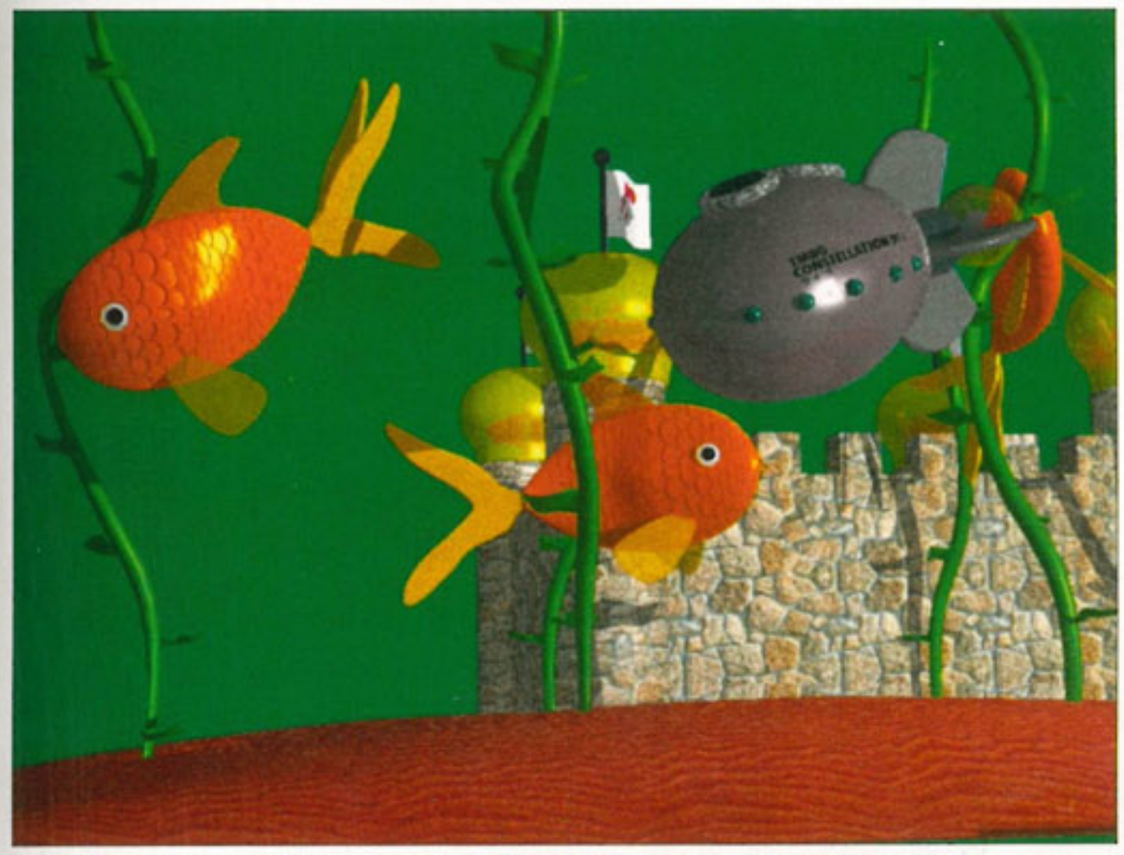
The rest of the main-workspace interface is fairly conventional – although each window



Once you're in Ray Dream's innovative perspective workspace, you can drag simple objects on to the main window from the Object Browser. You can then grab them with the pointer and move, size or rotate them (or at least their bounding box) in real time. In addition, you can also have three plane views, each showing the precise position of the object in space, by displaying its profile – almost like a shadow projected from front, side or top. This is especially useful for 3D novices, because it makes scene creation fairly easy. (Nothing to do with computer 3D is *totally* easy!)

3D BASICS

3D computer graphics is based on the idea of creating a virtual 3D world then capturing a high resolution image of it. It involves constructing objects using a variety of tools; giving them realistic surface qualities like reflection, texture, colour etc; then placing them together in a 'scene', complete with lights and cameras; and finally rendering them. The whole process is comparable to a photographer setting up a still-life, then lighting and photographing it.



If I didn't know better, I'd say we'd warped into a goldfish bowl... Silly me, eh?

Anti-aliasing and oversampling

All computer painted or rendered images are actually composed of a fine patchwork of tiny squares called pixels. A diagonal line or edge can therefore look stepped or jagged. The process of removing this stepped effect and smoothing the line is called anti-aliasing. There are two main anti-aliasing methods – Over-sampling and Areasampling. Areasampling is the more common method. This is where the area around the step is examined and the colour of pixels at the step is changed to an average tone to disguise it. This can be carried out after rendering, but it causes edges to look blurred. The more accurate approach is to render detailed areas of the scene at a much higher resolution than required for display (or 'over-sample' them). Then, when the image is displayed at the chosen resolution, imperfections can be averaged out accurately, because there is more data to work from.

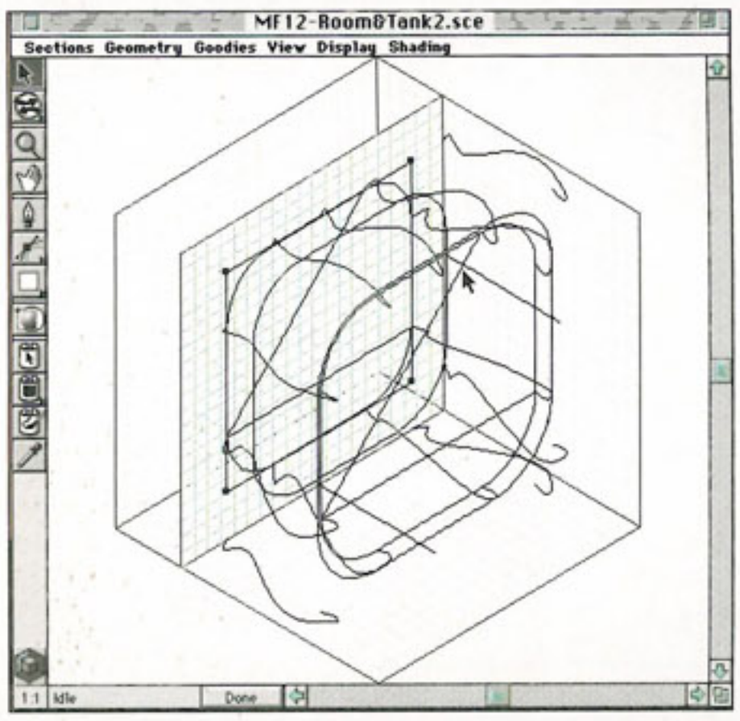
Without anti-aliasing

With anti-aliasing

does have its own menu bar in addition to the main one. While the main menu commands relate to the program functions as a whole, the window menus (like the window icons) relate specifically to the functions of that window. This may sound complex, but the system is really very friendly.

In addition to the main perspective window, there's also a Hierarchy Window, an Objects Browser and a Shaders Browser. These are normally left displayed, while the Shader Editor, Camera Settings, Alignment and Numerical windows are opened as required.

The Objects and Shaders Browsers use a 'drag-and-drop' system enabling you to quickly drag objects into the workspace and then immediately shade them. Dragging a free-form object over the workspace jumps you into the Object Modeller mode. The workspace for Free Form Modelling has a similar perspective to the main window, except it includes a cross-section along one plane and extrusion paths on the other two for 'extrusion' type processes. In practice, modelling is similar to the process used by MacroMedia's *Swivel 3D*: a cross-section and two profiles. Here, however, you have the power to add extra cross-sections, and then twist them to make spiral objects, or even make holes through them (compound objects). It also



Dragging a free-form object from the Browser automatically takes you into the Free Form Modelling editor. This uses a perspective workspace similar to the main window. For 'extrusion' type processes, it has a cross-section on one plane and extrusion paths on the other two. It uses bézier-curves for all modelling actions to ensure the objects have smooth organic profiles. Complex organic shapes can be further modelled using a Scaling Envelope. This places extra curves on either side of the extrusion paths, giving you much more control over the profile of the object. Here you can see the fish-bowl, which was modelled using a Scaling Envelope (the two curving lines on each grey grid).

uses bézier-curves for all modelling actions, which ensures the objects have a smooth organic profile. Complex organic shapes can also be modelled using a Scaling Envelope.

Dragging a Text Object over the main workspace takes you to the Text Editor mode, where your text can be typed in and parameters, like depth and bevel type, can be determined. The Text Objects are then placed within the workspace.

To make object construction easier for the novice user, Ray Dream has provided a picture-based 'assistant' or Wizard. This leads you through the object construction process with simple multiple choice options and boxes which you can click on.

Once the physical form of an object has been modelled, it must be given material qualities such as colour, reflectiveness, transparency, texture etc. These can be applied to objects by dragging a Shader from the Browser. If none of the provided Shaders are suitable, you can create new ones in the Shader Editor with combinations of Procedural Shaders and Texture Maps. As well as dragging Shaders to an object, you can also 'paint' them on to the surface using several 'paint' type tools: polygon shapes, paintbrush, airbrush and eraser. Not suprisingly, this process can be slow, but it is manage-

JARGON BUSTERS

Bézier-curves: smoothly curving lines whose degree of bending is controlled by handles at either end. This is exactly the same as the curve tools in *FreeHand* and *Illustrator*.

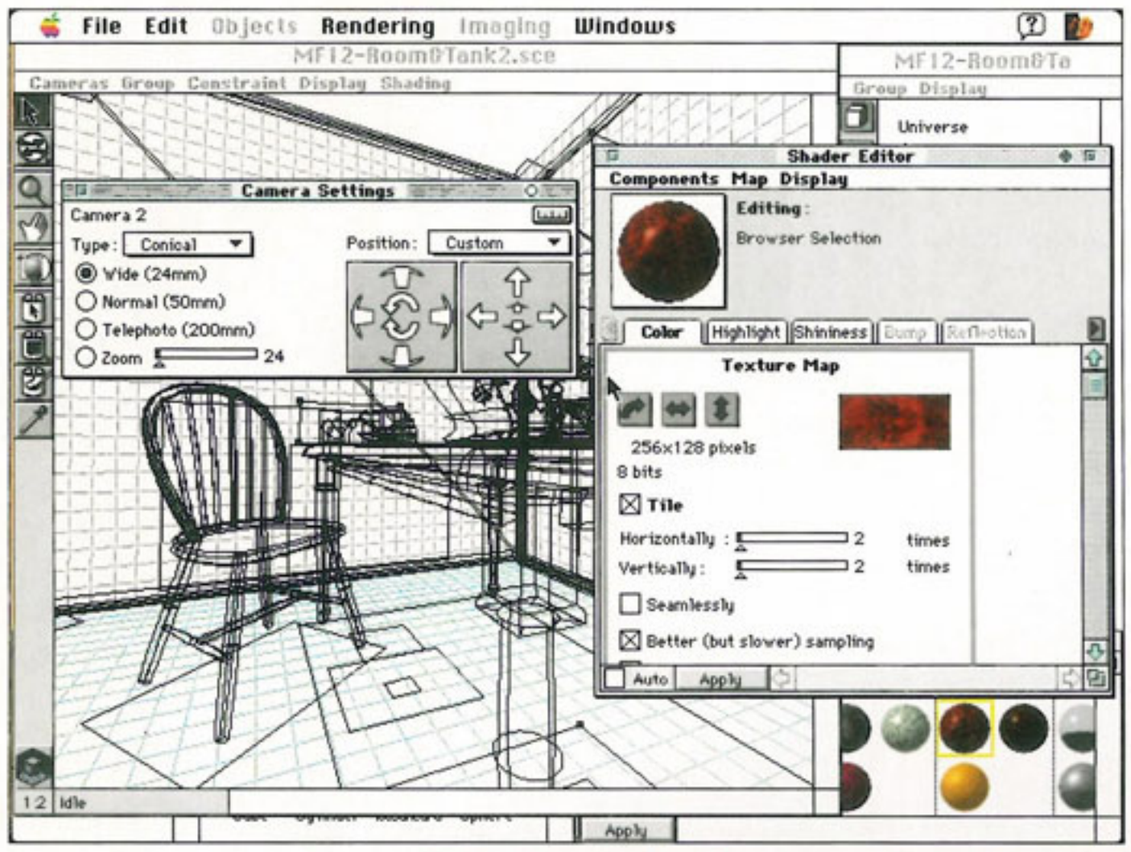
Bounding box: some complex objects are too large to select and move in real time, in which case, a rectangular, 3D wireframe box, just large enough to contain the objects, is constructed around them. This box is then transformed as required in real time, before the object is re-drawn in the new position.

Extrusion: one of the simplest ways of making a 3D object. Extrusion is what happens to the toothpaste when you squeeze the tube. In *Ray Dream Designer* – and most other 3D programs – you first design the shape of the 'hole' as a two-dimensional profile or outline, then push that shape out in one direction.

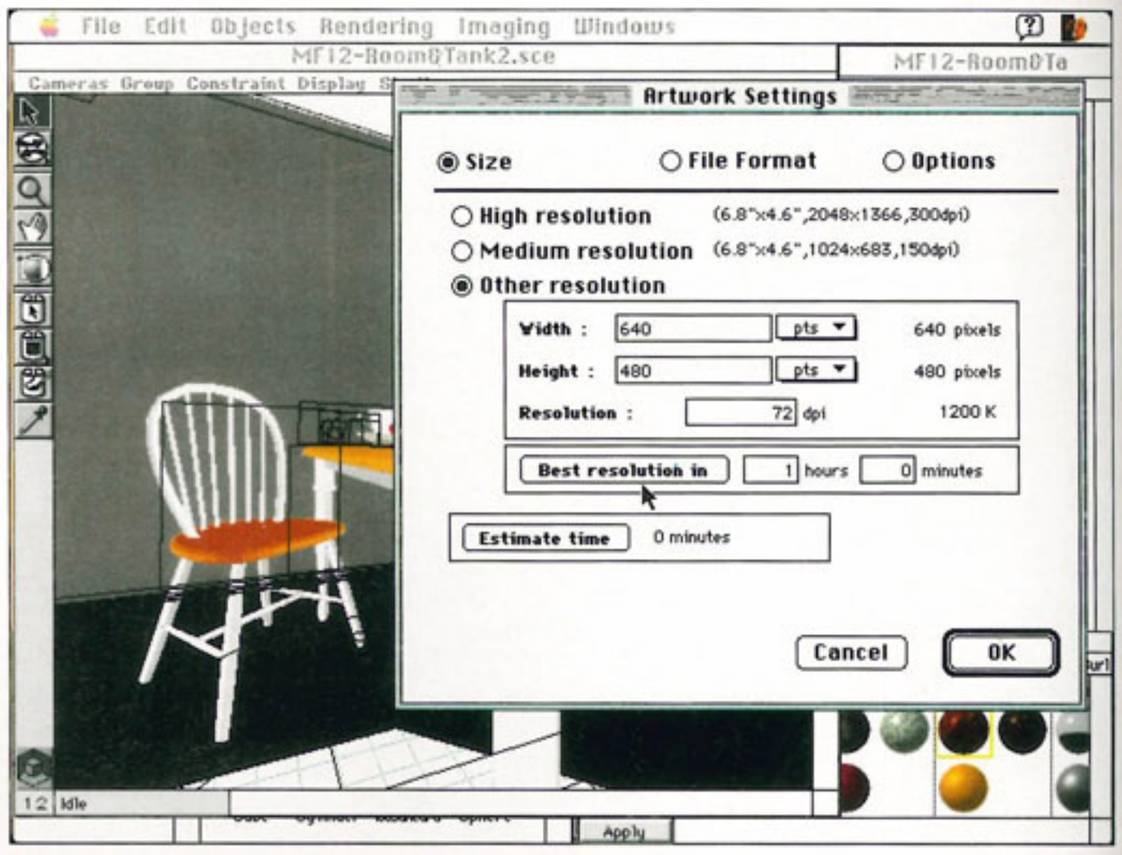
Ray-tracing: each light ray is traced from its source, through the model – noting the properties of the objects it bounces off or passes through – to the 'camera'. Every pixel is then coloured according to the accumulated 'experiences' of its ray.

Shaders: all objects in the real world have material qualities such as colour, reflectiveness, transparency, texture etc. These can be simulated on modelled objects in two basic ways. Procedural Shaders use mathematical methods to imitate the natural properties and textures. Texture Maps, on the other hand, produce these effects by wrapping painted or scanned bitmaps around the objects' surfaces.

Soft tools: the great advantage with computer modelling is that you are able to change your mind and alter the shape of objects at the last minute. The latest systems offer the ability to push and pull a model directly, almost as though it was made of soft clay.



You can apply shades and textures by dragging a preview sphere from the Shaders Browser on to the object. If none of the provided Shaders are suitable, new ones can be created from combinations of Procedural Shaders and Texture Maps in the Shader Editor shown here. Camera type, position and lens angle can be controlled from the Camera Setting window.



Once you've finished messing around with all the parameters (hours and hours of fun to be had there, honest) and you finally set them, rendering is simply a matter of setting the size of the final image, its file format and the type of channels saved with it (up to 12 different channels can be saved).

able and makes applying bits of texture, lettering, splashes of colour and dirty bits *[Steady on – Ed]* so easy.

Unusually for a 3D program, there's not much to say about setting and rendering the scene. All objects, lights and cameras are displayed within the workspace in the same easy-to-manipulate way, so it's simple to construct your world. (As always though, tweaking it to your satisfaction takes hours. Shame there isn't a 'Nice-Looking Arrangement' Wizard!) A simple rectangle can be displayed on screen as an accurate Production Frame. This will indicate the shape and size of the final render. There are lots of tools to automate orientation and alignment, and you can also set up several cameras in various positions, so trying out different views of the scene is easy. Lights and cameras have a number of the usual variables, but they don't include soft-edged shadows, depth-of-field effects or motion blur.

In addition to the normal workspace display modes of Bounding Box, Wireframe Preview and Better Preview, there are two full ray-tracing rendering modes – a low resolution 'preview' tracer and a high resolution Artwork tracer. Once you have set the background colour or bitmap and the 'atmosphere' (haze level), the ray-trace can be set in motion. Detailed speed comparisons are a waste of time, but the 'render engine' is certainly pretty quick, and the quality of the final rendered image is excellent. Like *StrataVision* and other sophisticated renderers, *Ray Dream Designer* uses 'adaptive oversampling' as an edge-smoothing technique. This works best with high resolution renders. If you still need conventional anti-aliasing, however, this must be carried out – again, as in *StrataVision* – as a post-production task. Ray Dream has a very effective anti-aliasing application: *JAG II*. This must be purchased separately, however.

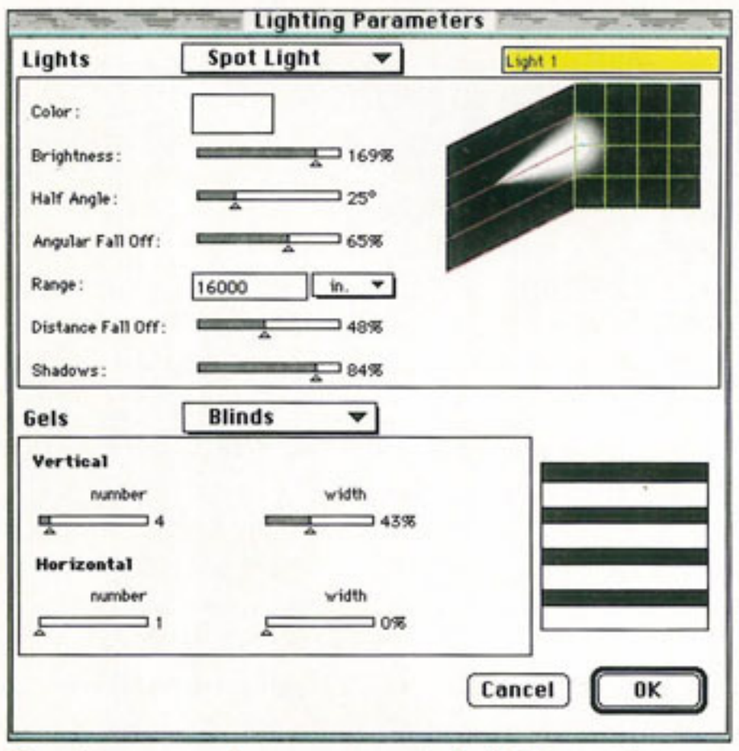
As *Ray Dream Designer* is primarily intended to be an illustration tool, the level of post-production support is understandably high. Rendered images can be produced with numerous extra channels, which enables *Photoshop* or other image processing systems to use RGB colours; masks; distance effects, like depth-of-field; individual object selection; 3D surface-mapping etc. Most of the *Photoshop* plug-ins can be accessed from within the program.

The only functions that *Designer* hasn't got are soft shadows, motion blur, and depth-of-field, but these can be added in post-production, if need be. The Modelling mode could really use more 'soft' tools, and the procedural 'atmospheres' are limited. Animation's not generally an issue with illustration programs, but you can add plug-ins and extensions to *Designer* to provide extra tools later.

At this price, there really is no competition to *Ray Dream Designer*. Strata's *StrataVision*, Specular's *InfiniD* and *Alias Sketch* have similar features and power (though *InfiniD* and *StrataVision* can also cope with animation), but they cost twice as much.

Having got so far with its idea of a perspective workspace, Ray Dream spoilt the earlier versions of *Designer* by dividing the modelling and rendering functions into 'modules', which virtually acted as separate applications. There's no trace of that sort of nonsense here. The various parts of the design process are smoothly integrated into an excellent package which is ideal for producing 3D illustrations – and having fun!

Brian Larkman



Once the scene and cameras are set, the lights must be positioned. Each light can have a large range of individual characteristics controlled in the Lighting Parameters window.

THE COMPETITION

For other 3D-modelling packages on the Mac, check out:

- *Macromedia Swivel-3D* Pro costs £599. For more details contact Computers Unlimited 081 200 8282
- Strata's *StrataVision* costs £680. For more details contact Gomark 071 731 7930
- *Alias Sketch* costs £699. For more details contact Gomark 071 731 7930
- Specular's *InfiniD* costs £799. For more details contact Gomark 071 731 7930

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Riding the *Helix Express*

Looking for a database with colour, advanced graphics tools and a stylish interface? Well, this isn't it, but *Helix Express* still attracts a strong following.

There's something about database software that inspires almost fanatical loyalty. People who have no strong feelings about their word processor or backup utility become as committed as football fans when the subject turns to databases. And no database program arouses as much loyalty among its fans as *Helix Express*.

It's an oddball product that you may love or loathe, but at least you can never accuse it of being ordinary. *Helix* is completely unlike any other database; it lacks what others take for granted, and does things that others don't aspire to do. What makes it important, though, is that if you do take to it, it can provide an alternative and accessible way into the rarefied world of relational multi-user databases.

So, what's it like? Well, the extraordinary thing is how little the core program has changed – some new features have been added and some bugs removed, but, in all this time, there's never been a face-lift. And, boy, could *Helix* have done with one.

The fact is, *Helix* is not a shining example of interface design; it spurns aesthetics with all the zeal of a puritan fundamentalist. The whole interface is resolutely black-and-white, with no graphical tools other than a simple rectangle. And don't imagine that you'll be able to change the line width of the rectangle, fill it with a pattern or give it rounded corners. That would be far too frivolous. There is no way to draw a line or circle in *Helix Express*, no setting of pen patterns and no grouping of objects. You can create plain fields, labels, buttons or rectangles in your screen layouts – and that's it.

Never judge a book...

But, behind the spartan exterior, this is as powerful and versatile a program as many of its more stylish competitors. It provides full relational links, enabling you to combine data from separate data files; offers good security and access control; and provides proper multi-user operation over a network. With custom menus and on-screen buttons, it's possible to build sophisticated professional databases, in spite of the design limitations. It is also the only mainstream database program that enables you to store whole documents (or BLOBs) as field contents – see MACFORMAT 4, September 1993.

Setting up a *Helix* database, or Collection as it's known in *Helix*-speak, begins with the usual steps of defining fields and designing layouts. But, before you can enter or access the data, you also need to define one or more 'views'. A view is made up of a template (layout) with the optional addition of an index, query or calculation formula. Unlike some other programs, *Helix* doesn't attach indexes directly to fields or files; instead you create them as separate entities. Similarly, queries are defined separately. This system is quite flexible, but slightly better suited to handling a repertoire of pre-established data operations, rather than to ad hoc searches and views.

The other quirk that characterises *Helix* is its religious belief in icons. When you create a form layout, the names that identify the field rectangles are in the form of icons. No matter that a name is all you need, or that the icon can inadvertently, but very easily, be positioned so that its label is unreadable. This is a matter of ideology, not convenience.

One area where database programs vary markedly is in how they tackle calculations. Some, such as *FileMaker*, attach formulas to

WHAT'S NEW IN VERSION 2?

[Command]-Q: *Helix* has finally acknowledged that [command-Q] is the Mac standard equivalent for the Quit command.

Keyword fields: these enable you to set up text fields, which you can then search for any word.

Multi-column reports: listing reports can now be printed in multi-column format, with the record order moving horizontally or vertically.

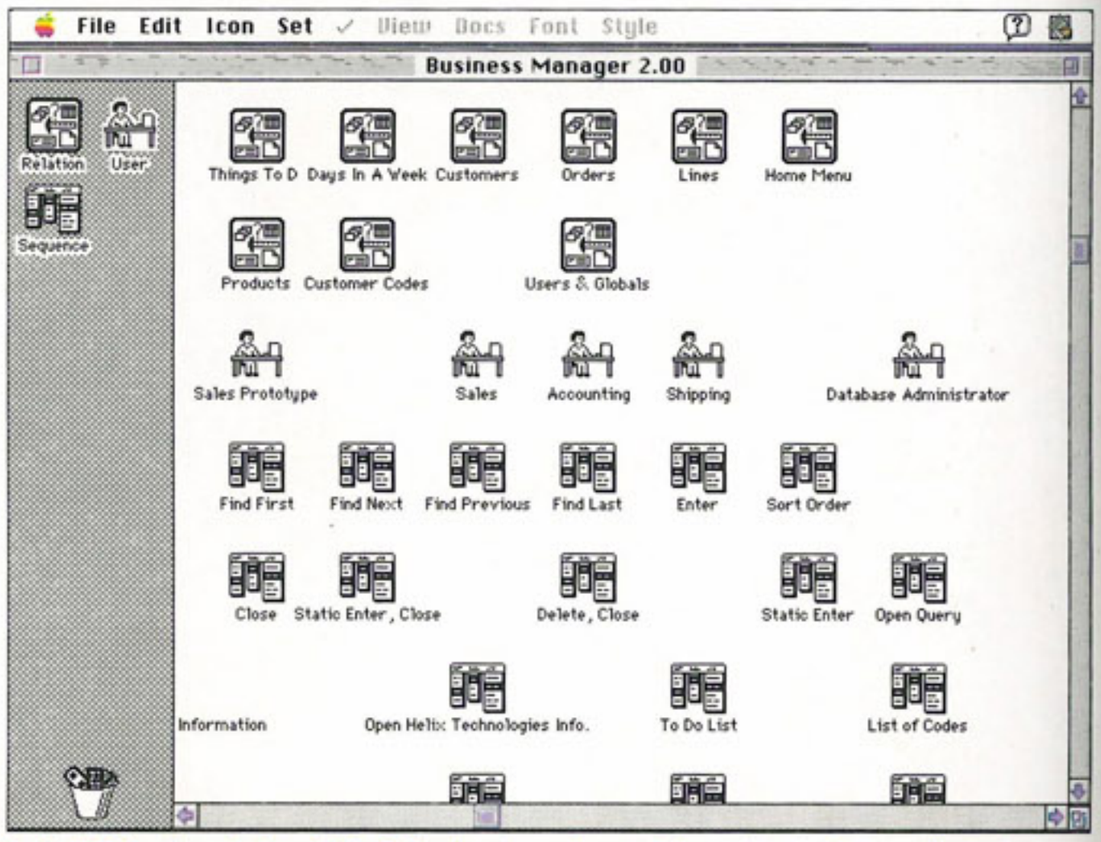
Re-sizeable pop-ups: dynamic pop-up menus for data entry can now re-size automatically to suit the items they contain.

Publish and Subscribe: not vastly important for most users, but it helps to bring *Helix* into the age of System 7.

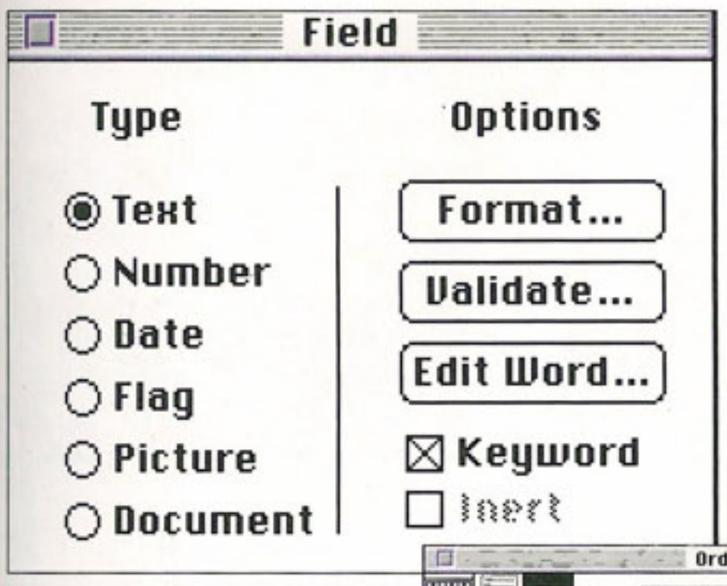
Scrollable Fields: yes, *Helix* now has scrolling fields.

Speed Improvements: various changes have been made to improve performance, especially when searching.

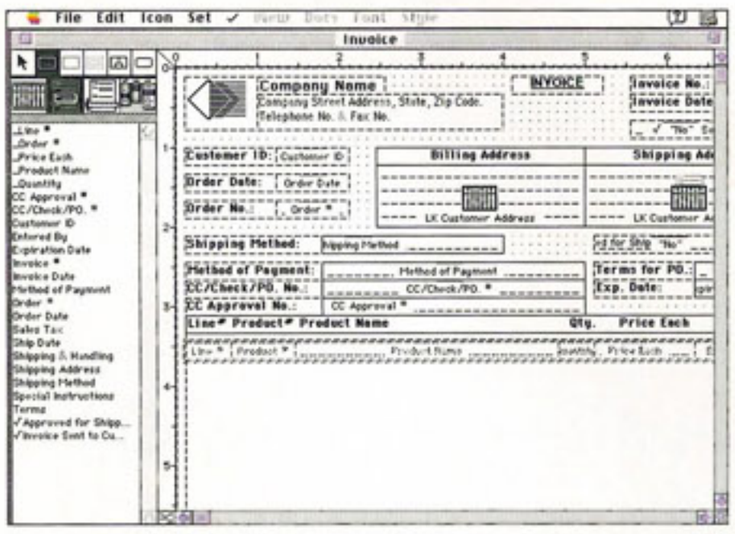
User-selectable lists: multiple records can now be selected in listing forms by using [shift]-click and [command]-click.



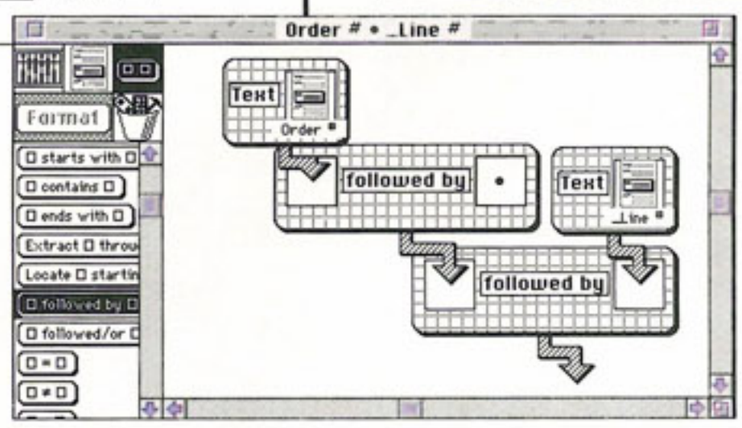
A *Helix* Collection window. This Collection is made up of nine related relations (files) plus access privileges for several users. The sequence icons represent macros (sequences of pre-programmed commands).



Helix supports the usual range of data types, plus a Document type, used for storing BLOBs within database fields. Note the **Keyword** option – one of the new additions in version 2.0.



The template layout window. You can paste graphics, such as the logo, into a template, but you can't create any graphics other than a plain rectangle. On this particular form, the lower part is taken up with a sub-form that lists data from a related file.



Creating an Abacus. These tiles achieve a simple text manipulation, concatenating two fields with a bullet in between. Tiles are selected from the list shown on the left and dragged into place. You can also see a list of fields or other Abacuses.

fields; others, like *4th Dimension*, behave more like a programming language, enabling you to create variables that will hold calculation results. *Helix Express* comes closer to the latter approach, but, as you might expect, it does so in a completely original way.

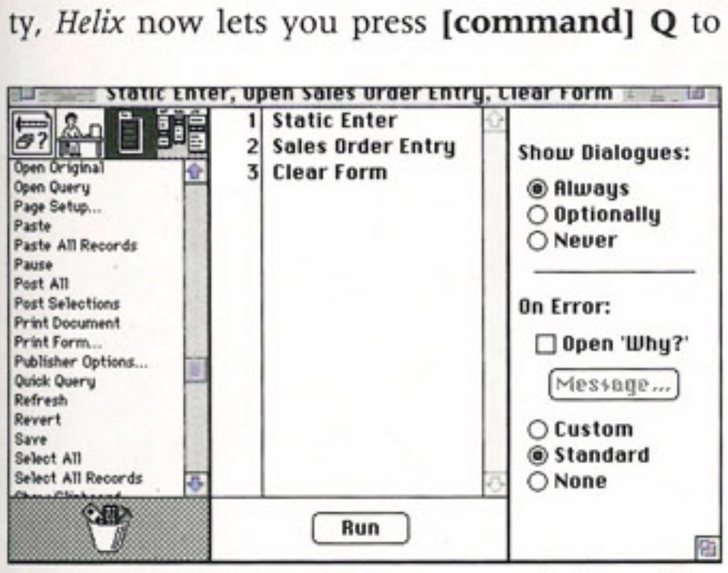
Any calculation (or Abacus, in *Helix* terminology) is constructed by arranging tiles and icons into a logical structure. Each tile represents one of the built-in functions or operators of the programming language, and contains one or more 'black holes' to hold the arguments (or values) that it will work on. By dragging field icons or other Abacus icons into these 'black holes', or by directing the output of other tiles into them, you can build up formulas, which can be as simple or as complex as you need them to be. For many users, this graphical programming is one of *Helix's* strongest points, while others find it a confusing jumble. Your best bet then is to try it out for yourself. If you've struggled with the conventional approach, this may be a breath of fresh air. If not, it's best to find out before you buy it.

With any other product, the move from version 1 to version 2 would imply quite a significant development; here it's more a subtle evolution. Performance has received a boost, support for Publish and Subscribe has belatedly been added and, in a move of radical conformity, *Helix* now lets you press **[command] Q** to quit! Pop-up menus for data entry can now automatically resize to suit the maximum item size. More importantly, you can now **[shift]-click** and **[command]-click** to select multiple records within a listing form.

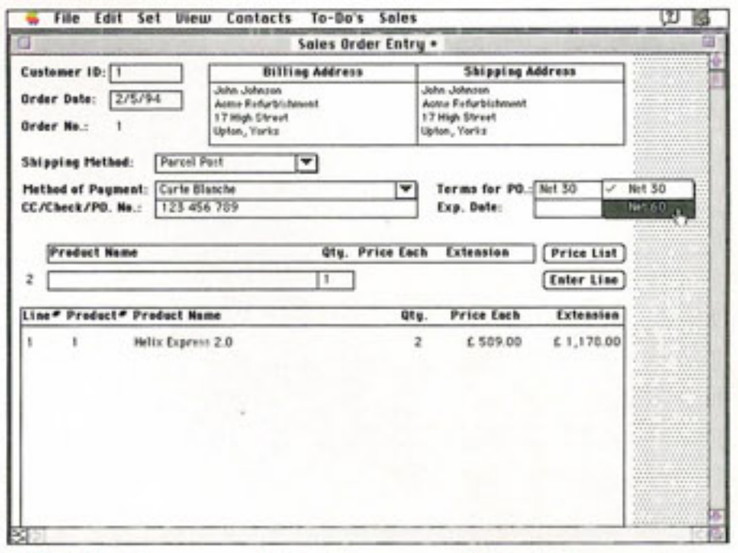
A more significant addition is the introduction of Keyword fields. Previously, you couldn't search text fields for individual words; now, by selecting the **Keyword** option, you can. The other big improvement is that fields can now scroll. Sadly though, one of *Helix's* biggest shortcomings still hasn't been put right. Like most relational programs, *Helix* enables you to list data from related files within a form, but, unlike other programs, it can't scroll the list, so you'll only see as many records as you've made room for. This really is a limitation, and one that can't be excused by appeals to non-conformity.

Helix is a very powerful program; its abilities for posting data between records, its handling of relations and its graphical programming language are significant features. Its quirky character may not suit everyone, but then, diversity is what consumer choice is all about. Nevertheless, *Helix* could address some of its limitations without having to sacrifice its unique character. If it did, it might attract new users to what is one of the most original and interesting of all Mac database programs.

Jack Weber



Like most things in *Helix*, defining a sequence is done with minimal typing. You drag items from the list on the left and build up the actions in order. Sequences can include other sequences, so you can re-use some basic building blocks.



A finished form, complete with pop-up lists, buttons and custom menus. Despite its graphical simplicity, this invoice form includes many advanced features on a par with those in other top-end programs.

JARGON BUSTERS

Abacus: a formula that defines a calculation or other operation. An Abacus has to be programmed by linking tiles that represent the various commands and functions of *Helix's* programming language.

BLOB: Binary Large OBject. This is a file type that enables you to store and launch any sort of document (text, graphics or whatever) from a database field. This means that *Helix* can be used for document management tasks – something that no other conventional database can handle.

Collection: a *Helix* database, made up of one or more data files plus all their layouts, indexes and so on.

Posting: a link that can be set up in *Helix* to edit or create a record other than the one that's currently being worked on. The other record may be in the same relation or in a different one; this is useful if you want a single action to update several records. It's a powerful technique, though potentially dangerous if mishandled.

Relation: this is the name for an individual data file. Usually, the relations within a Collection will be related, but they don't have to be.

Relational: a database that incorporates several separate data files which are linked (related) to each other. This prevents duplication of entries and makes updating easy. For example, in a database of staff records, many employees will share the same personnel officer. Set up related files for Employees and Personnel, and you can simply link each employee to the appropriate record in the other file.

HELIX EXPRESS 2.0

Price: £420.
Requires: Mac plus or better, System 6 or later, 2Mb of RAM and hard disk.
For more details contact Computer Capability on 0392 364253.

Ease of use — 85%
It doesn't suit everyone, but many people swear by it.

Documentation — 83%
Good, thorough, if rather wordy, loose-leaf manual.

Features — 76%
Some powerful features, but urgently needs updating.

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MACFORMAT RATING — 79%

Crunching by numbers

As if there wasn't enough child abuse, the Mac now has a spreadsheet for kids!

What's this? A spreadsheet program which claims to be suitable even for ten year olds. Yep, that's right. *The Cruncher's* packaging proudly boasts that this is 'The spreadsheet that's fun and easy to use'. Don't be fooled though. You see, the program is described as being 'fun to use' not because it makes the intricacies of spreadsheets any easier to operate or understand, but because of its features.

One of the program's main features is the facility which enables you to stick pictures (many of which contain some level of animation) and associated sounds around your worksheets. At first, I was really taken with this, and spent quite some time experimenting with different sound and picture combinations. You can also play around with adding sounds and pictures of your own by using the Mac's built-in microphone and copying images from the Scrapbook.

Picture this

Then I realised two things: first, that I could customise the spreadsheet I normally use in this way, simply by copying pictures into the Scrapbook, then copying them on to my worksheet – something that hadn't occurred to me before. Second, while I was having fun playing with the appearance of the blank spreadsheet, I hadn't actually started using it.

So, feeling like a naughty boy, I dutifully started entering numbers in the columns and rows (vertical and horizontal lines of 'cells' or squares of the worksheet, which can contain either numbers or words). And I must say here that while the program might introduce elements of fun in terms of layout, it doesn't make structuring the worksheet itself any easier than 'adult' ones – with the exception, perhaps, of the 'format' command, which highlights the columns in different colours. This is a helpful feature not only for children, but also for adult users who want to emphasise particularly significant data.

Then there's the 'text-to-speech' feature. First you highlight a row, column or cell, then click on a button and your Mac reads the text. Except it doesn't 'read': the American-accented voice is expressionless and depressing. I must admit, I do get irritated with documentation that claims the program will 'read' what is written – if kids read like that, they'd be lucky to progress past Level 1 in the National Curriculum. No. Programs like this sound-out words – they don't read them. Still, work with 'speaking' word processors has shown that this type of facility can assist children with spelling and checking their work generally. So, providing they can put up with the 'voice' this could prove a useful feature.

The worksheet is capable of performing many of the things which you would expect in a more powerful program: you can create your own formulas to perform calculations and, although there are only six predefined functions available (sum, average, maximum, minimum, mode and median), you can type in more complex functions such as ABS, COS and TAN – providing you know what they mean, that is! There's also a notebook facility. This is a separate area which holds text relating to the spreadsheet – notes, explanations and so on.

Having created a worksheet with some data, you can then try the **Chart** command. This enables you to display numerical information in a number of graphical ways – pie charts, bar graphs, line graphs and scatter charts. Being able to represent numerical data like this is crucial to a child's learning, and having a graphical representation of data makes analysis that much easier and helps a child to understand the relationships between data.

Considering the way *The Cruncher* enables you to customise the worksheets, there is surprisingly little that can be changed about the appearance of the graphs and charts; it's possible to re-size the charts themselves, but the lines' or bars' colours, font and label size are all fixed. Perhaps that's the price of making the chart creation process so straightforward.

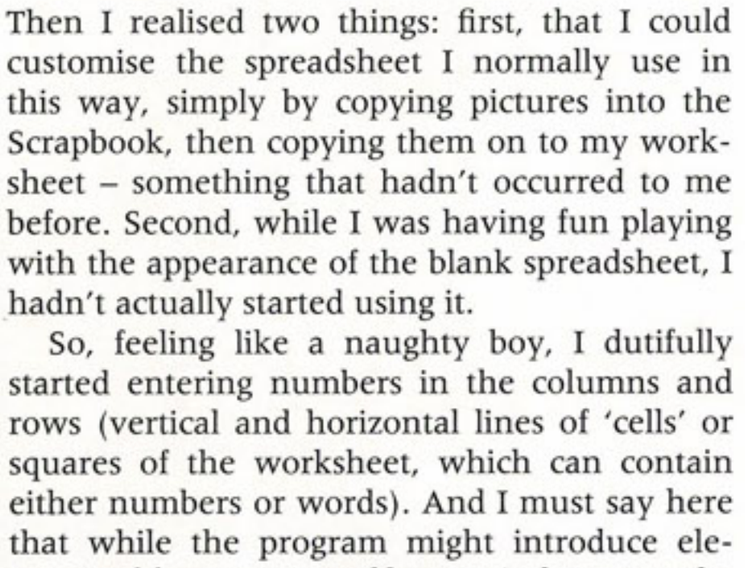
JARGON BUSTERS

Formulas: these are put in certain cells to perform the calculations; they identify the cells to be calculated and what should be done to them (for example, A3+C7, G25/B3). The result of the sum will be shown in the cell rather than the formula.

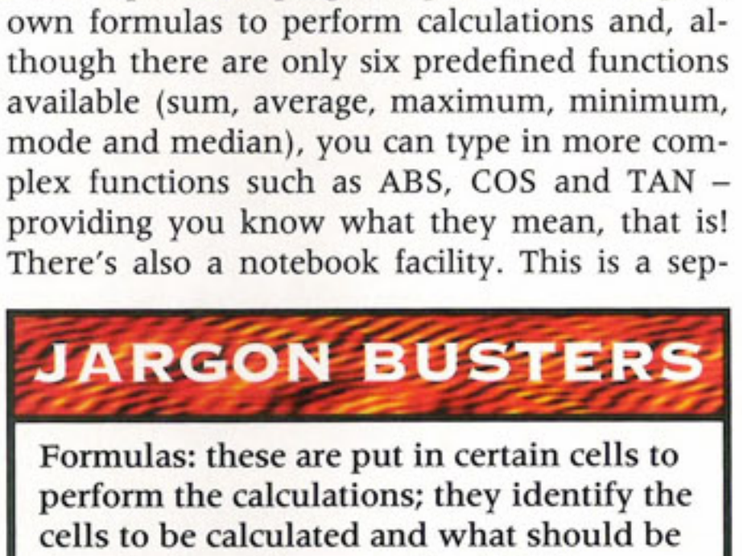
Chart of the matter

A more serious shortcoming in the program, at least as far as its educational potential is concerned, is the fact that it's impossible to chart two sets of data unless they are in adjacent columns or rows. Where the data is only in two rows, this is not a problem – but when there are several rows or columns of data, children need to be able to plot any row or column against any other row or column. For example, if a child is collecting weather data from a number of sites (say, from shipping forecasts and newspapers or via electronic mail) for a Geography project, they'll need to analyse the patterns and differences of weather in a variety of different places by charting data from two or more sites. Structuring a worksheet which enables them to do this easily is virtually impossible with *The Cruncher*.

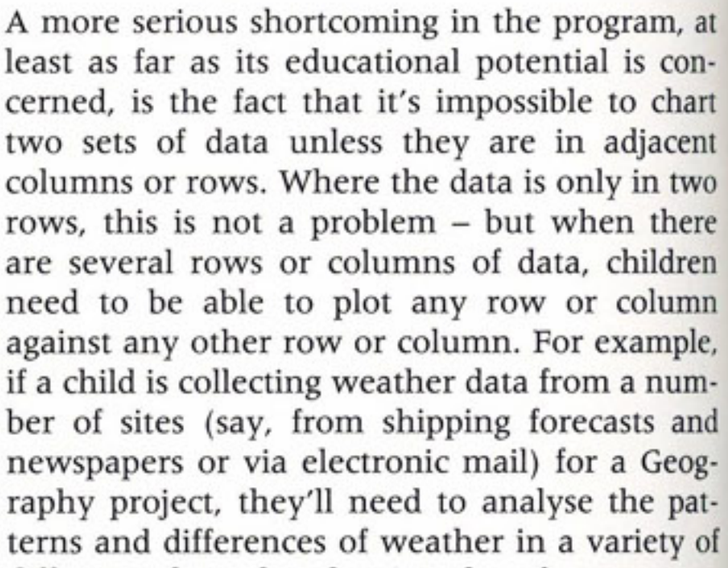
Charting Jordan's success



1 *The Cruncher* tries to encourage kids with these 'real-life' projects. Here we can see Michael Jordan's dunking record. It looks like he scores a lot, but is he the best?

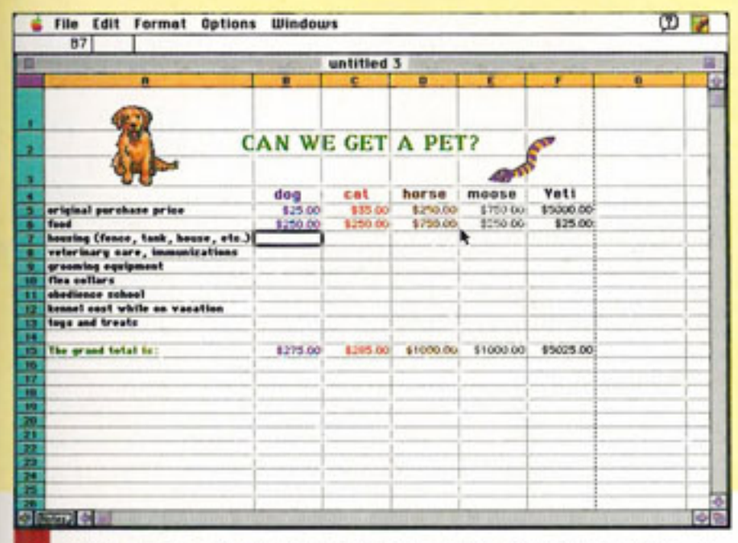


2 To find out, you simply select the appropriate cells, pull down the **Options** menu and select **Chart**. Now you can decide how to display the information…



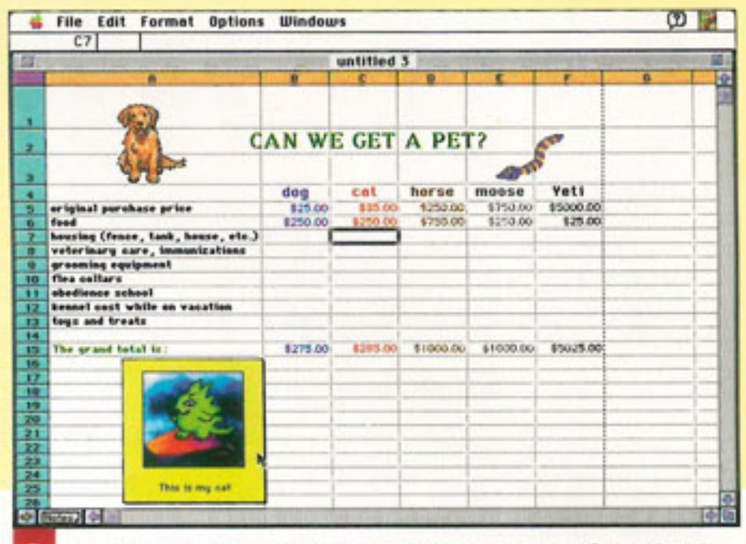
3 In this case, I've chosen to compare the players' performances via a simple line graph. Yep, just as I thought, I've left Mr 'big shot' Jordan eating dust.

STICK 'EM UP!



1 This is one of *The Cruncher's* customisable projects. I can liven this worksheet up with a picture and sound...

2 ... In order to do this, I need to choose **Sticker Picker** under the **Options** menu and select a picture and sound.



3 Or, I could paste in my own piccies via the Scrapbook, or record a new sound. There, that's better!

This is not the only flaw in the program, though. As with many programs which are imported directly from the US, *The Cruncher* hasn't been adapted for the UK market. The States not only has a different culture, but it also has a different approach to learning. For example, when you select the **Format** menu and format the numbers as 'currency', it automatically defaults to dollars. This is a severe limitation, especially given the importance of learning that numbers need an appropriate symbol to indicate context. The text-to-speech feature cannot 'read' the £ symbol either.

Another worry is the proposed age range of ten years and older. Children in the States might not be introduced to spreadsheets until the age of ten, but in the UK many ten year olds will have been using spreadsheets for some time at school. Simple spreadsheets, such as *Grass* and *Minnie* for the Acorn and RM computers, are well-established in many schools. These have basic charting facilities and, even though they don't have any 'flashy' features, they are used to very good effect by a great many teachers. By the age of ten, therefore, many kids are ready to move on to more complex spreadsheet programs with charting and analysis tools which *The Cruncher* doesn't have – like the facility to smooth curves in charts or to carry out complex statistical analyses.

The Cruncher would probably be appropriate for younger children (say, about eight year olds) who have already been introduced to a basic spreadsheet program but now need to move on to a spreadsheet which offers some of the facilities of more powerful programs, but without their complexities.

A colourful teacher

So, how good is this program at helping children move up to more advanced charting and analysis? Well, *The Cruncher* does contain a number of tutorials and projects. The tutorials start with a demonstration of the basics of a spreadsheet (how the cells can be used to add things up) before progressing to formulas and other more complex operations. They include colourful animation and as a basic introduction to spreadsheets they are quite good.

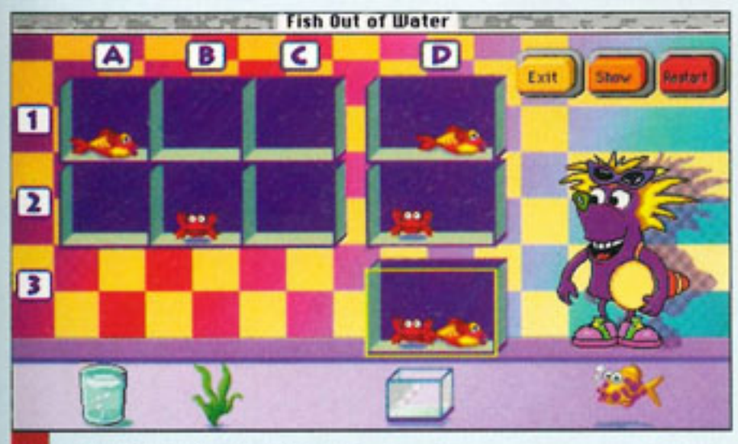
The package also includes various projects. These are partially-worked examples of spreadsheets, which children are then invited to customise for their own use. This is a great idea. Much of the initial slog of setting up a spreadsheet has already been done, leaving the child free to explore the way it's been structured and how the formulas work.

Unfortunately, the projects were designed for the American market and are of little or no use to the average UK kid. There are projects about baseball and basketball statistics, while others concentrate on the American youngster's 'mall' and 'yard work' (odd jobs around the house) and the amount of dollars he earns for his chores. It does seem a shame that these projects have not been adapted for a UK audience prior to *The Cruncher*'s release. It wouldn't have taken a great deal of time and it would have made the program far more useful to UK users. Ablac claims that new, more appropriate projects and tutorials are currently being developed and should be available in the near future. So, if you want *The Cruncher* specifically for teaching purposes, wait until the revised version's ready.

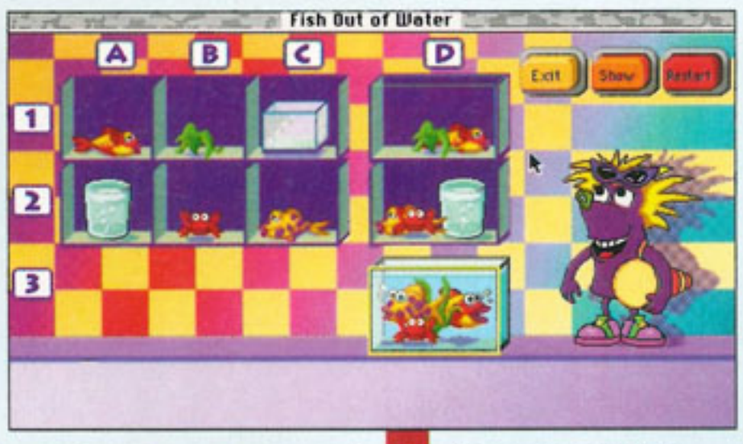
All in all then, this is a nice try. It doesn't have the facilities and flexibility of a program like *Excel*, but it costs a fraction of the price. It's a fully-functional spreadsheet program, and data can be exported as a text file to any other spreadsheet which accepts files in this format. If all you want is a program to help you with your household accounts and the like, this could well prove to be a cheaper option than the traditional dedicated programs. It's just a shame that it hasn't been properly converted for a UK audience.

Phil Moore

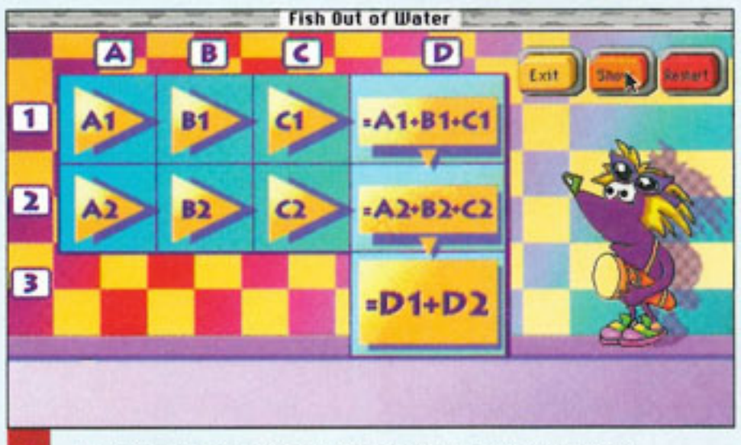
A SCHOOL OF FISH?



1 *The Cruncher* contains a number of colourful tutorials designed to explain the basics of spreadsheets to the young and curious. In this one, the program tells you to pick up the items from the bottom row and put them in a cell. When you move your fish, though, it dies. (It overacts, too!)



2 Once you put all the objects (the fish, the tank and the water) into the cells, *The Crucher* adds them together – and so, the fish come back to life!



3 Next it shows you the appropriate mathematical notation. I think I preferred the fish, personally.

THE CRUNCHER

Price: £44.95
For more details contact Ablac Computec on 0626 332233.

Ease of use Some fun, but it is a spreadsheet!	92%
Documentation Straightforward and readable.	90%
Features Sufficient for everyday use.	90%
Educational value Too American!	80%
MACFORMAT RATING	89%

The sounds of music

Jazz up your day with MACFORMAT's top ten fun sound and music programs, plus *Sound Trecker* – free with this month's cover disk.

You don't need tons of equipment to make music on your Mac. Even if you don't know your Middle C from the North Sea, you can record and edit sounds using the Mac's built-in recording facilities and play sophisticated sample-based songs through the Mac's speaker.

There are many low-cost or no-cost sound and music programs available to help you do just that. These programs will enable you, among other things, to play music files and edit sounds. The files are commonly called Modules or MOD files. These can store several minutes of music in a file which may be typically 100-300K long.

MOD files first made an appearance on the Commodore Amiga, but there are also MOD players for the Atari ST, Acorn Archimedes and the PC. There are thousands of MOD files available from Amiga and PC shareware libraries and bulletin boards. (We've included some on the cover disk to get you started.) As well as MOD files, you will discover thousands of WAV files. WAV is the name of the sample file format used by *Windows*; this is the equivalent of the Mac's SND files.

If you want to get hold of WAV files, check out PC shareware libaries and bulletin boards. Mac SND files are similarly available from Mac shareware libraries and bulletin boards. (We've included a few numbers in the 'Where to get sound files' box on page 84.)

You can copy WAV and MOD files from a PC disk to your Mac's hard drive using *Apple File Exchange* or the commercial programs *AccessPC* or *DOS Mounter*. The latter are much better and

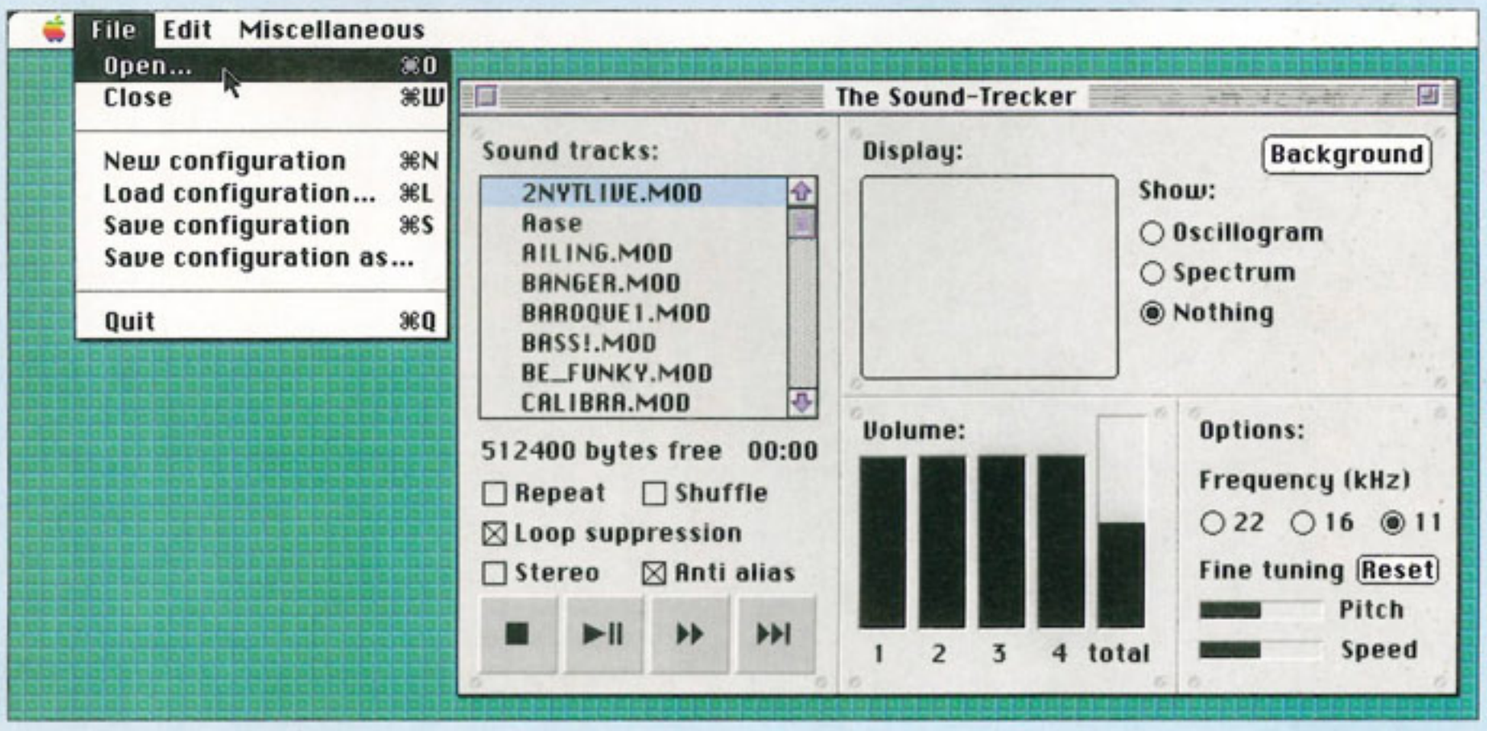
KEEP ON TRECKING

Making music can be a lot of fun, which is precisely why we've featured *Sound Trecker* on this month's MACFORMAT cover disk. *Sound Trecker* plays music files recorded in a special compact format which contains samples of instrument and vocal sounds plus note information. It will also load a PC MOD file, and will even ask if you want to convert it, so you can subsequently load it simply by double-clicking on it.

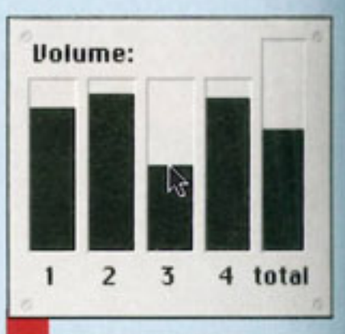
Trecker's controls work like a tape recorder and it's very easy to operate. The check boxes tend to be pretty self-explanatory – 'repeat' will continually cycle through all the songs in the track list, while 'shuffle' makes the songs play in a random order. Some MOD files don't have an ending as such, but run through an endless loop. **Loop Suppression** will fade out such a song and let the program move on to the next one. If your Mac supports stereo sound, select the **Stereo output** option.

This brings us to the **Anti alias** box, which lets you choose between two sampling conversion algorithms. If you don't check the box, a fast conversion routine is used which takes less processor time, but which may result in a little distortion. If you do check the box, however, *Sound Trecker* will use a better algorithm, but this requires a bit more processing power. The effect differs from file to file – let your ears be the judge. If you want to see how much processor time *Sound Trecker* is using, you can check the Measure Speed option in the Miscellaneous menu.

MAKING MUSIC WITH SOUND TRECKER



1 Use **Open** in the **File** menu to load lots of MOD files, then save the list using **Save configuration as...**



2 MOD music is constructed from four lines of music. Use the volume sliders to adjust the volume levels.

Samples of quality

Two main factors affect the quality of a sampled sound – the sampling rate or frequency, and the resolution.

The term 'sampling' refers to the thousands of sound measurements or samples which are made every second during a digital recording session. The higher the sample rate, the more accurate the digital recording will be.

Most recording devices on the Mac sample sound at around 22kHz (that's 22,000 samples per second). This produces reasonable quality, but it's nothing compared to that of CDs, which use a sample rate of 44.1kHz (that's 44,100 samples per second).

The sampling resolution refers to the accuracy or fineness of the measuring scale – normally 8 bits or 16 bits. 8-bit resolution means each sample can take one of 256 values. 16-bit resolution increases that range to a possible 65,536 values, which makes a 16-bit recording much more precise.

So now you know.

Jargon Busters

AIFF: Audio Interchange File Format. This is a standard file format for sounds, which will enable you to transfer sounds between different applications.

ResEdit: Resource Editor. This is a program which enables you to hack into programs and alter icons, sounds and so on. The cover disk on April's issue of MACFORMAT included a copy of *ResEdit* – along with an instruction booklet. (To order back issues see page 112.)

SND files: the Mac's 'standard' sound file format used for, among other things, system sounds such as the Beep.

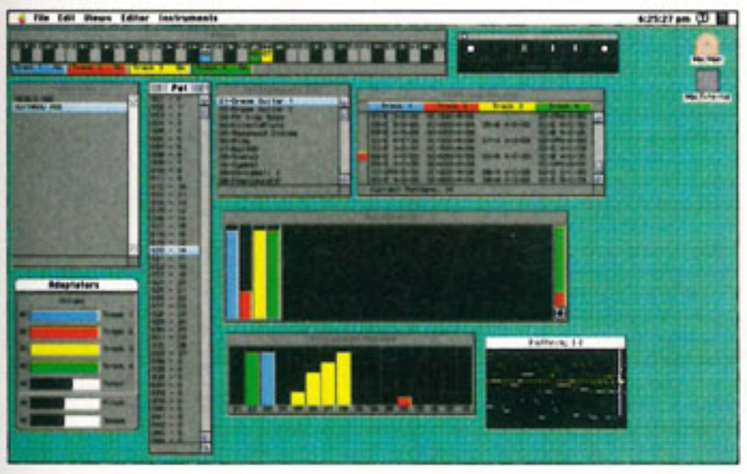
SoundEdit: recording software with MacroMind's MacRecorder digitiser.

well worth buying if you need to swap files regularly between a Mac and PC.

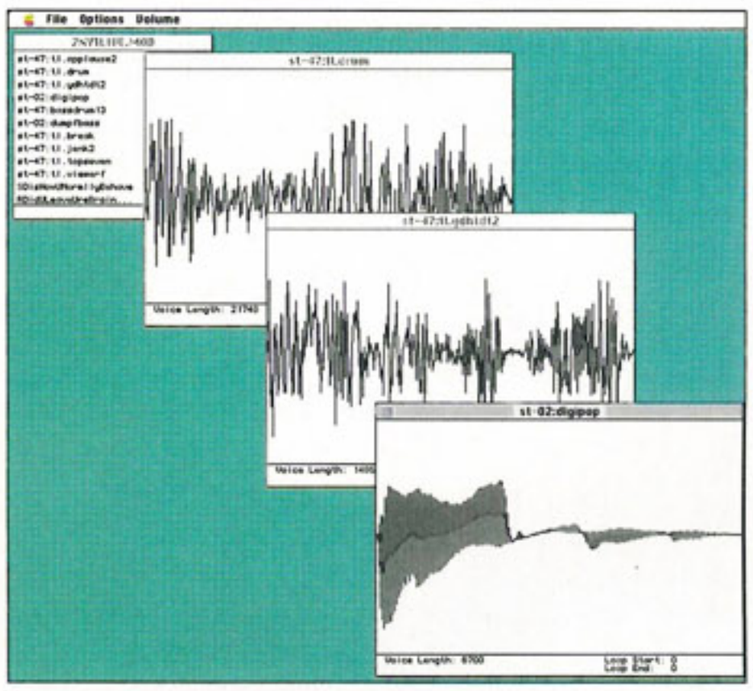
So, now you know how to get hold of files and how to install them, but what exactly's out there? What does it do? And is it any good? Read on and all will be revealed...

1. *Player Pro* is a shareware program which gives you more control over MOD files, but the unregistered version has some important features disabled. However, it does enable you to extract the samples used in MOD files and save them as SND files. It will also save a MOD file as a stand-alone program, which you simply double-click on to play. The full version enables you to export MOD files as MIDI files and import MIDI files.

2. *ModVoicer* will open a MOD file, show the samples it contains and enable you to play them via the Mac's keyboard. The pitch depends on the ASCII value of the key you press, which makes playing a tune rather difficult! You can save the sample as a *SoundEdit* file or a *ResEdit* resource file. If you enjoy hacking, *ResEdit* will enable you to paste the sound into another application.



Player Pro has lots of windows and lots of options and it enables you to do lots of things with MOD files.

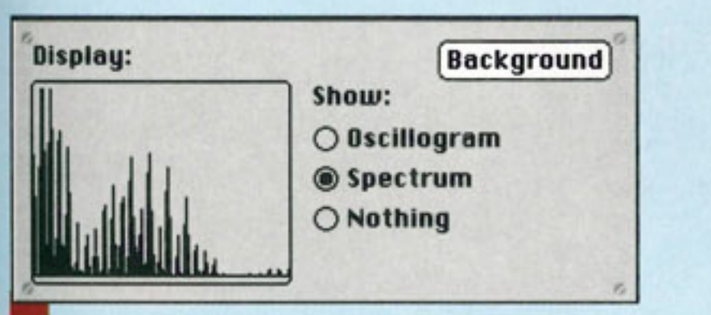


ModVoicer will extract the samples from MOD files and enable you to play them via the Mac's keyboard.

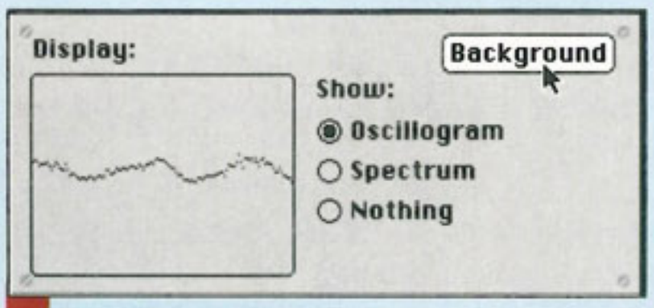
3. PC shareware libraries are a great source of music. They stock thousands of WAV files as well as MOD files. You can convert WAV files to SND files using *Balthazar* or the less exotically named *Brian's Sound Tool*. They both do exactly the same thing, except *Balthazar* enables you to hear the file, whereas *Brian's Sound Tool* enables you to convert a file by dragging it on to the program icon.

4. *Sound Hack* can load, save and convert files between *Sound Designer II*, AIFF, IRCAM, DSP *Designer* and NeXT/Sun workstation formats. You probably won't need all these formats, but *Hack* also offers some very interesting processing functions. The Binaural Filter, for instance, is able to create a stereo sound from a mono one, and place it in any position within the stereo image. Another feature is Convolution. This can take two sound files and process them together to create a sort of vocoder effect. You can also alter the pitch of a sample without changing its length (or vice versa) by using the Phase Vocoder. This is quite a complex operation which, in the mysterious world of hardware samplers and direct-to-disk recording systems, is known as Time Stretching. You can also alter the volume of a file and change the header information.

5. As the name suggests, *Sound Extractor* extracts sounds from sound suitcases. These were used to store sounds prior to System 7 and al-

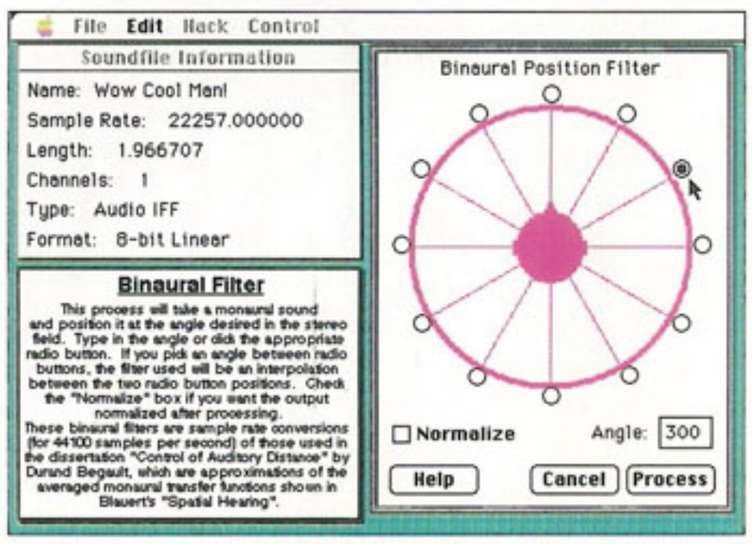


3 Select an Oscilloscope or Spectrum display of the music. Watch the display dance.



5 Send *Trecker* to the background and listen to the music as you use other applications.

4 You can alter the pitch and speed independently and adjust the playback frequency.



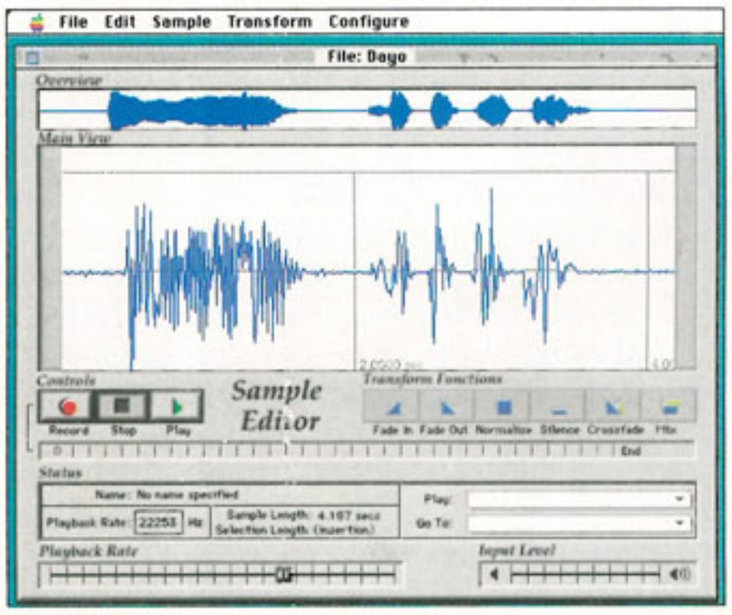
SoundHack's Binaural Filter will place a sound anywhere in the stereo field.

though they're still in use, most people use the System 7 sound format, which enables you to play a sound simply by clicking on it. So far, so useless (unless you have lots of sound suitcases lurking on your hard disk, that is), but *Sound Extractor* will also extract sounds from applications, stacks and other files – and that's very useful indeed.

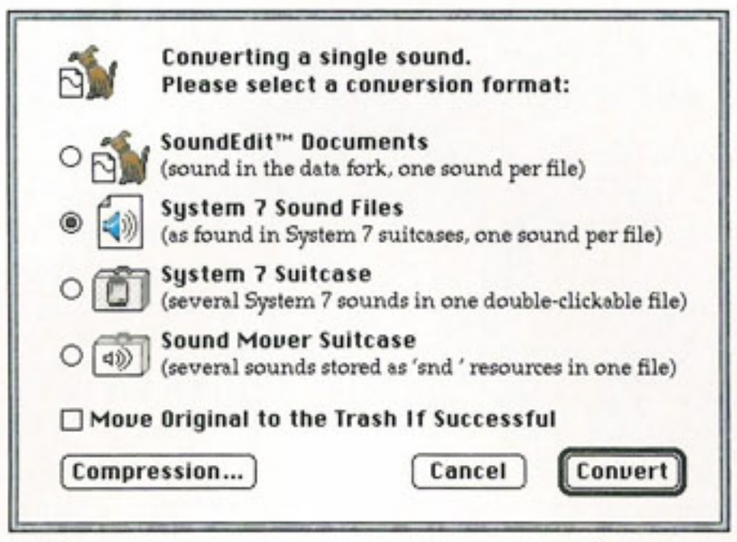
6. *SndConverter Pro* will convert one sound format to another; compress samples by 3:1 or 6:1 (and decompress compressed samples); and downsample them (from 22.2kHz to 11.1kHz). It also supports *SoundEdit* files, System 7 sounds and suitcases, and Sound Mover suitcases which include applications containing sounds such as *HyperCard* stacks. Basically, you can extract SND resources from any file.

One of the cutest things about the program is the animated sequence which morphs between the icons of the three sound formats. It also has a lot of options in the **Preferences** menu which you can customise.

7. *DigiTrack* enables you trigger a number of sounds via the Mac's keyboard and record them using a very simple sequencer – you can't save the recording to disk, though. If you don't



Sample Editor is the best, erm… well, shareware sample editor for the Mac.



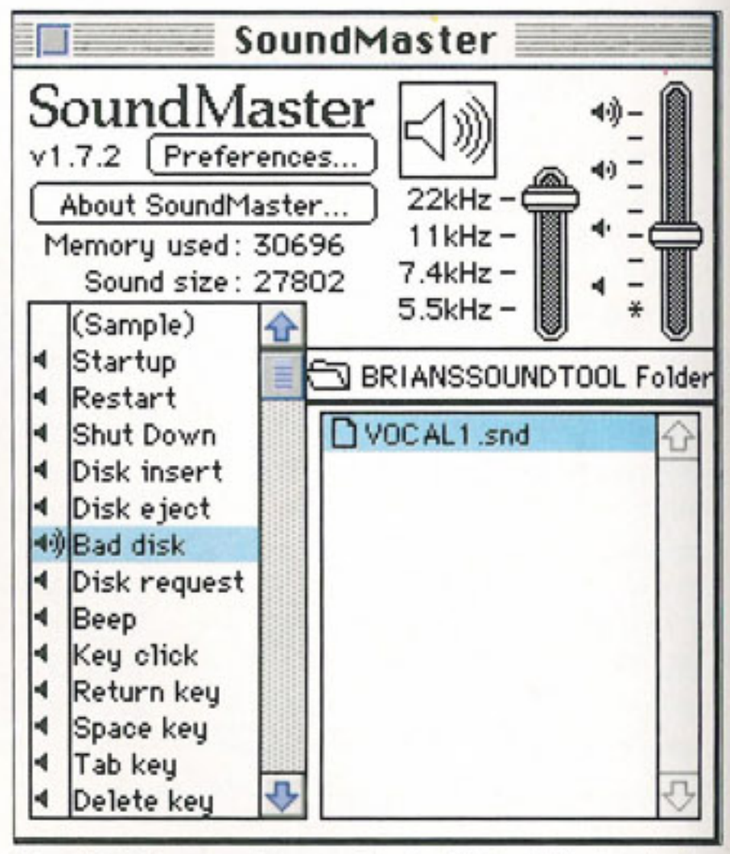
SndConverter Pro can save a sound in one of four formats and compress it to make it easier to store on disk.

mind getting your hands dirty with *ResEdit*, you can also create your own files to contain a collection of sounds.

8. *Mono2Stereo* performs a far simpler function – it merges two mono sounds into a stereo sound. You'll be able to hear this if you have a stereo Mac; otherwise the two sounds will simply play together.

9. *Sample Editor* shows a sampled sound as a waveform, which you can then edit with cut, copy and paste functions. It's easy to create the infamous 'N-N-N-N-Nineteen' effect. You can zoom in on the waveform, and the program can compress files up to a factor of 6:1. It also has processing functions such as fade in and out, reverse, digital delay, crossfade and mix. It comes with an extensive user guide and supports Balloon Help.

10. So, having hacked your way through tons of file formats and created several dozen SND files, what do you do with them? Well, you could assign them to different Mac operations using the *SoundMaster* control panel. This enables you to assign different sounds to a maximum of 25 Mac tasks, such as startup, shutdown, disk eject, disk request, copy done and even emptying the trash. *Ian Waugh*



SoundMaster can make your Mac barf when it finds a bad disk. Now ain't that progress?

WHERE TO GET SOUND FILES

PC shareware libaries
- Omicron (0702 710391)
- Red Dragon (0745 338094)

PC bulletin board
- Sonic Boom (081 9949119)

Mac shareware libraries
- Stormont Software (0232 487923)
- Kingsway Computer Services (0742 750623)

Mac Bulletin Board
- Electronic Courier (0232 705452/ 401737)
- Voice (0232 791233)

Win a Screenie!

Do you spend half your time personalising your Mac with Extensions, utilities and gimmicks? If your monitor is looking a bit boring by comparison, Screenies are the ideal answer. They stick on the front of your monitor and are guaranteed to brighten up even the dullest Mac. To celebrate the UK launch, we've got ten Screenies up for grabs.

Screenies are the invention of California gallery owner Rusty Schwartz. They're made in the US from high quality art board and fix on to your monitor with small Velcro pads, so you can swap them over according to your mood. One size fits all 13, 14 and 15-inch monitors. They are available from Solutions on 081 531 3701.

To win a Screenie, all you have to do is answer the following questions:

1. Where are Screenies made?
2. Who invented Screenies?
3. How do they fix on to computer monitors?

Put your answers on a postcard or stuck-down envelope along with your name and address and send it to: **'Window Dressing', MACFORMAT, 30 Monmouth Street, Bath BA1 2BW**. The first ten correct postcards drawn from the sack will win. The closing date for entries is **Friday 15 July** and the editor's decision is final. Oh, and please state if you don't want your name added to a mailing list.

The ten winners will be able to choose their prize from the following list of Screenies:

Wipe-Off Board	Corkboard
Retro TV	Etch-A-Sketch
Gold Frame	Howlin' Woof
Cat Box	English Garden
Write-On	Photo Frame

ALL PRICES INCLUDE VAT & DELIVERY – NO HIDDEN EXTRAS

MACFORMAT promotions

Once again MACFORMAT has searched high and low to bring you the best Mac products at the best prices...

Style victims

Yes, you too can be the proud wearer of one of these strictly limited edition MACFORMAT T-shirts. Available in large and extra large in a fetching dark blue, these T-shirts are ideal to impress your friends with your Mac knowledge.

MACFORMAT T-Shirt
Price: £9.95
Order code: MACFTSL (large), MACFTSXL (extra large)

600Mb of programs!

The BMUG PD ROM contains over 600Mb of the best shareware software from all over the world, collected by the Berkeley Macintosh Users Group and put on one CD-ROM (1994 edition).

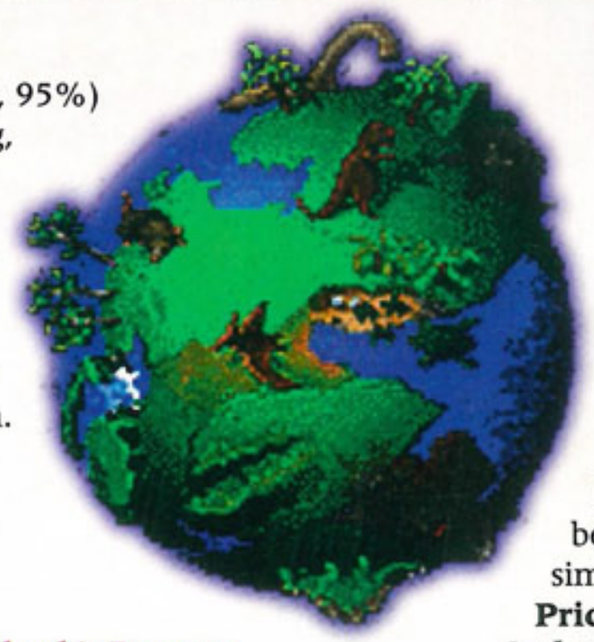
BMUG PD ROM CD
Price: £39.95
Order code: MFBMUGCD

THE MACFORMAT CLASSICS

In the last year, MACFORMAT has awarded its coveted Classic award to just four truly outstanding games. We think these games are the ultimate in gaming on any computer, not just the Mac, and we are proud to offer them to you direct from the magazine. They're a must, simple as that.

Myst
(MACFORMAT February, 95%)
An adventure that has you exploring an island world with enthralling puzzles to solve and luscious visuals. This graphics extravaganza comes to you on CD-ROM.
Price: £39.95
Order code: MFMYST

Civilization
(MACFORMAT June, 95%)
Start with nothing, conquer the world and reach the stars in just 4,000 years. Simply the most addictive strategy game ever written.
Price: £34.95
Order code: MFCIV



LeChuck's Revenge: The Secret of Monkey Island 2
(MACFORMAT September, 95%)
A graphic adventure from LucasArts full of excruciating wit and fiendish conundrums, with a superb soundtrack, lovely animation and memorable characters. In short, it's one of the best adventure games ever conceived.
Price: £39.95
Order code: MFMONK2

MACFORMAT Classic

SimCity 2000
(MACFORMAT February, 95%)
The updated version of the original Macintosh classic, *SimCity 2000* is a beautifully illustrated and finely detailed simulation with hours of gameplay.
Price: £37.95
Order code: MFSIMC

ORDER NOW! CALL THE HOTLINE ON 0225 822511

Need help with ClarisWorks?

If you need to know more than the manual tells you, then try this Black Mouse guide to *ClarisWorks*. Inside you'll find pages of practical advice and worked examples to help you get the most from your software. Special MACFORMAT offer – £2 off RRP.

***ClarisWorks* book**
Price: £7.95
Order code: MFCWKB

Excel, *Word* and *FileMaker* help

In the same series of Black Mouse guides are books teaching you the best of Microsoft *Excel 4*, Claris *FileMaker Pro* and Microsoft *Word 5*. All are available at the same bargain price.

***FileMaker Pro* book**
Price: £7.95
Order code: MFFMPB

Microsoft *Excel* book
Price: £7.95
Order code: MFEXLB

Microsoft *Word* book
Price: £7.95
Order code: MFWD5 B

The essential shareware collection

No fewer than ten high density disks, packed with the very best shareware and freeware programs. No demos, just top-notch shareware software. Too many to list, but included are the latest versions of: *Disinfectant*, *SoundMaster*, *Apollo*, *BeHierarchic*, *FileTyper*, *Maelstrom*, *Graphic Converter*, and over 100 more. All programs work with System 7 and a colour monitor – some require them. Ten disks for just £19.95!

Shareware collection vols 1-10
Price: £19.95
Order code: MFSHARE1

SCSI problem solver

Our Mac Answers section is frequently asked about problems with external SCSI devices, like scanners or external hard disks. Nine times out of ten the query can be traced to a problem with termination – the last device must either be terminated internally (the manual will tell you if it can be), or you must fit an external terminator. They can be little blighters to get hold of, so MACFORMAT has got some for you.

SCSI terminator
Price: £14.95
Order code: MFTERM

Annoying or what!

As irritating puzzle games go, this one certainly fits the bill! You have to get the Tinies to sleep by moving them around ever more complicated mazes. This brainteaser gets harder and harder until you end up throwing the mouse through the screen. If you like puzzles, don't miss this – especially at the bargain price of £14.95!

The Tinies
Price: £14.95
Order code: MFTINY

Join the Syndicate

You tried it for yourself on last month's cover disk, now upgrade to the full mission-packed game. *Syndicate* combines action with strategy to create a truly enthralling virtual world. We gave it 92% in last month's issue, so why not try it for yourself?

Syndicate
Order code: MFSYND
Price: £38.95

Take up your sword

There's never been a game like this on the Mac; it definitely lies on the sword side of the 'Sword and Sorcery' equation. *Deliverance* features graphics and gameplay not dissimilar to the classic *Shadow of the Beast*. If you are bored of strategies and shoot-'em-ups, try hacking and slashing your way through *Deliverance*.

Deliverance
Order code: MFDELIV
Price: £36.95

Keep it clean!

Regular readers will now have over a year's worth of MACFORMATS on the shelf, so to keep them tidy and in an absolutely pristine condition, why not store them in a specially designed MACFORMAT binder? Adorned with the MACFORMAT logo, the binder will keep your issues in perfect nick.

Binder
Order code: MFBIND
Price: £6.50

Get networked!

Networking two Macs means you can move files without using floppies, run applications on the other Mac, and share printers. You'll need one kit per Mac (includes about 2m of cable) and an extension cable if your Macs are further than 2m apart. System 7 is required (not inc).

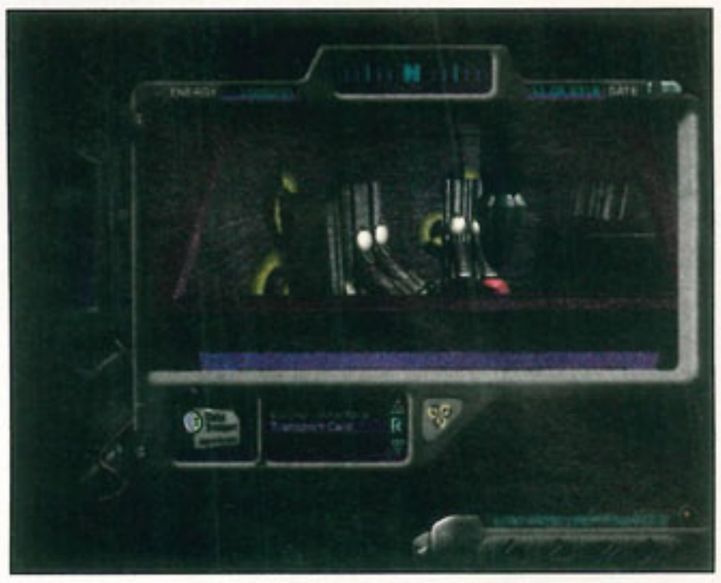
AppleTalk connector kit
Price: £29.95
Order code: MFNET
10m extension cable
Price: £19.95
Order code: MFEXT

THIS MONTH'S MACFORMAT SPECIAL

The Journeyman Project

This CD-ROM adventure spans millions of years and tens of millions of miles in a mission to prevent a time disturbance pitching the Earth into a war with aliens. Stunning graphics and animations lend a unique atmosphere to one of the very best CD-ROM games around.

Journeyman Project
CD-ROM
Order code: MFJOUR
Price: £34.99



Enter a huge futuristic world where time travel has become a reality. By journeying back in time, you have to protect the entire history of the Earth. Not much to ask really.

The silliest software ever!

UnderWare is a screen saver, and it can customise the desktop background, but it's much more than that. It's fun. In fact it's downright silly. *UnderWare* animates the screen as you work! Tarzan swings in and collides with the window, a thief makes off with your 68000, babies crawl everywhere, a dragon burns holes in the desktop and so on. It even runs *After Dark* modules in the same way. *UnderWare* has to be the ultimate Mac customiser! We gave it 93% in February's issue. Imported direct from the US, where it costs $59.95, MACFORMAT brings you total silliness for just £34.95.

Underware
Price: £34.95
Order Code: MFUNDER

The ultimate value modem

We rate the US Robotics Mac & Fax as one of the best modems around, and now that USR have slashed their prices, we can bring it to you for an extraordinary £220. Only six months ago, it was £469!

The Mac & Fax is a super-fast modem that can transfer data at up to 56,000 bits per second – 20 times as fast as a typical 2400 modem. It does this by combining raw speed (14,400 baud) with the v32 compression system which shrinks the data before sending it. The modem works with any on-line service and comes complete with a Mac cable and all the software you need to access computers worldwide.

As well as being a modem, the Mac & Fax includes software which enables you to send faxes direct from your Mac, simply by printing from your document as normal, and the Mac & Fax can receive faxes too.

All in all then, it's pretty fab and you definitely shouldn't be without it. Our price for this remarkable piece of kit? Only £220!

US Robotics Mac & Fax modem
Price: £220
Order code: MFMODEM

HOW TO ORDER FROM MACFORMAT PROMOTIONS

MACFORMAT welcomes credit card orders by phone on our hotline – 0225 822511 – or you can use this coupon.

Please send me the items I have listed below

TOTAL £.....

(Overseas orders: please add £5 per item (£10 for the modem). Payment must be by credit card or by Sterling cheque drawn on a UK bank account.)

Please indicate method of payment:

☐ I enclose a cheque made payable to Future Publishing for £.....

☐ Please debit my Mastercard/Visa (delete as applicable) with £.....

Signed.....

Card no.....

Expiry date .....

Name .....

Address .....

.....

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Postcode.....

Send this form or a copy to: MACFORMAT mail order, Future Publishing, FREEPOST (BS4900), Somerton, Somerset TA11 6BR. (No stamp required if you are posting from within the UK.)

Product.....Order code.....Price .....

Product.....Order code.....Price .....

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SHAREWARE AND PD

Handy utilities, nifty extensions and groovy applications – Andy Hutchinson scans the Internet for all the latest shareware...

Calculator 2

DESKTOP CALCULATOR

Freeware

I've decided to include this desk accessory for one simple reason – it's one of the few I've found that actually does percentages. The calculator which every single Mac on the planet comes equipped with is fine for the odd little calculation (like knowing how much you owe the sandwich man), but for slightly more complex sums, it's a bit crap.

Traditionally, replacement calculators have fallen into two camps – those for mathematicians and those for programmers. It would seem that real people don't need to add things up. So it was a relief when I chanced on this particular accessory – especially as it's freeware.

Besides looking a damn sight more attractive than Apple's slimline control panel, *Calculator 2* includes handy functions that will suit normal folks, as well as those who are versed in reverse Polish notation. For all you number fiends, *Calculator 2* includes: sine, cosine, tangent, value of pi, Natural Log, Base 10 Log, a Backspace Key, a Power function, a square root function, a Square function, arc sine, arc cosine, arc tangent, a Factorial function, Constant e raised to a power, Constant 10 raised to a power, an Nth Root function, a Cubed Root function and expression 1 divided by x.

And for the rest of us mortals, it has a 'clear' key, addition, subtraction, division and multiplication options, a percentage key (and it's a proper one too!) and a memory button for storing that running total in. More to the point it doesn't take up the whole desktop window when you select it. Numbers for normals.

Dialectic 1.2

LANGUAGE UTILITY

Freeware

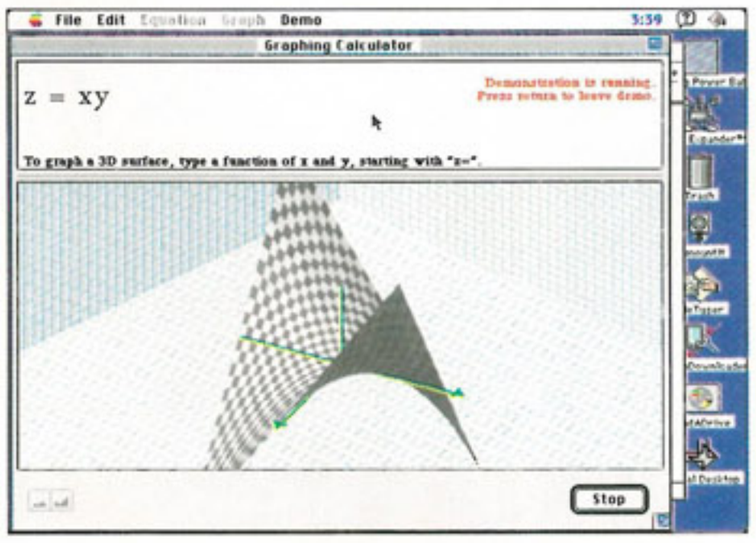
Some of my favourite utilities are completely stupid. You know the sort of thing – they put creatures in your trash can, eyes on your desktop and spirits in the machine. They're the sort of programs that the Macintosh is all about; ask yourself when you last saw something funny on a PC – apart from *Windows*, that is.

Dialectic converts text files. However, it doesn't transform *Word* format into *WordPerfect* or ASCII into RTF, dear me no. It converts your text into one of eight odd formats. You can take your pick from oddities like Morse Code, Olde English, Pig English, or a transpositional code. The best two, though, are Chef and Ubby.

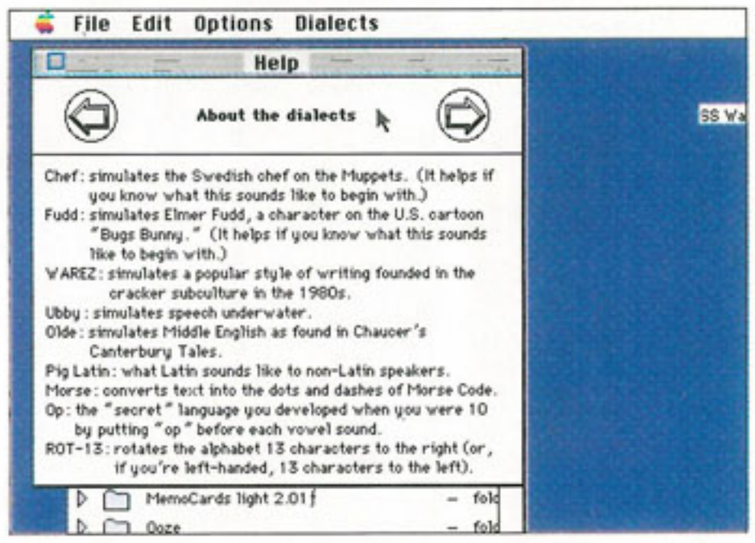
Remember the Swedish chef from the *Muppets* who spoke in that ridiculous accent? Well, now you can convert your text so that when it is read aloud, it sounds just like him. Or how about an underwater accent? I'll illustrate the point by showing you four conversions.

Normal: The rain in Spain falls mainly in the traditional tourist areas subsidised by the Government to get hordes of English travellers installed in its ugly hotels.

Chef: Zee reeen in Speeen fells meeenly in zee



For the mathematically well adjusted, *Calculator 2* can create highly impressive 3D graphs, while the rest us can look forward to the luxury of a percentage button.



With the freeware utility *Dialect 1.2* you can take a perfectly legible piece of writing and turn it into complete nonsense – now, ain't that progress?

WHERE'S IT FROM?

People often ask us, just where do you find all this great new shareware? The place to go for the most up-to-date stuff is (of course) the Internet, the international comms network. I keep an eye on the Usenet news group comp.sys.mac.digest, where every week or so a list of new shareware is posted by the administrators of the Macintosh anonymous ftp site mac.archive.umich.edu. It's there that I find all the software that you see here.

If none of the above made sense to you, then stick to the other sources of shareware listed in the 'where to get it' box on page 93. (Or, of course, read our Comms pages until you start understanding terms like 'anonymous ftp'.) But if you've access to the Internet, or can use anonymous ftp in any form, then check out the umich archive (or its UK mirror, which is at src.doc.ic.ac.uk). It's the best source of up-to-the-minute shareware I've found.

PD & SHAREWARE – WHAT EXACTLY ARE THEY?

PD is short for 'public domain'; it's software that may be freely shared around among users – there is no fee to pay. It can be obtained from PD houses (companies which specialise in collecting together and distributing this sort of software, usually for a fee), user groups and bulletin boards.

Actually, most free software isn't PD – it's what's known as 'freeware'. This is because putting a piece of software into the public domain deprives the author of any rights to, or control over, that software. So someone else can modify it, claim ownership of it and even sell it as a commercial package. Most programmers are not at all happy at that sort of thing, so the concept of 'freeware' was created. This is software which you can use for no charge, but which the author still retains rights over. For example, many freeware authors specify that their programs must not be altered, and may only be distributed if they are accompanied by the documentation files. For simplicity, though, most people still refer to this type of software as 'PD'.

Shareware is a form of 'try before you buy' software selling. You can obtain the programs from the same sources as PD and freeware, but if you like the software, you send the author a contribution – normally somewhere between $5 and $40 (most shareware authors live in the States). In return for this 'registration fee', you often get upgrades or documentation, so it's well worth paying up.

tredeeshunel tuooreest erees soobseedised by zee Gufernment tu get hurdes ooff Ingleesh trefellers instelled in its ugly hutels. Bork Bork Bork!

Underwater: Thuhbe ruhbauhbin uhbin Spuhbauhbin fuhballs muhbauhbinly uhbin thuhbe truhbaduhbituhbiuhbonuhbal tuhbouhburuhbist uhbaruhbeuhbas suhbubsuhbiduhbisuhbed by thuhbe Guhbovuhbernmuhbent tuhbo guhbet huhborduhbes uhbof Uhbengluhbish truhbavuhbelluhbers uhbinstuhballuhbed uhbin uhbits uhbugly huhbotuhbels.

Olde English: The reynne inne Speynne falls meynlee inne the traditiounal towristte arese subsidisede bee the govrenmentte to gette hordes of English travellres installede inne its uglee hotels.

Fudd: De wain in Spain fawws mainwy in de twaditionaw touwist aweas subsidised by de Govewnment to get howdes of Engwish twavewwews instawwed in its ugwy hotels.

Patriot Command

ARCADE GAME

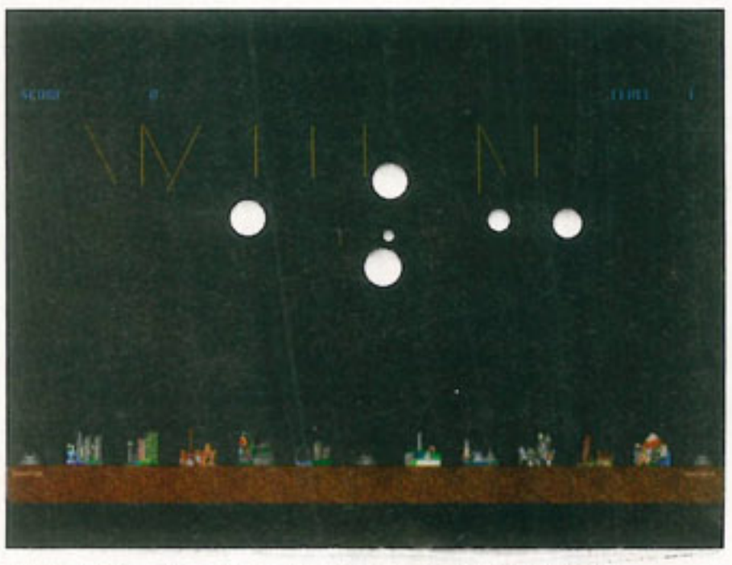
Shareware – $25.00

Way back in the mists of time, when arcade games lived in arcades and not fairgrounds, you used to have five different machines: *Pacman*, *Defender*, *Hyper Sports*, *Moon Cresta* and *Missile Command*. *Patriot Command* is a '90s style version of the last, so here we go with another dose of revisionist gaming.

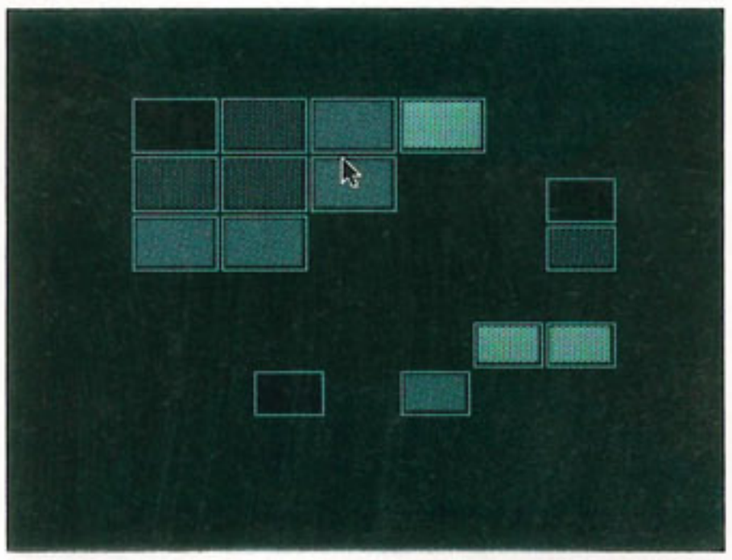
The idea's simple. You've got to defend six cities from incoming ICBMs. To do this, you send up your own rockets which, if detonated at the correct moment, will destroy the incoming missiles. If an ICBM lands, you lose a city; lose all six and it's game over for bytemanity.

The graphics have been updated heavily since the arcade version wowed audiences with its trackball control system. Using a mouse instead of a trackball actually works well; it's very easy to zip your crosshairs around the screen and the only problem left is how to tactically destroy 50 incoming missiles with only 30 of your own rockets.

The sound's especially funky. When you finally perish by losing all your cities, you hear a sample from *Bill and Ted* which says, 'Like, game over, dude.' I'm happy to report that there was no noticeable slow down on smaller Macs, but unfortunately it'll only work in 256 colours. Which counts my Duo out for a start. A worthy addition to every shoot-'em-up gamer's collection. And for those of you who are wondering, this version of *Patriot Command* is more recent than the one featured on the MACFORMAT cover disk back in issue 7.



As the Russians show off their new low-cost defence software, rumour has it that their Patriot missiles are powered by an elasticated slingshot...



Try to destroy all the tiles without putting your fist through the screen – that's the challenge that awaits you with the *Breakout*-like *Shatterball*.

Shatterball

PADDLE AND BALL GAME

Shareware – $5

Remember *Pong*? The very first home consoles had this archaic tennis game on them, the idea being to bounce a square blip back and forth around a screen. *Shatterball* is based on the same idea, but it also includes some *Breakout*-style gameplay. You play the game looking down a tunnel, in which there are loads of squares. The idea is to bounce your ball down the tunnel, destroying all the squares.

Unlike most games, you can play any of the levels right from the start. There are 40 of them in all, ranging from the simple to the downright frustrating. The tiles that you've got to zap are arranged in a variety of formations, meaning that there's usually one stubborn blighter which won't budge, no matter how well you aim the ball.

For such a simple game, this is surprisingly playable. The fact that you can play any of the levels at any time means that if you get frustrated with one, you simply have a bash at the next. Or to put it another way, I tried all of the levels, several times. But then I'm getting paid for this and I'm allowed. Hurrah.

Memocards

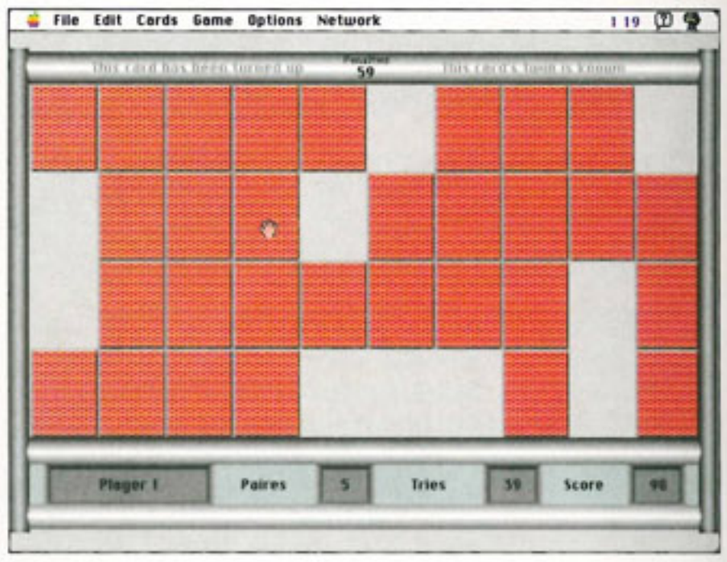
MEMORY GAME

Shareware

How good's your memory? Personally, I have trouble coping with my own telephone number, but that's journalists for you. This game will test your memory to the limit. It's one of those mix and match games where you have to pair up a load of cards by remembering whereabouts they're positioned on a grid.

The game is colourful and I particularly like the designs of the cards – the pussycat's especially nice. Sound's fab too: plenty of bongs and beeps for when you've identified a card. There are plenty of options as well; these dictate things like the amount of time you have to choose a card and the size of the grid.

However, what I particularly like about this game is that you can play it over a network. To do this, you sign in and then choose someone else on your network who's got the game loaded – it saves the two of you hunching over the same Mac and quickly swapping the mouse over. This is a fab game which is designed for kids, but appeals more to 'adults'.



Memocards is a colourful, brain-squishing memory test game, but the best thing about it is that two of you can play it over a network – and the boss will never even know.

System 7 Pack

FINDER UTILITY

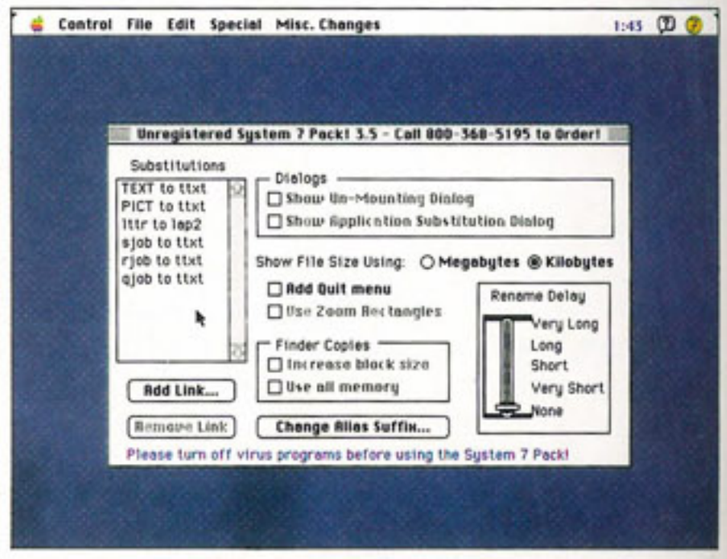
Shareware – £12

Here's a program which works along similar lines to *SpeedyFinder* (featured on the cover disk of MACFORMAT issue 11). It's designed to speed up the daily running of your desktop by streamlining commonly used functions. It operates by actually modifying your Finder file, so the programmer recommends that you back up that rather important file before doing anything.

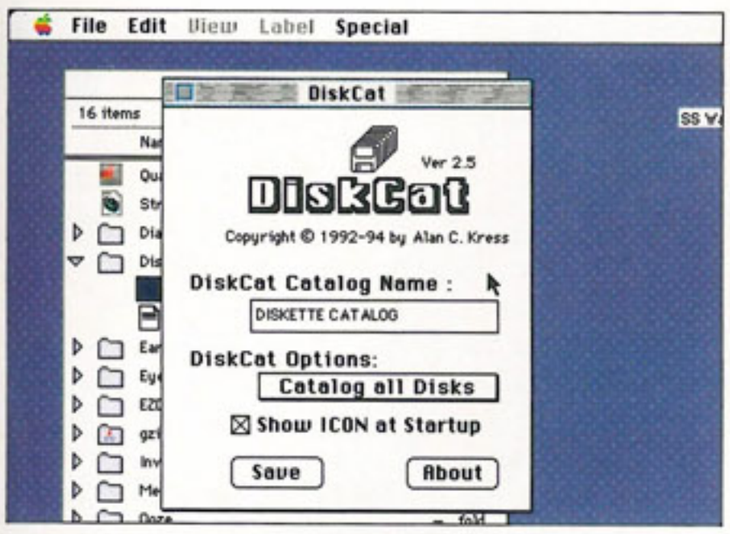
Functions include an accelerated Empty Trash, Shut Down, Restart, and Sleep, along with toggle switches for those zoom windows which zap across the screen when you start up, plus improved memory management functions.

The program's split into two parts, a Control Panel and the actual System 7 Pack. The front-end enables you to speed up file renaming, change the file size windows and fiddle with creator prefixes. Most of its functions operate in the background, though, so you don't really notice it's there until it does something fast.

As to its usefulness, the good news is that, first, it didn't crash the System and, second, that there isn't any bad news. To be honest, I'm not sure how useful many of this utility's functions will be – they were Greek to me. However, anything that speeds up the Apple desktop can't be a bad thing.



Does your hair grow two inches in the time it takes you to empty the trash? No, mine neither. But if it does, this utility could give your Finder the extra zip it needs.



Forever losing your back-up disks? Can't remember what you called them? This feline superhero can save the day by keeping a log of all those places and names.

DiskCat

FILE FINDING UTILITY

Shareware – $20

If you're a sensible Mac user, you'll have lots of floppy disks on your desk, chock full of backups of all those important files. The problem is that tracking down the right file's a bit of a nightmare – especially if you're really conscientious and have got hundreds of the blighters.

The purpose of *DiskCat* is to keep track of these diskette files in a catalogue on the hard drive. This frees up space on the hard drive for more important files. The program goes about this by storing file name images in the catalogue, rather than the actual files themselves. So, when you want to find a particular file, you use the normal **Find** utility (**[command] F**). This searches both your hard drive and your diskette catalogue, and then lets you know which disk it's on. So it's not a lot of use if you don't label your disks clearly.

This is a small, simple program which does its job efficiently. The Control Panel's not much to look at, but when you consider the grief it could save you, it's well worth the shareware fee. Unless you're one of those lucky sods with a Syquest drive attached to your Mac, that is. I'm not impressed, you know.

EZDB

DATABASE PROGRAM – BETA VERSION

Shareware – $10

Let's do a little straw poll. How many of you own a database program? Lots, huh? How many of you know that program intimately? Fewer, huh? Right then, how many of you are completely perplexed by all but the most obvious of features in the program? The vast majority of you, huh? Me too. The trouble is that nobody's got enough time to really learn the nuts and bolts of big database programs, so you've spent all that money for a program running at a fraction of its potential.

The programmers of *EZDB* realise that most of us don't use that many features in a database program, so this is a basic one which includes only the most basic of commands. It enables you to create a template, store data on it and print it out. It won't do tables, charts, graphs, biorhythms or tax returns.

Once you load the program, you can create your card (let's say an address book) and this is saved to disk. Then you enter all your data. Once you're happy that it's all in there, you can browse through it or search for a particular card. If that's all you use your current database for anyway, then this particular program is well worth checking out.

Gzip

FILE COMPRESSION UTILITY

Freeware

Anyone who's downloaded files from the Internet will be familiar with ZIPped files. Practically every file on the network is compressed using this format. Which means that unless you can unsquish them, you're wasting time and band width on the net.

Gzip decompresses ZIPped files. It doesn't do it terribly elegantly, but then most previous ZIP programs were text driven and about as friendly as a paparazzi-cornered Marquis. The programmer warns that the larger the file you're decompressing, the more unstable *Gzip* becomes. It didn't crash on me, though.

Ooze

MULTIMEDIA MAGAZINE

Shareware – $1

Getting your name into print's a lot easier since the dawn of the computer network. There are plenty of on-line newsletters around, covering everything from news to human sexuality. This, though, is a decidedly tongue-in-cheek multimedia newsletter, full of decidedly American humour.

The whole thing is put together in DocMaker format, which means that it includes text, piccies and samples. To read it, you just click through the pages and on any icons which happen to be on the page.

We wouldn't want to say that all Americans are soulless individuals with no sense of humour – but with tripe like *Ooze* about, is there really any question?

As to the content... well, it's a bit crap. I'm not complaining about the jokes that go over my head (because they refer to Americans I've never heard of), but the ones which are just plain awful. Anyway, make your own mind up – here are a couple of examples:

Odd Prom Theme 1: An Evening in the Gulag
Song: 'We Gotta Get Outta This Place' (The Animals)
Meal: Lumpy gruel for first five couples, everyone else sits on the floor and starves.
Decor: Hard Labour, solitary confinement, dirt, fake snow storm, Principal shoots at people who try to escape.

Odd Prom Theme 2: JFK Assassination
Song: 'Hit Me With Your Best Shot' (Pat Benetar)
Meal: Head Cheese sandwiches, Boston Creme Pie, Jelly Doughnut.
Decor: Zapruder film looped, a grassy knoll, prom pics in cut-out of President's limo at moment of death, prom program printed on recycled Warren Commission reports.

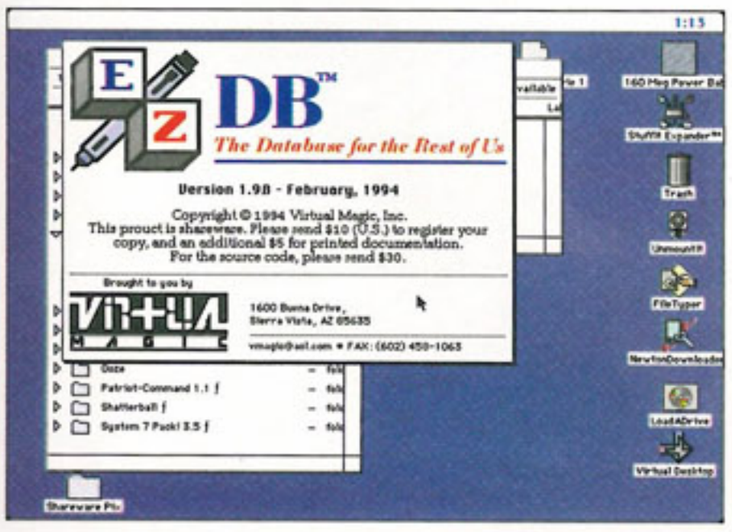
Stress Test

FILEMAKER PRO STACK

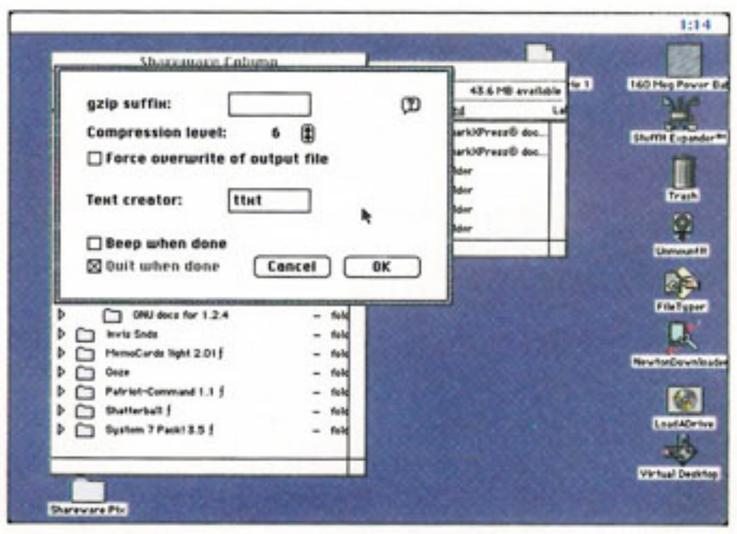
Public Domain

This *Filemaker Pro* document is a stress analyser. It asks you a series of questions and you give the program one of five answers. Then it adds everything up and tells you absolutely nothing you didn't know already. I don't consider myself to be the most stressed out person in the world, but I gave it a whirl anyway.

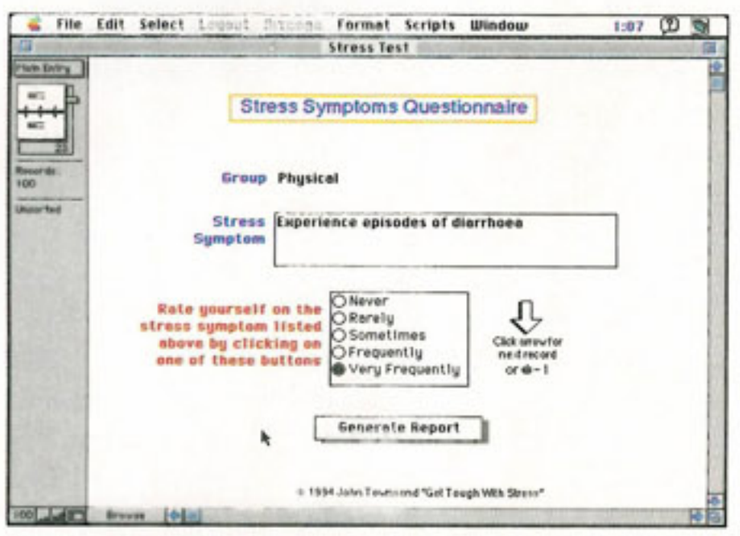
The test is split into different sections such as emotional, physical and spiritual. It asks you something like, 'Do you drink more than four



If you only really use your current database as a glorified Filofax, then EZDB is the program for you: it won't do tables, charts and graphs, but it will store and print out your data.



It may not be particularly elegant, but *Gzip* will enable you to decompress ZIPped files – and it's a lot better than many of the previous text-based compression utilities.



We can't help thinking that if you're suffering from very frequent bouts of diarrhoea, you need something a little more practical than a Mac stress analyser.

cups of coffee a day?' and you click on 'Never', 'Rarely', 'Sometimes', 'Frequently' or 'Very Frequently'. After you've waded through all 100 questions it picks out every time you clicked on 'Frequently' and 'Very Frequently' and informs you that you're stressed out.

In my case, it told me to seek professional help. I'll gloss over the accuracy of that diagnosis and say instead that you're likely to learn more from the 'Does he fancy me?' quizzes in *Smash Hits*.

The *FileMaker* layout's easy to find your way around, but I'd like to take issue with the syntax used. For instance, it asks questions like, 'Do you seldom read a book?' So, are you meant to click on 'Never' if you don't read books or 'Never' if you always read books? It's thoroughly confusing, especially the question about colitis!

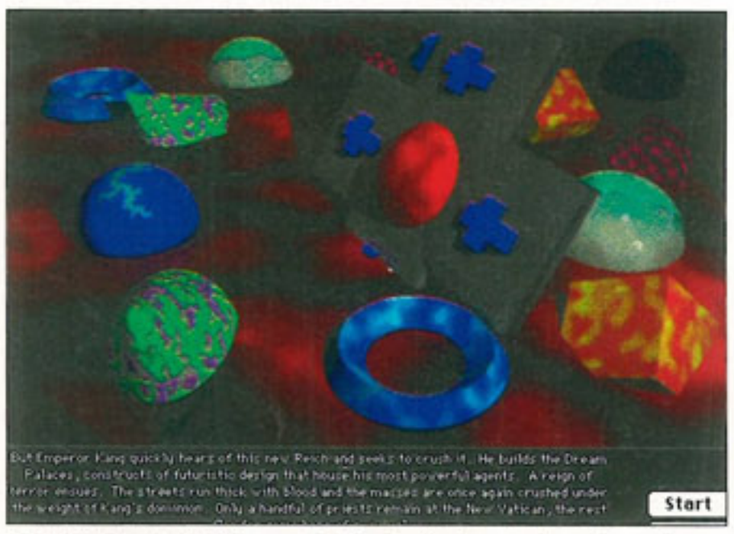
Digital Messiah

ROLE PLAYING GAME

Shareware – $20

Those nasty corporations have been up to their dirty tricks again. More to the point, the Japanese companies are becoming as powerful as the Governments. No sooner had the US convinced these Japanese super-corporations to drop their restrictive trade practices than they promptly bought out the Governments of the world and set up in the global domination business.

Thus begins *Digital Messiah*. The SuperCorps (copyright, me) have gone a bit nutty and begun the systematic eradication of every lifeform on Earth. Out of this amazing anarchy comes spiritualism and wizardry – oh, and you. You're the digital messiah of the title and your job is to return the Earth to its old screwed-up ways. Shouldn't be too hard, eh?



Digital Messiah's intro certainly looks impressive, though we must admit we haven't got a clue how it ties in with global domination, or even the stumpy guy with the beard.

To complete your quest you're able to call on all sorts of magic spells and incantations. These enable you to do battle with the horrible creatures which are piddling around the Earth, just waiting for an unsuspecting digital messiah to turn the corner, so they can give you a good kicking. Initially you have all the spell-casting ability of a dead haddock, but as you complete quests, scrap with wotsits and deal with cyborgs, so your abilities improve.

The game is viewed from overhead. Your little chap's represented by a sort of squashed twig icon, while the bad guys look like those anonymous plastic 'gifts' that pop out of Christmas crackers and into your soup. As you toddle around the gameworld, so more of the map gets uncovered. Do plenty of wandering and you'll soon be able to see the whole world – all of which makes getting from A to B a bloody sight easier.

When you encounter one of the bad guys, the screen transforms into a simplistic shoot-'em-up. The evil one zips around the top of the screen from left to right, and you zip around the bottom of the screen from left to right. He fires at you and you fire back. It has to be said that this is largely a sporadic effort; if I won one of these battles it was only because I was just hammering the keyboard randomly.

Besides all the evil guys, there are a couple of characters who are on your side. Bump into these and they'll send you off on a quest – either to scrap various numbers of baddies, or acquire a widget for them. Once you've completed the task, you've got to find them again (no easy task) and they'll then award you some extra energy and a couple of new spells.

Visually the game is great. The intro sequence includes some superb rendered piccies (which detail the story of the corporations) and the plan-view maps are sexy too. The sprites aren't up to much, but they get the job done. Sound is brilliant – lots of samples and some funky soundtracks.

Gameplay's easy to get to grips with. You can reassign any of the control keys – although I found the original settings to be perfectly adequate. Movement through the gameworld is fast and this can be improved by tweaking the Frames Per Second option on the menu screen.

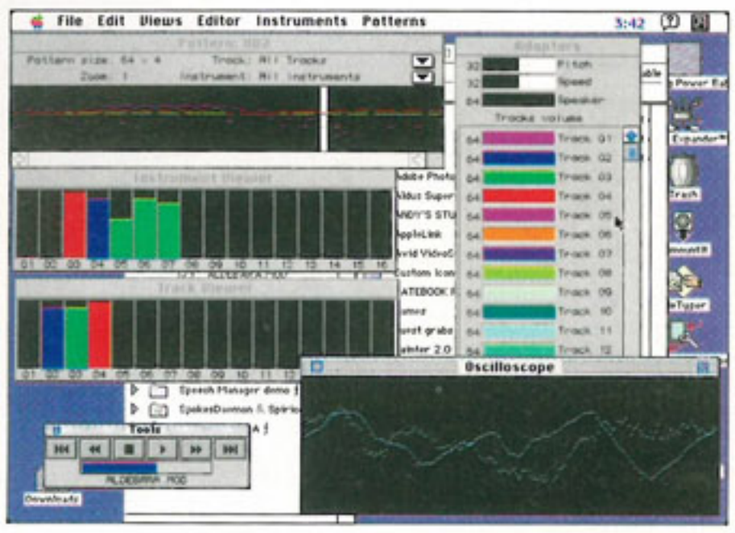
Digital Messiah's a very well designed game, which is let down slightly by the plan-view graphics. I can't help thinking that a first person perspective would have better suited this kind of game. However, I kept on playing it despite the fact that I kept dying, so I guess you could say that it's addictive. If you do get hold of this game, never ever trust the stumpy geezer with the beard.

Player Pro

SONG CREATOR/EDITOR

Shareware – $40

The vast majority of sound applications for the Mac are sample editors and players, such as *SoundMaster*. *Player Pro*, however, is a program which enables you to actually create songs by loading samples into memory and recording your tune. It's one of the most comprehensive 'tracker' programs I've encountered, and I can't recommend it highly enough.



Player Pro is one of the most comprehensive 'tracker' programs around; it enables you to create your own songs by loading samples into memory and recording your tune.

There are so many windows in the program that your screen ends up looking like a NASA control desk. These enable you to record, mix, play back your song and analyse each individual portion of it. You can even display an oscilloscope of your wave data – which enables you to work out exactly why it sounds so bad.

The sample tune included with the program shows just what *Player Pro's* capable of. Play around with this and you can soon get to grips with the intuitive control menus. I particularly enjoyed remixing this song by fading in and out all the different channels. My own tune sounded like a pack of blue whales making love in a thunderstorm, so I might just release it as a record and watch it zoom up the charts.

Easy Envelopes

ENVELOPE PRINTING ACCESSORY

Shareware – $15

If you've ever tried to get your laser writer to print out on an envelope, then you'll know what an almightily frustrating process it is. It would seem that page setups are designed specifically to clash with each other and just when you've got your DTP program or word processor to fit the text in the right dimensions, the printer decides to spew out its contents sideways.

This tiny desk accessory enables you to store oft-used addresses within it and then print them out – although you can, of course, simply type in an address 'on the fly'. It uses a simple icon driven interface, which makes the whole sorry task much simpler. All you've got to do now is convince your printer to accept your envelopes – which is something I've never been able to master.

Quadris

TETRIS-STYLE GAME

Shareware – $7

Tetris has been around almost as long as Jimmy Tarbuck. It's one of those games that appeals to everyone, because it's as tricky as you want it to be. *Quadris* is a *Tetris* game with a difference: instead of matching lines up, you've got to match different coloured shapes up into groups of four.

The game's controlled just like *Tetris*. The shapes fall from the top of the screen and you have to rotate them into the appropriate configuration. You get bonus points for creating loops – and the larger they are the better. You don't get any points for spelling out your name, though, unless it's OOOO.

The playing field's smaller than *Tetris's*, so you have less time to think. More to the point, this game requires far more thought than *Tetris*, so don't leave anything on the cooker while you're playing. It can get deeply infuriating when the program refuses to give you the L shape you're holding out for.

This game's got to be 'Hutch's recommendation of the month'. It's not the flashiest game I've ever seen and it's certainly not the most original, but it's almightily playable. I loaded the game up just now to check the shareware details and ended up playing it for three quarters of an hour. Wretched thing.

THAT REMINDS ME

Early Bird

REMINDER UTILITY

Public Domain

Way back, when I got my first Mac (a Plus if you must know), I knew I needed a good diary program. I plumped for a small desk accessory called *Smart Alarms*. This came with a sister utility called *Appointments* and it kept track of my day-to-day life for about three years. And it did it bloody well. *Early Bird* supersedes *Smart Alarms* and *Appointments*. I'm not quite sure why this is now a public domain program, especially as you can still buy *Smart Alarms*, but there you go.

Early Bird is a desk accessory. It sits in your Apple Menu Items folder, ready to be called on, no matter what application you're using. When you call the program up, it shows you the current calendar month, along with a window containing any reminders for the current date.

To enter a new reminder you just click on the **Remind** icon. Here you can decide when you want reminding, how much advance warning you want and how often you want it to nag you. Then you simply click on the **Done** button and it's stored away. Then, no matter what you're doing at the appointed time, a window appears with your reminder. You can tell it to snooze for a bit or that you've dealt with the matter and it'll get ready to remind you about something else.

You can view any of your reminders at any time by simply clicking on the appropriate date or by using a search string. If you want to move a reminder, you just click and drag it to the new date.

This is a perfect utility. It does its job simply, efficiently and with absolutely no fuss. It doesn't pretend to be a word processor or a fractal graphics generator; it's a reminder program, nothing more and nothing less. If you're always forgetting things and you're getting annoyed with commercial organiser programs which require complete anal retention, then get hold of this immediately. It could remind you to stop being so organised and get out in the sun once in a while.

Invisible Clock

TALKING CLOCK UTILITY

Freeware – System 7 only

At the third stroke, the time sponsored by Macintosh will be eight thirty-two, precisely... bleep bleep bleep. Or to put it another way, if you'd like your Mac to spout the time every quarter hour, you need this speaking clock utility.

The program comes in two bits, a Control Panel to configure the clock and the actual gubbins. You can run the latter at any time, so if you wish, it can be placed in the Startup Items folder. The former enables you to tweak the actual running of the program.

The Control Panel enables you to set the clock to announce every quarter of an hour, every half an hour or every hour. Each day can have different settings. For instance, you can have half hourly reports during the week, hourly reports on Saturday and no reports on Sunday.

Invisible Clock operates in the background, so that it won't interrupt whatever you're doing at the time. The announcements aren't too irritating either, especially as you can select a male or a female voice. If you're narcissistic, you can even use your own voice. Personally, I'm waiting for the celebrity voice files – I could live with Beatrice Dallé huskily telling me the time. Oh yes.

Eye on the clock

CLOCK/TIMER UTILITY

Shareware – $5

The final time utility program this month is a bit less serious than *Invisible Clock* and *Early Bird*. It's been programmed for all you poor nine-to-fivers who gaze at the office clock, counting the minutes until your tube home gets delayed by another bomb scare; the hours until the tea lady (bless her) comes round; or the days until the Print Monitor decides to stop preparing data and actually starts to print something.

Eye on the clock displays a series of dates and counts down until they're due. The examples the programmers have included with the program include keeping track of exactly how many days until a project is due; the number of weeks until special holidays, or events like birthdays and anniversaries; the number of seconds until the weekend; how many months old your baby is, and the number of days until your annual holiday.

You can display these countdowns in either a dirty great window or a little mini-window display. And, erm, that's about it. *Eye on the clock* is nicely programmed with colourful windows – and it works. But if you're the sort of person (as Loyd Grossman might drawl) who'd seriously consider leaving this chugging away on the old desktop, then I recommend an immediate career change. Life's too short.

Ever tied a knot in a hanky – and then forgotten why you did it? Yes? Well, then *Early Bird* is for you. Not only will it display a list of things to do, it'll nag you about 'em too.

As though chiming grandfather clocks weren't bad enough, your Mac can now interrupt your tranquillity with a talking clock announcement. Nightmare!

Eye on the clock can display a series of dates and countdown the days until they're due. Only recommended to the terminally bored.

WHERE TO GET IT

You can get hold of PD and shareware from a number of different sources. First, there are what's known as commercial PD houses (check the adverts in this issue for their contact addresses). These are companies which collect shareware and PD software, package it on to disks and then sell it on to you for a moderate charge.

Next come bulletin boards. To access one of these, you'll need a modem, of course, but once you're connected, you will find that there's a wealth of software available.

If you use the CIX bulletin board (modem phone 081 390 1244, any speed from 1,200 baud upwards, log on as 'new'), check out the 'files2' and '93.files' topics in the 'mac' conference – and, of course, our own 'macformat' area. If you use CompuServe (voice phone 0800 289378 for an information pack) there is a multitude of different Mac areas'; check the manual and the monthly magazine for details.

Finally, many Mac user groups (see page 107) have a range of PD and shareware available, and, of course, you can swap it with your friends – it's not software piracy; all of these programs are freely distributable.

5 great reasons to subscribe to MACFORMAT

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In MACFORMAT you get more than 1,000 pages of the latest news, helpful advice, essential tips, incisive reviews and top-class writing. MACFORMAT not only gives you the hard information you need to get more from your Mac, it does it with its own unique style. And it's more fun than any other Mac mag!

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On our cover disks you get more than 30 megabytes of the very best share-ware and freeware, and demos of all the very best games. We get our software from all over the world, and sift through hundreds of programs every month to bring you top quality software, just as soon as the programmer's finished it!

3

You get a choice of free gift worth up to £47 when you subscribe. If you want to use PostScript fonts with a StyleWriter, or just improve the quality of text display, you can have *Adobe Type Manager*. If you want to have no hair left in a week you can have the infuriating *Lemmings*. Or if you want to create an entire planet you can have *SimEarth*. The choice is yours.

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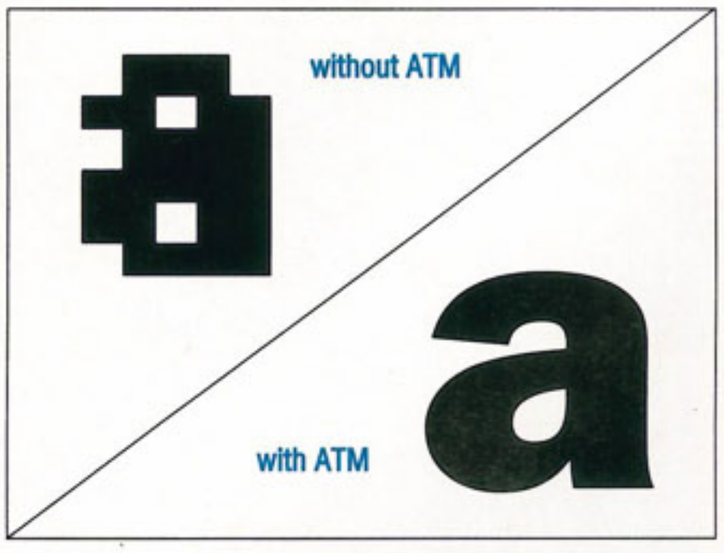
YOUR CHOICE OF FREE GIFT

Adobe Type Manager

FROM ADOBE, RRP £47



Adobe Type Manager is, quite simply, essential. It enables you to use PostScript fonts on any printer, including a StyleWriter or HP DeskWriter. It also makes PostScript fonts look superb on-screen, especially at large sizes. Jaggies disappear and what you see is actually what you get. Plus you get Adobe's wacky Wild Type font collection free!

Lemmings

FROM PSYGNOSIS, RRP £45

Lemmings is a true classic game, and you don't even shoot anything. Your mission is to save as many lemmings as possible, but the silly blighters insist on walking over cliffs, drowning themselves and getting trapped in holes. Only you can save them! An enthralling and irritating puzzle game, guaranteed to have you addicted in minutes.

SimEarth

FROM OCEAN, RRP £41

You start with the primordial soup and an empty planet. What you end up with is up to you! Maxis, maker of *SimCity*, got carried away and simulated an entire planet, and its geology, animal and plant life. If you can manage an ecosystem then you could create a swarming multitude of life. Otherwise it's a lifeless desert in store for this planet...

TAKE THE CD-ROM OPTION

MACFORMAT now publishes a CD-ROM version of the mag as well as the standard HD edition. The CD has even more demos and shareware, including huge programs, which we could never fit on a floppy disk. It's hard to find though, so why not guarantee your copy by subscribing? As well as all the usual benefits, CD-ROM subscribers also save money. Instead of paying the normal CD cover price of £4.95, subscribers can get 12 issues for just £47 – a saving over £1 each month!

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Flying Nightmares

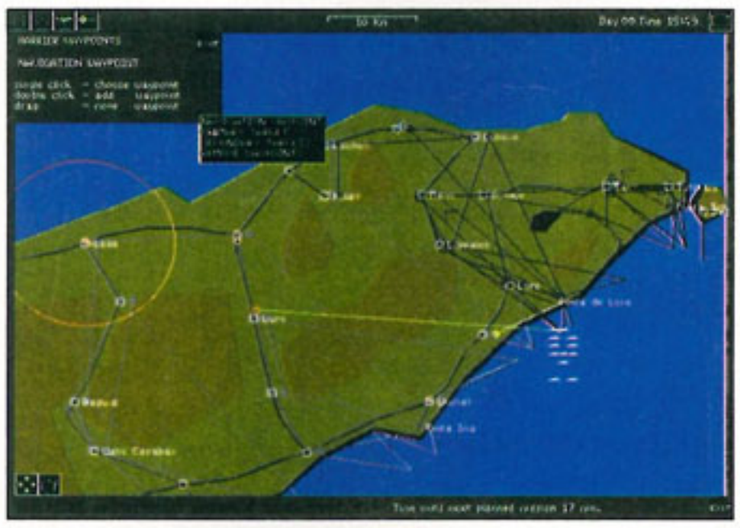
What's this? A convincing flight sim with a powerful strategy element? Put on your goggles, Biggles – we're taking this bird for a spin...

When you play a fantasy game, you normally expect to be hacking orcs and cacodemons with your Mithral Sword of Omens while rescuing Princess Hermione from the clutches of a Satanic sorcerer. Strange, then, that *Flying Nightmares* should give you a scenario more fantastic than anything a Dungeons & Dragons addict could ever dream up. The game is set sometime in the hazy future when – and this is the fantastic bit – the UN has decided to enforce the numerous resolutions it passed following Indonesia's invasion of East Timor.

No, I hadn't heard of it until I played *Flying Nightmares* either, but back in 1975, Indonesian troops invaded the former Portuguese colony of East Timor, murdering merrily as they went, until it was eventually absorbed into Indonesia in May 1976. Human rights abuses followed – in fact, some groups estimate that more than 200,000 East Timorese have been killed since the invasion – and despite several UN resolutions instructing the Indonesians to leave, nothing has been done. Cynics might say that the East Timorese shouldn't expect international assistance, because they don't have any oil, but then that wasn't the only reason that the United States so valiantly defended the oppressive regime in Kuwait, was it?

Anyway, help has finally arrived, and it comes in the form of you – you and a rather sizeable UN task force consisting of an aircraft carrier (the Tarawa) and a varied assortment of support ships, troop ships, landing craft and tanks. Oh, and a couple of dozen AV8B Harriers (as built by British Aerospace and McDonnell-Douglas, and flown by airforces the world over). The great advantage of having the Harrier is that it's an awesome dual-role fighter bomber, which is capable of holding its own in a dog-fight and more than capable of devastating ground installations with its array of air-to-ground rockets, missiles and bombs.

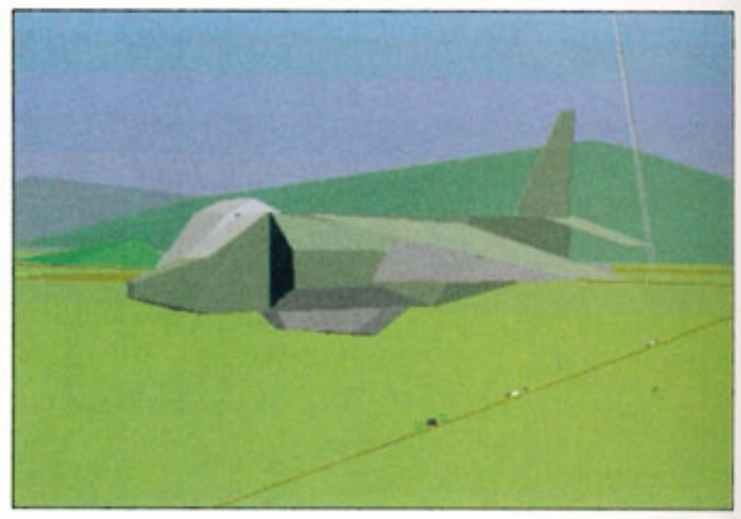
OK, so that's the background, but what's it like when you're up in the air? In a word, smooth. In two words, delectably smooth. In several other words, so smooth that you'll initially find it hard to control the Harrier, because it glides around the sky at the merest stroke of a button or push of the joystick. The Harriers in *Flying Nightmares* are an absolute joy to fly, whether screaming along over trees, tents and



Your aircraft carrier's sophisticated computer system gives you complete control over the task force's strategy.

ground troops at 500 feet or looping the loop in a furious dog-fight above the polygon mountains. The plane takes note of even the most minute flight adjustment, which makes it ideal for lining up precise attack runs with dumb-fire Hydra rockets or free-fall bombs.

Once you've recovered from the shock of how smooth it is, it's time to get to grips with



From the external view you can see your troops heading up the road, while your target smokes in the background.

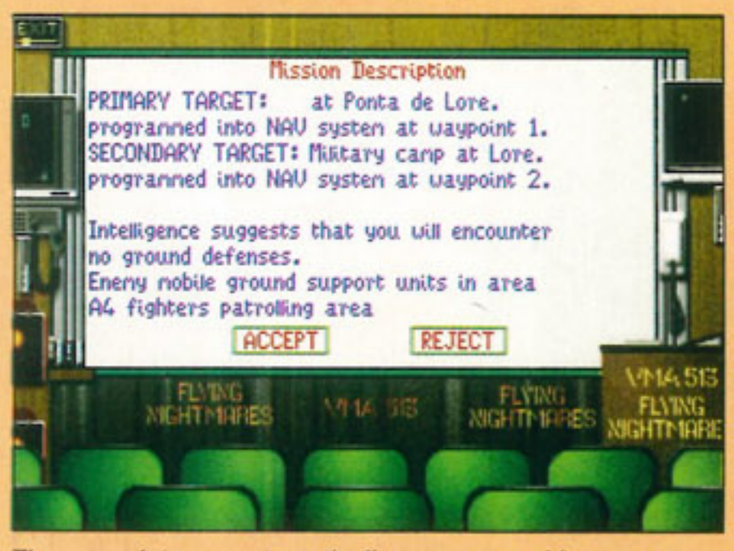
the Harrier's controls – a task best done in the on-ship simulator, if you don't want to waste real planes in the thick of battle. You can gradually ease yourself into the swing of things by adjusting the flight model to suit your ability and experience. For example, you can turn off the G-force effects, so you don't black-out when you pull a sharp turn.

It won't be long, however, before you're performing vertical takeoffs and landings with the best of them, and viffing will become second nature. Viffing? Yes, glad you asked. Viffing – or Vectoring In Forward Flight as it's less commonly known – enables the Harrier to perform complex aerial manoeuvres which make up for its lack of speed. The Harrier has thrust nozzles which can be rotated through 100 degrees; such a rotation will suddenly reduce the plane's speed and cause any enemies on your tail to shoot past, leaving them open to a backside burning attack from your Sidewinders. Good, eh?

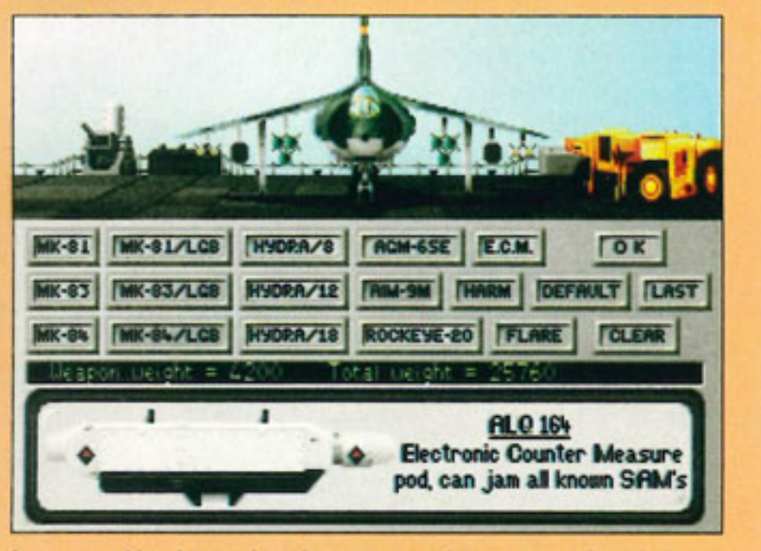
By now you've got used to the plane's handling, tested the variety of air-to-ground ordnance, and shot down more enemy jets in the simulator than you care to remember, so what's next? Ah, just a small matter of the liberation of East Timor. After all, that is why we're here.

MISSION THAT'S NOT AT ALL IMPOSSIBLE

A few hours into the campaign, and there's some serious bombing to be done. Load up the MK-82s and away you go.



The waypoints are automatically programmed into your plane's on-board computer, which is linked to the autopilot.



Arm your Harrier and make sure you leave room for vital defences, such as ECMs, chaff and flares.

The primary target is a small group of enemy vehicles. Loose off a couple of hydras and they're history.

YOUR ARSENAL

You can take your pick from an wide range of explosive weaponry, but your choice of hardware should be influenced by your mission's targets. Here's a selection of what's on offer.

Rockeye Mk20
Delightful little cluster bomb for use against enemy tanks and personnel.

Hydra
These unguided rockets are fired four at a time, which makes them ideal for strafing runs.

Mk-83 Paveway
Laser-guided bomb, which goes straight for targets that you designate from your cockpit.

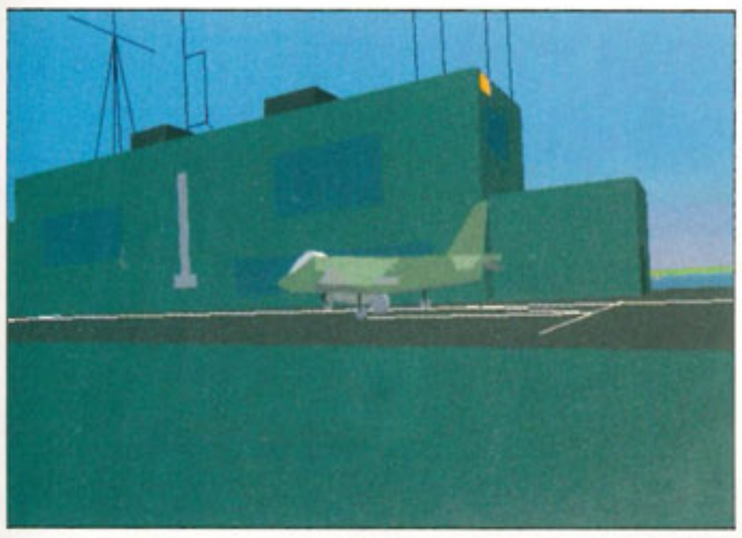
AGM-88 HARM
An anti-radiation missile that's designed to home in on and destroy enemy radar.

Mk-83 Iron Bomb
A free-fall bomb which you have to aim manually. The staple of many an attack.

AGM-65E Maverick
This fire-and-forget, laser-guided bomb has a huge range, but you can only carry a couple of them.

AIM-9M Sidewinder
The trusty air-to-air, heat-seeking missile – there's simply none better.

From the command centre on the Tarawa, you operate a sophisticated computer system that goes by the name of TAWADS (that's Tactical Amphibious Warfare Data System, acronym fans). This enables you to create your own battle plan or fight through a pre-set campaign called Operation SABER. The TAWADS map gives you an overview of East Timor, with the task force and all known enemy locations



On to the deck of the Tarawa, where the Harrier is ready for take off. Hit full throttle, release the brakes and away you go.

marked on it. The task force follows the orders laid down in Operation SABER, and you have the opportunity to take part in every aerial mission or, if you prefer, you can let your Mac pilot the plane for you.

As you fly more and more missions, and the hours and days tick by, your ships sail down the coast to land troops on the shore. Your missions are designed to prepare the ground for the foot soldiers, so ideally their chances of success should be greatly enhanced if you take the plane's controls. But, unless you've spent a good few hours in the simulator, you'll be more of a hindrance than a help. You're not restricted to the planned missions, however – if at any time you see the opportunity for a quick strike, you can take it.

The enemy troops don't just sit around waiting for your guys to walk all over them, though. Oh no. They organise convoys of supplies to rebuild their positions. If you check the map, you'll see the convoy trundling along the road, but click the button a few times and you can designate it as a waypoint for an impromptu mission. Then you just climb inside your Harrier, switch on the autopilot and a couple of minutes later you'll be buzzing the convoy as it drives down the open road. That'll teach them to be more careful in future.

Flying Nightmares takes Macintosh flight sims several steps further in several directions. The strategy section is almost worthy of being a game in its own right, but at the same time its detail doesn't detract from the flight sim gameplay – rather it enhances it. There's nothing more satisfying than flying a successful bombing sortie to take out enemy opposition around a town, and then flying a reconnaissance sortie a couple of hours later to see your ground troops successfully take on the remaining Indonesian aggressors. By the time you make it back to the aircraft carrier, the town has been won and you're in control of another part of East Timor.

But even if you ignore the strategy side, as a flight sim it reigns supreme in the world of the Mac – it certainly blows the afterburners off *Hellcats* and *Chuck Yeager*. You need a Quadra or PowerMac to get the most out of it, but at last there's a game that exploits the power of the machine you forked out so much money for. A must for flight sim fans, and worthy of serious consideration by anyone who hasn't dabbled in the genre before. *Richard Longhurst*

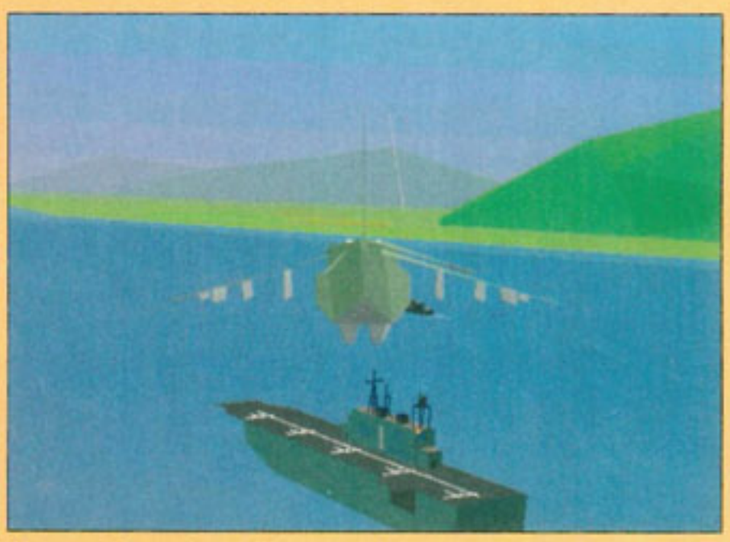
FLYING NIGHTMARES

Price: £29.99. Out: now
Requires: LC or better, 4Mb of RAM (8Mb recommended), 256-colour monitor. PowerMac or Quadra strongly recommended.
For more details contact Domark on 081 780 2222.

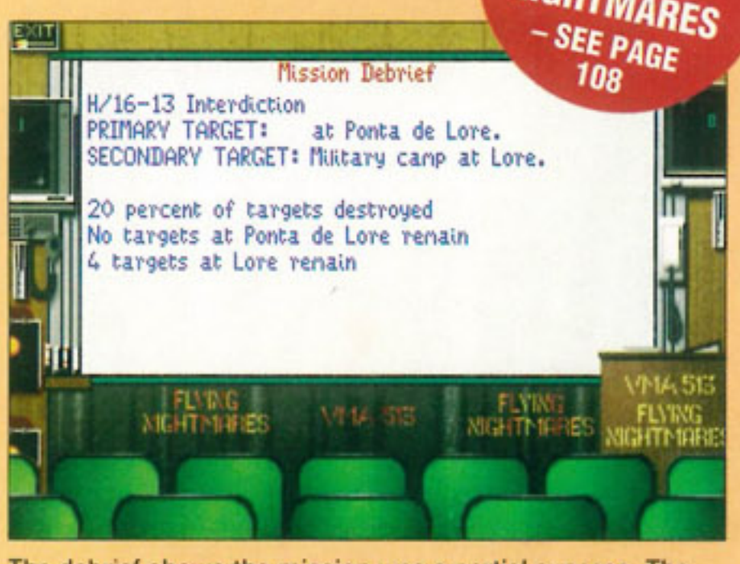
Graphics Beautifully smooth and well detailed.	88%
Sound Great on a PowerMac, limited on a Quadra.	84%
Gameplay The absolute business, both as a strategy game and as a sim. And cheap too.	92%
MACFORMAT RATING	93%

WIN A COPY OF FLYING NIGHTMARES – SEE PAGE 108

And then it's on to the secondary waypoint, where aircaft hangers are waiting to be bombed into oblivion.



Hit autopilot and you'll be taken back to the Tarawa, where you get the chance to admire your destructive genius.



The debrief shows the mission was a partial success. The primary target is gone, but you'll need to revisit the camp.

LOOK WHO'S COMING FOR DINNER...

Oh no, everybody has forgotten to turn up for dinner. Oh well, more food for the rest of us.

Click on the table and ghostly apparitions appear, acting out their last supper.

To complete the puzzle on the table, you have to divide it into equal pieces. It's trickier than it looks.

The 7th Guest

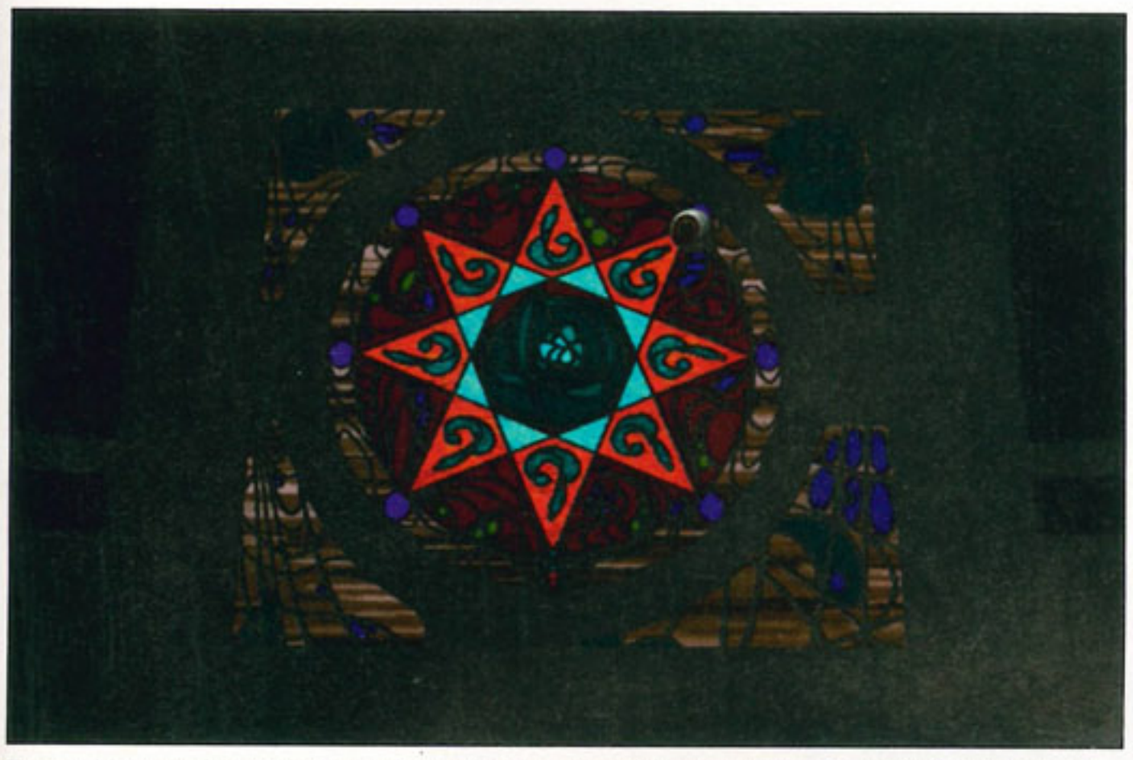
Scared yet? No, of course you're not, but you will be – especially if you've got a CD-ROM drive.

Inside Stauf's mansion, you stand at the foot of the foreboding staircase, worried about the horrors that lie within the house. But before the doors upstairs open, you have to solve several puzzles on the ground floor.

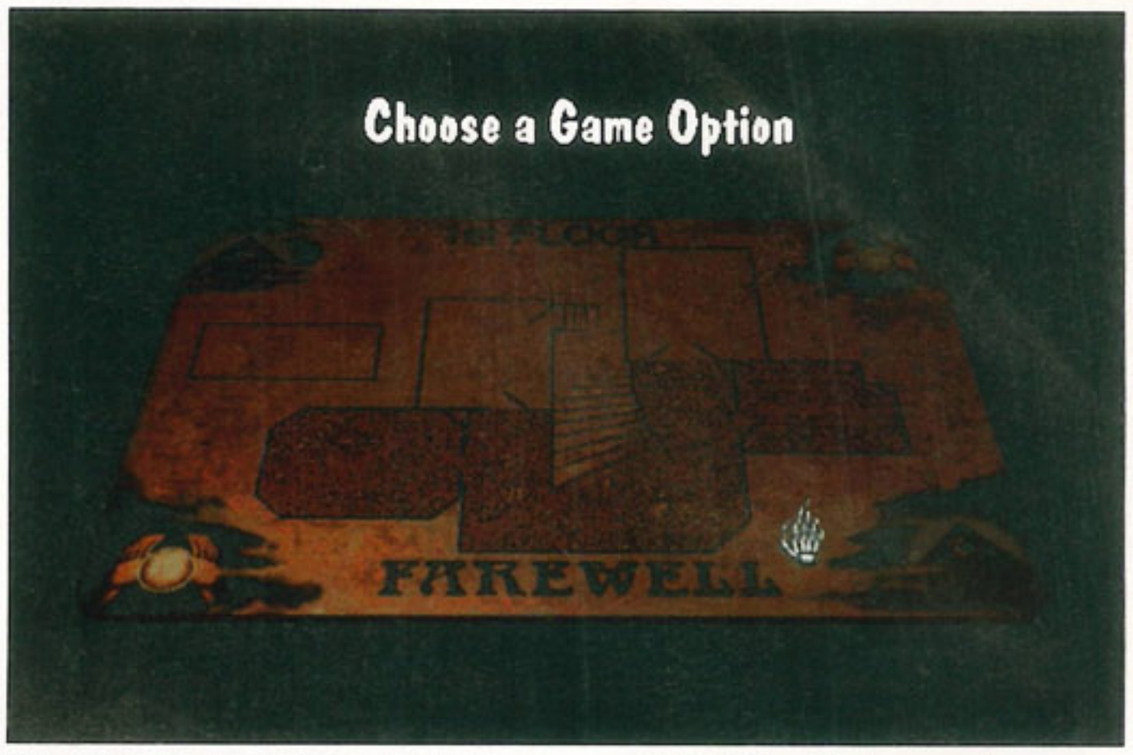
At last an adult game. Not adult in a Benny Hill 'fnarr-fnarr', smutty sex kind of way, but in a tense, psychological thriller kind of way. *The 7th Guest* is one of the few games that has a challenging, even scary storyline; it also has visuals, speech and sounds to add to the effect. Computer games in general, and Mac games in particular, no longer need to be seen as the domain of teenagers. You certainly can't imagine 13 year old Jules reviewing Virgin's haunted house adventure on the BBC's computer programme, *The Net*. Her bubbly style just wouldn't fit alongside the macabre happenings in *The 7th Guest* – and besides, it's one of the few games that comes with a voluntary recommendation informing you that it's not suitable for anyone under the age of 17.

It's definitely not the kind of plot you expect to find in a computer game: Stauf, a drifter turned granny-basher, turns his hand to toy-making and rakes in an absolute fortune, which he then uses to build a huge puzzle-filled house atop a nearby hill. The only trouble is that all the children who own his toys die painful deaths, which doesn't bode well for the six guests who have been invited to spend a weekend at his luxurious residence. Six guests? What of the eponymous seventh? Ah, to tell you that would be to spoil the story, but don't fret, you'll find out all about it when you play the game.

After the lengthy scene-setting intro sequence, you find yourself at the foot of the



Those tricky game designers have even managed to squeeze in a puzzle on the large stained-glass front door, but can you work out what the point is?



If you get lost, you can always consult the map – except that it doesn't show you where you are. Never mind, it doesn't tell you what you're supposed to be doing, either.

stairs in Stauf's hallway. Moving a skeletal hand around the screen shows you where you can walk, either to the left or right, or pointing into the screen. Click the button and you're taken along a pre-rendered path to the next decision point. This stop-start movement gives you ample time to admire the incredibly detailed rendered graphics, but you always feel restricted by it. There's no freedom of movement to go where you want – you simply have to follow the pre-determined paths, which can get rather tedious on a slow Mac.

At the start of the game, you don't have access to all the rooms, but you can unlock the doors by solving the numerous logic puzzles scattered throughout the house. This is essentially what the game's all about – pitting your wits against Stauf's to open up the doors and gradually find out what's been going on in this murderous hell-hole. (Oops, almost gave a bit of the plot away there – must be more careful in future.)

There are plenty of puzzles to test the old grey matter, but it's not simply a case of following the instructions, because there aren't any. You have to find out the rules for yourself, while Stauf's disembodied voice taunts you in the background. A good dose of trial and error is all that's needed for you to work out how to play a puzzle, but some of them are fiendishly difficult to solve. Luckily there's a clue book in the library, but if you use too many clues, you get penalised later in the game.

After you complete each puzzle, you're treated to a short video sequence – which is laid over the rendered location – featuring ghostly apparitions of the guests talking about their motives for coming to the house. Slowly it all begins to make sense, but because you choose the order in which you want to tackle the puzzles, you effectively determine the order in which various parts of the plot are revealed. This makes an already confusing storyline even more perplexing. It does add to the game's mystery, but you can't help feeling that the designers should have maintained a tighter control over the story. After all, they've restricted your movements around the house to a large degree, so why not control what you discover and when you discover it?

To a certain extent, what the game is trying to achieve is more important than how it plays. It's an ambitious attempt to create a truly horrifying adult game using some of the most sophisticated graphics techniques around. We've got sports games, shoot-'em-ups and space-based adventures coming out of our ears, but here, at last, is a game that offers something new. Its bold storyline challenges us in the same way as David Lynch's surreal *Twin Peaks*: you don't know what's going on, but you're bloody determined to find out.

In terms of gameplay, *The 7th Guest* is little more than a collection of puzzles strung together with some fancy graphics and an off-the-wall psycho killer storyline. It's very much a triumph of style over content, but it's been so lovingly created that you can just about forgive the limited level of interaction. The wonderfully detailed rendered rooms, the spooky music and the grisly storyline combine to create a marvellously atmospheric game – and if you've got a CD-ROM drive, you'd be a fool not to play it.

Richard Longhurst

THE 7TH GUEST

Price: £49.99. Out: now.
Requires: LCII or better running at 20MHz or higher. System 7 or higher. 4Mb of RAM and 10Mb of hard disk space. 256-colour display and a CD-ROM drive.
Controls: mouse.
For more details contact Virgin on 081 960 2255.

Graphics 90%
As far as rendering goes, this is the tops.

Sound 88%
CD-quality music and speech, with some ghoulish sound effects.

Gameplay 75%
The puzzles are fun, but it could do with more character interaction.

MACFORMAT RATING 84%

PATRICK MOORE WOULD LOVE THIS (WE THINK)

You'll find a clue book in the library, but there's something much more interesting down the other end of the room.

See? It's a telescope. That's far more interesting than a boring book, isn't it?

Look through it and you get a great view of Stauf's neighbour undressing, disguised as a puzzle, of course.

Deliverance

At last, a console-style game where you can hack, slash and wang (?) to your heart's content.

Lionel searches the cupboard, but can't find anything to match his designer loincloth and Viking helmet.

The grass, as they say, is always greener on the other side. Talk to an average Super Nintendo owner (and let's face it, most of them are pretty average), and you'll undoubtedly be told that the stream of platform games which are constantly being released for the console market are more than a little dull. Yet over in Mac land, it's a different story. Ask a Mac owner what game genre he'd like to see more of, and what pops up? Yeah, you got it – the platform game.

By an uncanny coincidence, *Deliverance* is a platformer which bravely attempts to accurately reproduce a SNES-style hack-'em-up on the Mac. That's right, the machine that can run entire publishing systems, but can't seem to cope with moving a few sprites around the screen, has a new platformer. And it almost works.

The hero of *Deliverance* is a muscly chap by the name of... well, let's call him Lionel – it's no sillier than his real name. Lionel has been ensnared in a large castle by Something One, and must battle through the intricate maze-like levels to reach Something Two, thereby preventing Something One from taking over Something Three. (Fill in your own details.)

In practice, this entails much jumping, slashing and searching out of keys. Lionel's a fine figure of a sprite, who possesses an infinite number of axes to wang at the creatures in the castle. He can wang 'em up; he can wang 'em down; he can, in fact, wang 'em straight ahead. And, at times of stress, he can stand still and slash violently in every direction, dicing anything that dares to approach. And approach they do.

Unpleasant spiders crawl along the floors and up walls; bats flap out of cupboards; and

A 30 foot maiden contemplates the heroic Lionel – and the problems of the castle's central heating system. Probably.

mutant beasts swing expertly around the platforms. In the later levels, these beasties start ganging up on you and it all gets rather hectic as you attempt to fend off energy-sapping monsters from every direction. Great stuff.

In between the wanging, running and jumping, it's a good idea to open every cupboard you encounter. If you're lucky, it'll contain a key, enabling you to progress beyond the locked doors. Cupboards can also hold fairies – the collection of which provokes a girlish giggle (not from Lionel – he's not that sort of chap) – or more nasties. The game involves a lot of exploration, so it's good idea to keep track of where you've been by dropping opal beacons; unfortunately, this saps some of your energy. This can be recouped, however, by collecting the coins which slain nasties leave behind or just by standing around for a bit doing nothing.

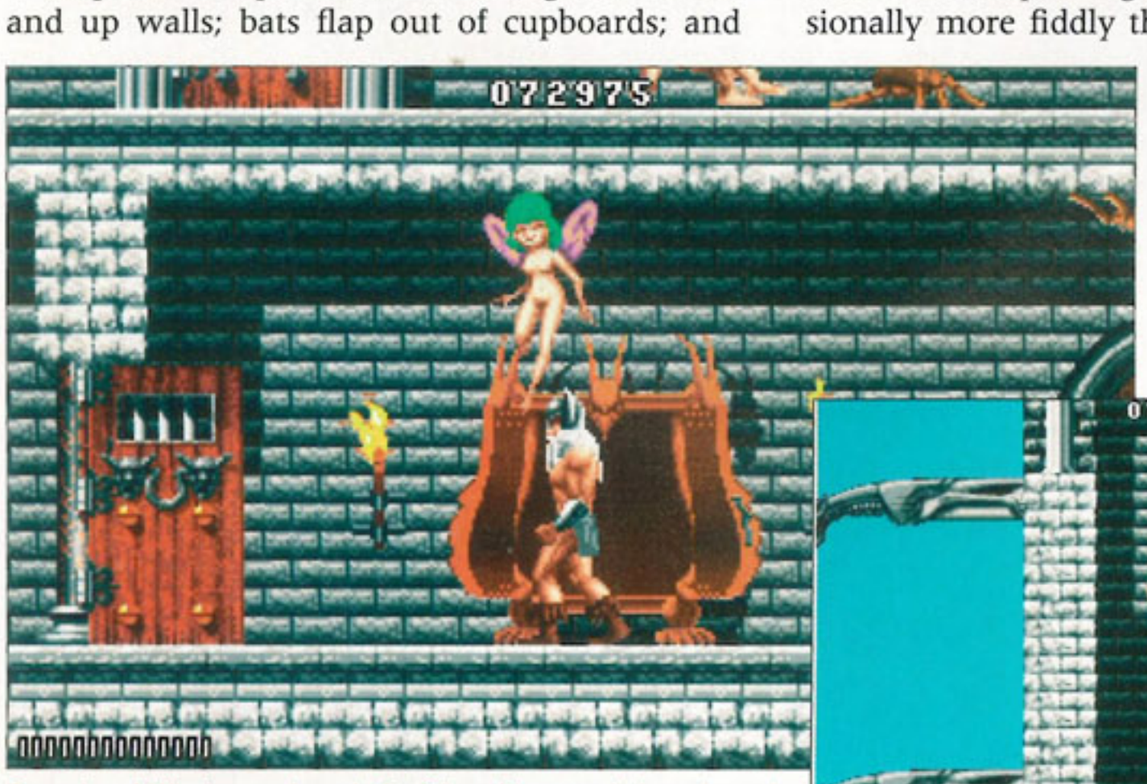
Controlling Lionel is annoying sometimes. He has a tendency to fall off ladders at the slightest touch of a key and gauging the jumps is occasionally more fiddly than it should be. He tries hard, though, grunting and roaring manfully as he grazes his knees on a ledge – again.

You've got the choice of running the game either full-screen, in a window, or in full-screen 'fast mode'. With a full-screen view, the scrolling's a tad jerky even on fast machines, but not bad enough to ruin the flow, and it's infinitely preferable to the less-pixellated but tiny window mode. In 'fast mode' every other scan-line of the display is left out, so the game runs faster, but looks horribly striped. Whichever mode you're in, the game shifts adequately enough to keep the adrenaline flowing. The animation is well up to scratch, as are the sound samples.

Deliverance certainly delivers in most areas. It's got the graphics, it's got the challenge (plenty of devious levels, each with guardians) and it's addictive enough to keep you coming back for more. It's a console game for the Mac, plain and simple – or at least, as close to it as you'll get: nothing complicated and no fuss – just good, unclean fun.

Ed Ricketts

Look out, Lionel – he's beneath you! The castle's mutant beasties attack from the most unexpected directions.



Be serious! Who's ever heard of a fairy with green hair and purple wings? Everyone knows they have white wings and blonde hair.

The controls can be a bit finicky, so you have to be extra careful when climbing ladders.

DELIVERANCE

Price: £39.99.
Requires: any colour Mac running system 6.0.7 or later.
Controls: keyboard, Macfly.
For more details contact Softline on 081 401 0058.

Graphics Looks good, but scrolls badly.	80%
Sound Ow! Oof! Nyaargh!	73%
Gameplay Just one more go...	79%
MACFORMAT RATING	80%

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Populous 2

Be a god for a day. Or a week, more like. Or a month. Or two months... Oh hell, why not just take over the world?

As the name suggests, *Populous 2* is *Populous*, only doubly so. Anyone who's ever played *Populous* will have absolutely no trouble in working out how to play it, because it's basically the same game with just a few frills tacked on top. And everyone's played *Populous* – it's one of the most famous games in the world – so there's really no point in explaining how it works.

Oh, all right then. You're a god and your domain is a square of 3D landscape. Or, at least, half a square of 3D landscape. You see, there's another god, controlled by your Mac, whom you've got to battle for supremacy. When the game starts, you've each got a population of about five little people, which you have to nurture until, with a little luck, they reproduce and become strong enough to overwhelm the other side.

The first thing you've got to do is create some flat areas of land so your people can build settlements; the bigger these areas of land are, the bigger the settlements will be. So, while a cleared plateau gives rise to huge castles, stepped or uneven land is dotted with tiny tents. Once a settlement's been built, it slowly starts to fill up with people until, eventually, it overflows and a new little person pops out to establish a settlement of his own. And so it goes on, with both populations expanding until they finally bump into each other and start fighting.

There are various ways you can influence your people to get the best results out of them. You can get them to concentrate on building new settlements while ignoring the enemy population. You can make them aggressive, so they attack any enemy people or settlements they come across. You can get them to search for each other and join together to make super-people. And you've also got something called a Papal Magnet, which you can place anywhere on the landscape – in the middle of an enemy settlement, for example, or in an area of land you'd like your guys to populate – and then instruct your people to head for it.

Divine intervention...

All this is jolly good fun in itself. Moulding and tweaking the landscape is a curiously therapeutic process. In fact, it's a bit like one of those 1980s executive toys with the magnet and the little bits of metal.

But where the game really hots up – and where *Populous 2* improves massively upon the original – is in the 'natural' disasters you can invoke to speed the other side's demise. *Populous* gave you (racks his brain desperately) about eight of these, which covered basic acts of god like floods, earthquakes and swamps, but they weren't really a great deal of use beyond looking nice. (Except the flood, which caught the computer out every time.) In *Populous 2*, however, acts of divine intervention are an intrinsic part of the game; you really have to use them if you're going to win.

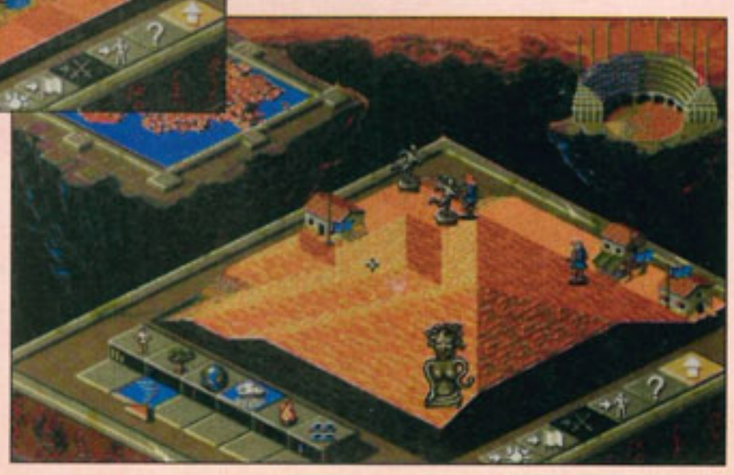
These godly acts fall into five main categories: Vegetation Effects, including swamps and a fungus which spreads across the enemy's land; Earth Effects, including earthquakes (and the like), plus roads and walls which serve to protect your people; Air Effects, including lightning, whirlwinds, storms and hurricanes; Fire Effects, including fire rain and volcanoes; and Water Effects, such as tidal waves, whirlpools and – a good one, this – baptismal fonts which change baddies into goodies and vice versa, enabling you to start minor civil wars. Only certain effects are available on each level though, and you've got to wait until your Mana or power (roughly equivalent to the area of land your population occupies) reaches a certain point before you can use them.

In addition to all this, you've also got heroes. These are like the knights in the original *Populous*: they're created by appointing a leader for your population (by getting one of your people

Merciless gods

At arbitrary points during the game, other gods will appear and march across the landscape, wreaking havoc as they go. So, if you hear people screaming in the distance, act fast.

Neptune swims everywhere. If there's no water, he makes some.



Medusa turns people into stone. By looking at them. This is especially bad if she goes through a heavily populated area.

This dragon phoenix-type beastie breathes fire everywhere, toasting settlements and settlers as he goes.

And this fellow stamps along, leaving a perilous ravine in his wake.

EVERYBODY WANTS TO RULE THE WORLD!

to walk into the Papal Magnet), making him as powerful as possible (by getting lots of other people to join up with him), then clicking on the icon of your choice, whereupon he'll head off towards the nearest group of baddies and hack them to pieces.

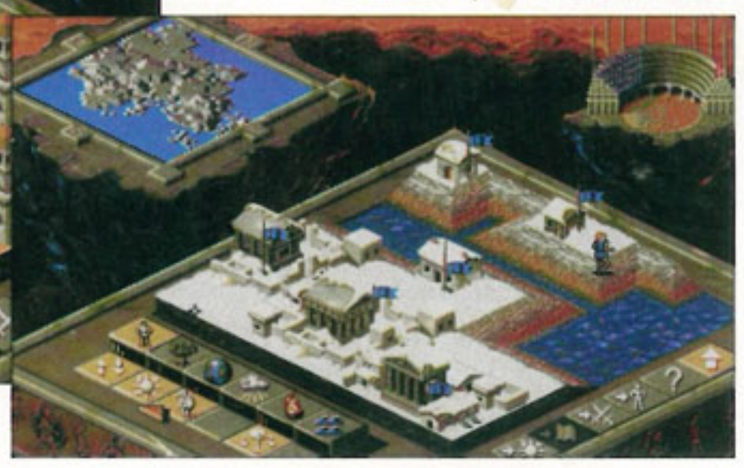
Just how he goes about this gruesome task, however, depends on which hero you choose; there's one for each range of disasters. Adonis, for instance, divides into two after each conflict, thereby causing widespread, if rather short-lived, havoc. Then there's Hercules, who's really strong; Odysseus, who moves very fast; Achilles, who sets fire to things; Helen of Troy, who leads your enemy into the sea; and Perseus, who's good at avoiding traps.

And there's loads more to *Populous 2*, but this is beginning to sound horribly like an instruction manual. So – is *Populous 2* any good? Or what? Well, yes. It's great, basically. If you've played *Populous*, then it's like that, except the gradual introduction of new disasters means you avoid the feeling that you've seen it all after just a couple of levels. And if you haven't played *Populous*... well, let's just say it's one of those games that you can quite easily play until four o'clock in the morning – and not even notice it. It really is incredibly compulsive.

The only slight nagging doubt I have is one that applies to the original *Populous*, as well. The game's spread over 1,000 (1,000!) levels and, although you don't have to play them all (you jump anything up to 20 levels at a time depending on how well you do), they do produce a very strange difficulty curve. Your Mac doesn't really put up any kind of a fight for the first hundred levels or so, and after a while, beating it becomes a simple, routine matter. And yet, bizarrely, when the computer does start to pull its weight (after several days of continuous, bleary-eyed playing), the game suddenly becomes incredibly hard, and all the fun seems to go out of it. It's an odd problem, but as long as it stays nagging away in the background, it can't be considered a serious one.

I'm not sure I could unreservedly recommend *Populous 2* to owners of the original – it's really more of an upgrade than a completely new game, and there's only so much land-lowering-and-raising a person can take – but for everyone else it's absolutely essential. Don't even consider not buying it. *Jonathan Davies*

There are various different sorts of scenery. This is the snow-bound sort. Although you can probably see that for yourself.



City walls are a fine way to protect your settlements. They also look rather splendid, so build lots of them.

Price: £39.99.
Requires: seems to run on anything from a Classic upwards. Controls: mouse.
For more details contact: Electronic Arts on 0753 549442.

Graphics 90%
Intricately detailed. It really does look like you've got a whole world inside your Mac.

Sound 70%
Good use of effects to let you know what's going on, but overall a little creaky.

Gameplay 95%
Unbeatable. It's impossible to stop playing – there's just no arguing with it.

MACFORMAT RATING 94%

Spaceship Warlock

Can you cut it as an interstellar buccaneer? Let's hope so, eh, for your own sake...

Spaceship Warlock is an 'interactive movie' – the sort of thing CD-ROM cynics love to hate, with lengthy chunks of sit-back-and-watch video footage, not a great deal of interaction on the player's part, and, if you do the right things at the right times, a strictly predetermined outcome. Within those limits, though, it's not bad.

You start *Spaceship Warlock* standing in the middle of a city street on the planet Stambul, a setting which might best be described as a blend of *Blade Runner* and the futuristic bit of *Back to the Future II*. Neon signs flash alien messages at you and hover cars buzz overhead. After walking around a bit, you run into a bug-eyed mugger, who demands either your money or your life. You haven't got any money and, although it's a little dull at times, you're rather fond of your life, so you take a couple of swings at the fellow and he collapses to the ground senseless. He turns out to be a wanted criminal called Hok Tuey with a 10,000 credit reward on his head but, despite handing over the money, the police suggest that you're not exactly welcome on Stambul. Hmm, you think, maybe it'd be an idea to hop on a spaceliner to another planet. (Or if you don't, the manual spells it out in its rather heavy-handed hints section.) So you do, but the liner gets hijacked by pirates who force you to work for them, except you outwit them and escape, and so on.

And this is the shuttle you catch to rendezvous with the Belshazzar. Note the pleasantly retro styling.

You navigate around the game by clicking on the right of the screen to turn 90 degrees clockwise, the left of the screen to turn anti-clockwise and the middle to walk forwards. When you do so, the view fades out to be replaced a short while later by the view of your new location – no smooth 3D animation here. Other forms of interaction crop up occasionally: you can click on lockers to open them, for example, or on people's faces to talk to or punch them – it all depends on what the game decides is appropriate. You can have limited conversations with people by typing in sentences and hoping they recognise the odd word here and there – which works surprisingly well – and you can occasionally pick up objects, then use them later on. And that's really about it.

Welcome to the the planet Stambul, a world of skyscrapers, bug-eyed monsters and a really nice pink sky.

Spaceship Warlock is helped along by some nifty computer-generated animation sequences and interesting *Dan Dare* retro-style spaceships. And it's entertaining enough to play, with one or two amusing diversions from the story's main thread. But if you stick to the beaten track (and that hints section doesn't leave much to the imagination), I reckon you could play the game through from start to finish in a couple of hours, and after that you'd never want to look at it again. Which sounds like a pretty raw deal for £45. *Jonathan Davies*

SPACESHIP WARLOCK

Price: £45. Out: now
Requires: a 13-inch 256-colour monitor, System 6.0.2 or later, 4Mb of RAM and a CD-ROM drive.
Controls: mouse.
For more details contact: Visual Media Systems/UBI Soft on 081 343 9055.

Graphics 82%
Solid throughout, with the occasional moment of inspiration. Excellent overall atmosphere.

Sound 80%
CD-quality (natch). The theme tune is undoubtedly the most dismal ever written.

Gameplay 55%
Er... N/A? No, um, there isn't much, to be honest. It's not that sort of game.

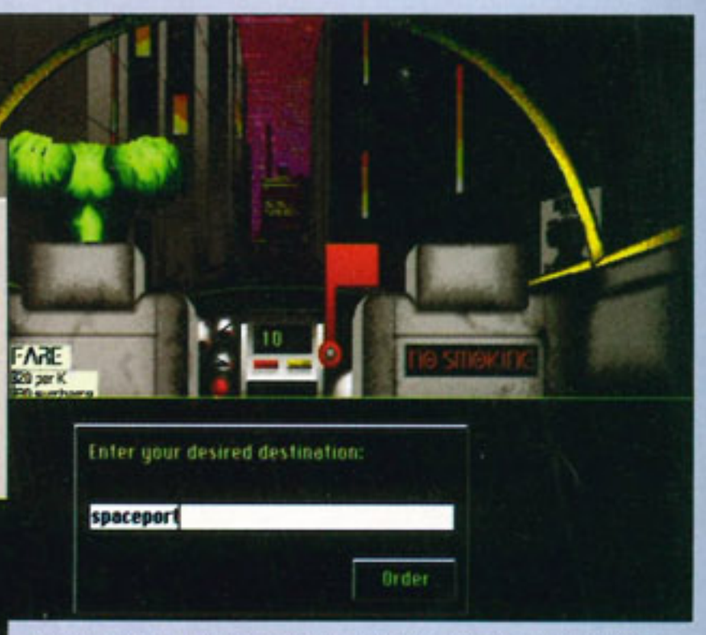
MACFORMAT RATING 69%

GETTING STARTED AS A BUCCANEER

Spaceship Warlock, a pioneer of its time, first appeared a couple of years ago. It has now been officially released in the UK – nostalgia fans, take note. You begin the game with the few steps illustrated below, but what it boils down to is choosing the right options at the right time.

This fellow is Hok Tuey. Hit him a few times to get the 10,000 credit reward riding on his frankly ugly head.

Buy a ticket for the Belshazzar from one of these video-phones. You can get the number from 'Information'.



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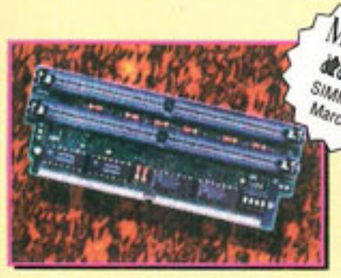

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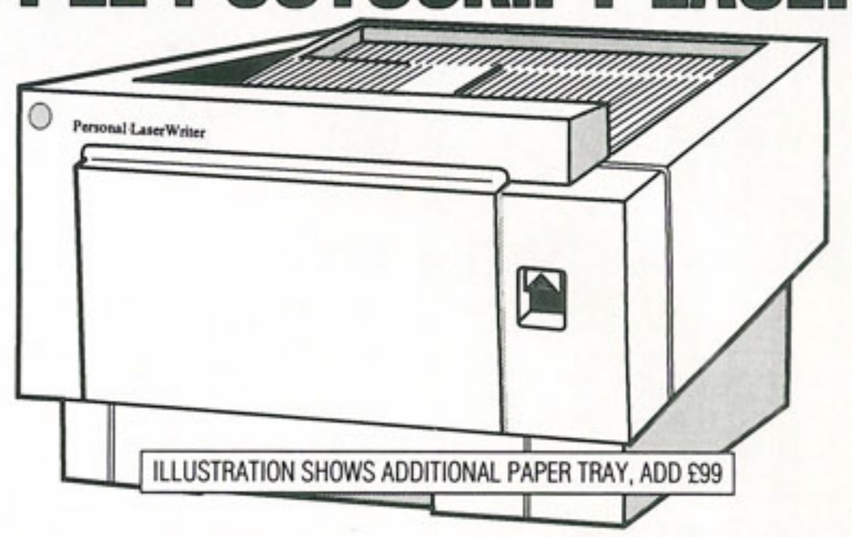

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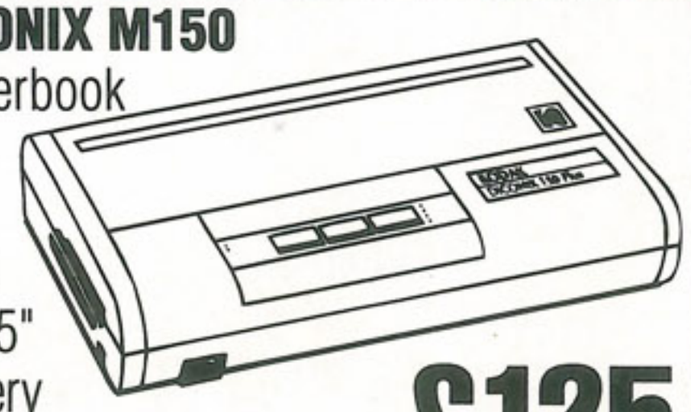

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■ StyleWriter I printer, boxed with manuals £150 ono. Phone 0553 841956 (Norfolk)
■ 2Mb Simms (LCII) £75 ono. Phone 031 343 3448 after 6pm.
■ StyleWriter InkJet printer, home use only. Excellent condition £200 ono. Phone 0324 484520 Central Scotland (evenings)
■ HP DeskWriter InkJet printer, new, unused, boxed, manuals, software, unopened. Offers. Phone 0932 356470
■ GCC PLP II Laser printer, automatic cassette feed, SCSI interface cable, bought in error for PC, printer driver. Software, all manuals, boxed, as new £350. Phone 081 470 8787 (London)
■ PalmTop MicroWriter Agenda Computer. Includes Macintosh software and leads, programming kit (PC), case, manuals, printer connection. Serves as word processor, personal organiser and much more. Phone 081 767 5352
■ Paper tray for LaserWriter II also 14" colour monitor. Phone Asif 061 273 5704
■ Performa Plus 14" colour monitor in box, unopened, 1 year warranty £150. Phone Richard 081 806 1682 North London (days)
■ Sigma "Power Portrait" monitor – A4 mono display inc. stand. For any type of Mac. No card etc. needed. Boxed, home use only £400. Phone 0203 673963 Coventry
■ HP DeskWriter 550C colour printer, hardly used. Pristine condition. Boxed as new. Cable, colour cartridges. 3 years warranty £395. Postscript Interpreter option + £50. Phone 081 896 2425
■ PSI Comstation One fax/modem. Six months old, home use only. Lots of PD software for connection to BBS and Internet £85. Phone Robert 081 941 7746
■ Quadra 610 12/160 16" colour monitor, hardly used £2200. PowerBook 100 4/40 PSI fax modem, optical mouse, £650. LaserWriter LS £390. Epson GT-6500 scanner, unused, £650. Mirror SyQuest 44, two cartridges, £320. Phone 0284 762212
■ HP Deskwriter 310, colour, 1 month old, £250. *Claris Works 2.1*, £50. Tel: 0292 314127.
■ 40Mb internal hard disk from Mac LC. One year old, £45. Tel: 081 390 0582, Surbiton.
■ 4 x 1Meg, 64 pin SIMMS for Mac 11FX or NT laser, £60 for the lot. Also wanted black SCSI terminator for Mac11FX. Tel: Richard on 0480 300409, St Ives.
■ Tamarack 24 bit full colour desktop scanner with tranny hood. As new, including *Photoshop*, £1100. Tel: 0704 831854.
■ 2 x 1Mb SIMMS for LC (30 pin), £40, with wrist grounding strap. Tel: 031 343 3448, after 6.00pm.
■ Supra Fax Modem Plus. V42bis, FaxSTF, ZTerm, Microphone LT. Very good condition. 6 months old, £100 or offers. Tel: Tim Allen on 0322 669211, daytime or 0322 275755, evenings.
■ Mac carry bag for sale, yellow madson line padded bag, suitable for Plus, Classic etc. Very good condition, cost £70+, new offers around £35. Tel: 081 892 8564.
■ Global teleport ADB Fax Modem, £50. Macrecorder Audio Digitizer, Microphone faulty, but line input okay, hence, £30. Tel: 0344 779886, evenings.
■ Radius 'Precision Colour' 8x graphic accelerator card, brand new, unused and warrenty. Only £200. Tel: 081 645 0706.
■ Laser printer Apple Select 320, hardly used, recent purchase, £395, for quick sale. Tel: 0753 623000 or St Albans, 0727 841046.

SWAPS

■ Full version *PhotoShop* 2.5.1 (upgraded) £190 (will swap for WACOM tablet). *PageMaker* 5.0 (registered) £250 ono. Genuine sale
Phone Claire or Gavin 081 3938646
■ VRAM: 2X Apple 256K Simms, one month old, swap for 30 pin RAM Simms (older style) or offers. Phone 0203 673963
■ Sim earth £15 or swap for other software. Phone Tom 0902 25762

USER GROUPS

Need hands-on help with a Mac problem? Want to swap shareware or freeware, or just meet other Mac enthusiasts? Try a user group near you...

■ Aston Univ mac UG, Birmingham. Tel: Ray Tier on 021 359 3611.
■ Berkshire Mac User Group meets monthly (on the second Fridayof every month) in the Reading/Newbury/Basingstoke area. Bias towards design/DTP and general interest in solving Mac problems. Ring: 0734 813669. (MF 16)
■ Blackburn Mac UG. Tel: Roger Moreton on 0254 670043.
■ Bournemouth Mac UG. Tel: Barry Cheesman on 0202 715859.
■ Bristol (BAUD). Tel: Malcolm Ingsley on 0454 616846.
■ Cambridge Apple UG. Tel: Ian Archibald on 0223 311157.
■ Cancer Research/RMH UG, Cancer Society/RMH. Tel: Raymond Henry on 081 643 8901 (Bulletin Board x 4636).
■ Edinburgh Apple UG. Tel: John Beatie on 031 554 5096.
■ Gateway UG, Norfolk. Tel: Verne Anderson on 0638 513000.
■ Glasgow Mac UG. Tel: Stephen Broadfoot on 041 339 6646.
■ Herts/Beds Apple UG, Luton. Tel: Norah Arnold on 0582 573918.
■ Hampton Court (Riverside) UG has a new phone number: 081 224 1187. Small, newish group welcomes new enthusiastic members. (MF 16)
■ Highland Mac UG (HIMUG), Scottish Highlands. Tel: Bob Warner 0463 715322.
■ Liverpool Apple UG. Tel: Irene Flaxman on 051 928 4142. Bulletin Board: 051 949 0307.
■ London Macintosh User Group. Facilities include: telephone support for full members, shareware at reduced prices, monthly mag, monthly meetings in London presented by leading hardware and software manufacturers. Full details: 43 Villiers St, London WC2N 6NE. Tel: 071 930 3757. (MF 16)
■ Group of users with a regular newsletter via ICR computing service. Workshops for training, software and hardware support in a PC-dominated environment. Contact Raymond Henry, Haddow Labs, ICR, Sutton SM2 5NG. (MF 16)
■ MacAssist, Cardiff and district. Tel: Nigel Arrighi on 0222 224682.
■ Mac user group. Send large SAE for free newsletter. All levels. Non commercial. Ref MF, 9 Burrill Drive, Wiggington, York YO3 3ST. (MF 16)
■ Macintosh Association of Users in EEC, 4 Chiou, Athens, 15231, Greece. Tel 6725485. Meetings Wednesdays 8–10pm, Saturdays and Sundays 12–2pm. We are a non-profit organisation. Please help us by donating books (misprinted, used; by surface mail), disks, programs, CD-ROMs etc for our library and program for the handicapped. (MF 16)
■ Mactivity International – the biggest user group in Europe. Divisions in Scandinavia, Estonia, Germany, Benelux. The only number we have at the moment is: Belgium Tel. 32 80 64 77 13. (MF 16)
■ Midapple, West Midlands. Tel: William Watson on 0384 277921.
■ Midland Mag UG, Worcestershire. Tel: Ivan Knezovich on 0299 402631.
■ National postal user group. Monthly newsletter on disk. Includes competitions, special offers, reviews, cover disk, etc. Send a self addressed envelope for info to: Mac Shareware User Group (MSUG), 21 Milldown Avenue, Goring-on-Thames, Reading RG8 0AS. (MF 16)
■ North West Apple C.C – Cheshire area, North. Telephone: Mr George Evans on 0270 583714.
■ Nottingham Mac UG. Tel: David Nicholson-Cole on 0602 455077.
■ Poole Mag User Group. Tel: Bob Lister on 0202 684441.
■ SE Essex Mac User Group. Tel: Michael Foy on 0702 468062.
■ Southampton Mac UG. Tel: Geoff Parsons on 0703 2244957.
■ Southern Mac UG, Salisbury and district. Tel: Roger Ford on 0722 780102.
■ Southwest Mac User Group, Bristol. Tel: John Elver on 0272 693119.
■ Staffs Poly Mac UG, Staffordshire. Tel: Mark Stiles on 0785 52331.
■ Stavanger Macintosh User Group was established in 1986 and has over 50 members. It normally has eight meetings a year on various topics. Contact Jan Frick, Chairman, Rogaland University Centre, PO Box 2557, Vllandhaug, N-4004 Stavanger, Norway. (MF 16)
■ Sussex User Group, Hastings, East Sussex. Tel: Garry Nevin on 0424 714110.
■ The Computer Textile Design Group. We are trying to build up a panel of advisors who can help inexperienced computer users with their problems. For more info contact Maggie Dunn, Wynnstay Cottage, Lamin Gap Lane, The Fosse, Cotgrave, Notts NG12 3HG, enclosing an self-addressed envelope for a membership form. (MF 16)
■ The Southwest Macintosh Users Association. Membership is £17 pa, but the first 100 applications will be given founder member status. Contact the Club Secretary, SMUA, Firs, Rackstile, Wadeford, Chard, Somerset TA20 3AP. (MF 16)
■ The United Shareware User Group meet Portuguese Mac users and our Shareware – Pra. Ferreira de Castro 1-3 Dto, Coruaxide 2795, Portugal (MF 19)
■ West Midlands User Group. Tel: Danny Torbica on 0902 336172.
■ Yorks and Humberside Mac UG. Tel: Derek House on 0423 358853.

Your user group will be listed here free of charge for six issues, then deleted to help weed out defunct groups. The number at the end of each entry is the last issue in which that entry will be included. If you want your group's entry renewed (or corrected), just send in the coupon on page 100 a couple of issues in advance. If you run a group which is not listed here, then send us your details!

Note: this list is provided as a free service for amateur, non-profit-making user groups. MACFORMAT does not endorse or recommend any particular group and cannot be held responsible for any losses or problems you might suffer as a result of contacting User Groups advertised here.

Buying advice

Whether you're buying by mail or in person, here are some sensible precautions to bear in mind. Note that everything here applies to buying from a business; most of it does *not* apply to buying from a private seller in MACFORMAT's reader ads pages.

Always be absolutely clear about what is included in the price – postage and packing? Any necessary cables etc? VAT? (By law, an advert must say *explicitly* if VAT is not included; if it doesn't, VAT *is* included. But this could be in the small print – so read it all!) If you're buying in person, check that everything is there and it all works properly before you leave the shop. If you're buying by mail, ring the supplier first to confirm the price and availability, and ask what your options will be if there should be any problem. Find out when you can realistically expect delivery. Always keep all receipts and make records of all correspondence, whether it's by mail or by phone.

How to protect yourself

If you are buying goods of more than £100 in total value, always try to use a credit card. That way, in the unlikely event of anything going wrong, you will be legally entitled to claim against the credit card company as well as the seller, even if the seller has gone bust. You may also get extra insurance – check with your credit card company.

If you're not paying by credit card, pay by cheque. Never send cash through the mail – it is impossible to trace if it gets lost, you can't stop payment if you need to, and even if you have proof of posting you can't prove how much you sent.

Keep records. If you are paying by credit card keep a note of the exact time of the order and ask for an order number. If you are paying by cheque make sure you fill in the details of date, amount and payee's exact name in the stub – and keep it!

When a mail order arrives

Check everything carefully. If anything is missing, contact the supplier immediately. If something doesn't work, make obvious checks (the fuse, etc), but don't try to repair it. If there is anything you're not happy with, don't use the product – if you do, you could be deemed to have accepted it.

If there's a problem

Whether you bought it by mail or in a shop, the law says a product must be:
1. 'of merchantable quality' (that is, broadly speaking, it must work),
2. 'as described' (in the advert or in person – and this one criterion also applies when you're buying from a private seller, not a business), and
3. fit for the purpose for which it was sold or for the purpose you specified when you ordered it.

If it fails to meet any or all of these criteria, then you are entitled to return the goods for a refund, receive compensation for all or part of the value, or get a replacement or free repair, depending on the seriousness of the defect. These are the 'statutory rights' that adverts always say are 'not affected' by any extra guarantees. The supplier cannot change or deny these rights.

If you're not happy about something, always contact the supplier first and politely explain your problem. Most problems are sorted out at this stage with no fuss. If not, put your complaint in writing and send it to the manager or owner – ask for the correct name and job title. Give the supplier a reasonable time to reply – say ten days or so.

If the problem is still not resolved, you may need to take some sort of legal action to enforce your rights. This need not cost you a lot. Seek advice from a solicitor (ask about the free advice scheme) or from one of the following (check in your local phone book):
- Citizen's Advice Bureau,
- Trading Standards Office (listed under your local council),
- Office of Fair Trading, or
- County Court (ask about the 'small claims procedure').

Win *the latest in flight sims*

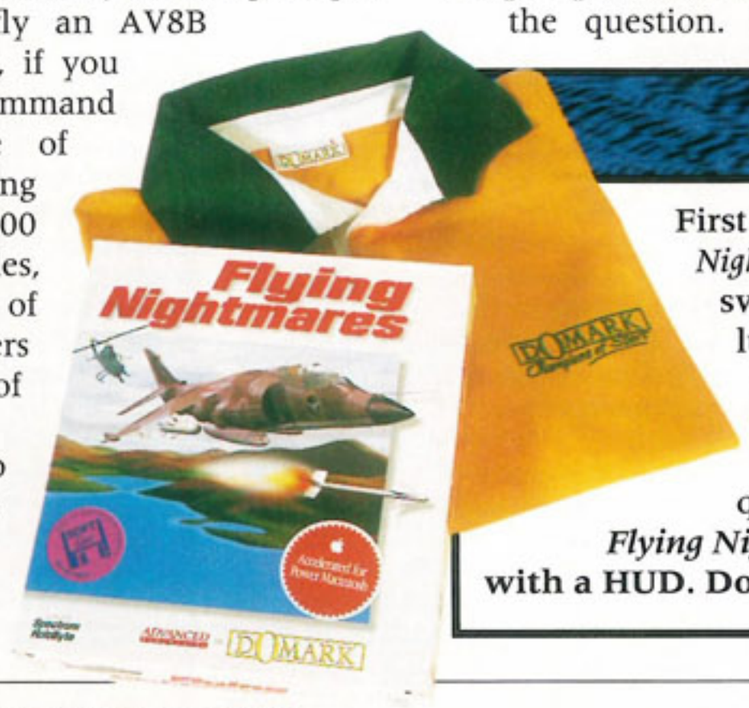
This is it! Your chance to win a copy of *Flying Nightmares* – Domark's new flight sim – plus related goodies, all courtesy of Softline.

Domark's enthralling new game puts you in command of a complete United Nation's force, tasked with invading East Timor and kicking out the naughty Indonesian occupiers. (Bit of strong politics there, I think.) Not only do you get the chance to fly an AV8B Harrier jump jet, but, if you want, you can also command a naval task force of assault ships, landing craft, warships, 8,000 troops, their vehicles, stores, a squadron of Harriers, helicopters and a crack troop of boy scouts. Probably.

The enemy, who are controlled by your Mac, respond to your method of attack, which means that you can play the game as many times as you like, using different tactics each time.

Flying Nightmares comes in both Mac and PowerMac versions and one could be winging its way to you, if you can answer just one simple question. Well, its simple when you set the question. Write your answer on a postcard or stuck-down envelope and pop it in the post to us here at MACFORMAT.

Employees of Future Publishing, Softline and Domark (and their families) are not eligible to enter. No multiple entries are allowed – and we do check, so don't try it. The editor's decision is final and the closing date is **Friday 15 July.**



QUESTION TIME

First prize is a copy of *Flying Nightmares* and a fab Domark sweatshirt, while the ten lucky runners-up will each receive a sweatshirt.

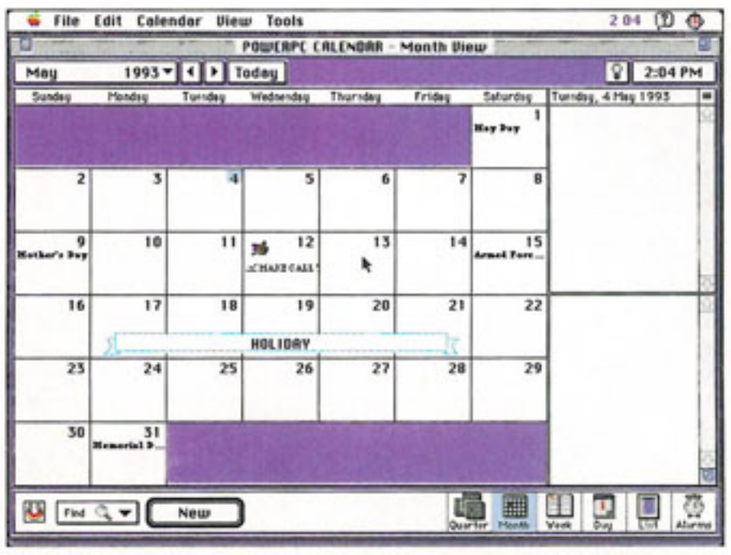
So, hang onto your joystick – here's the question: **The Harrier in *Flying Nightmares* is equipped with a HUD. Does this stand for:**

A. Hands Up Dismay?
B. Heads Up Display?
C. Hello Uncle Dennis?

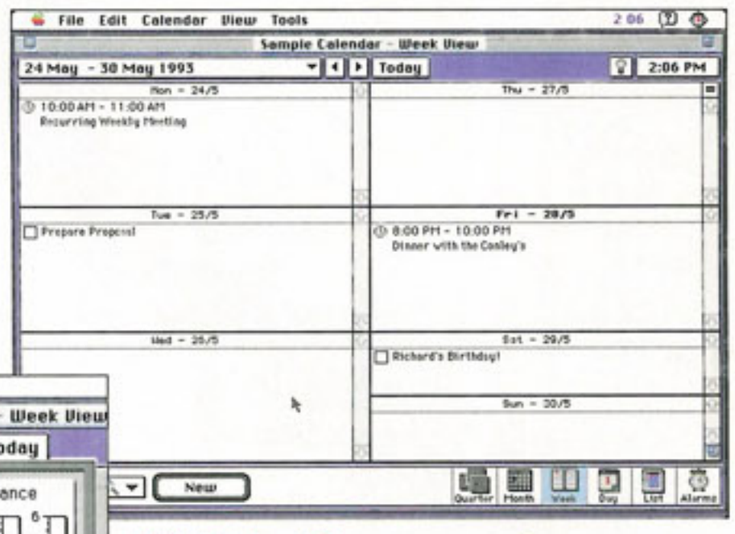
It couldn't be easier now, could it? So, **send your entry to: Flying Nightmares Compo, MACFORMAT, 30 Monmouth Street, Bath BA1 2BW.**
Please state if you don't want your name added to a mailing list.

Make it a date

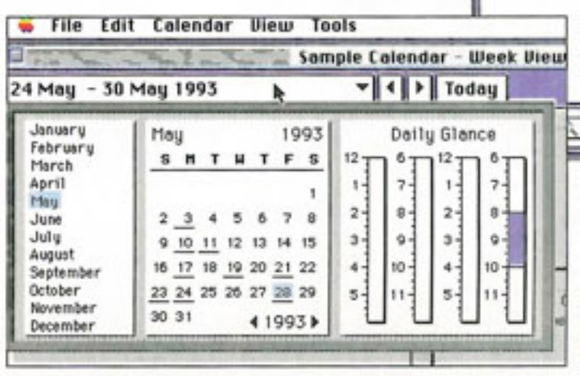
Bored with Filofaxes? Fed up with Post-It notes? Andy Hutchinson tries out the latest Mac organiser: Aldus's Datebook Pro.



Let's see, I've been working rather hard lately, so I think I'll take a week off in May. I wonder if my boss will mind?



With *Datebook Pro* you can organise your personal, as well as business life (if you have one).



This really easy-to-use interface lets you plan ahead, with just a few clicks of the button.

OK, I'm not the world's most organised person. For the last twenty-something years of my life, I have muddled through by using copious amounts of Post-Its, liberal quantities of knotted hankies, hundreds of scrawled messages on the back of my hand and (on the odd occasion) my memory. I haven't done too badly, either. So long as we gloss over the time I missed my English Literature 'O' level and the sad day when my parents waited 18 hours at Gatwick.

Datebook Pro is designed for losers like me. At its simplest level it's a calendar program, but delve deeper and you'll discover a reminder program, an alarm, a holiday reminder and a time-organiser.

All of *Datebook's* functions are accessed from a date screen. You can view either the quarter, the month, the week or the day, or you can see a list of upcoming occasions. The program automatically selects today's date and shows your diary both in a little date box and on the right of the screen.

The program deals with three different kinds of entry: Events, To-Dos and Memos. An Event might be something like a meeting which starts and ends at a specific time, a To-Do might be a reminder to make a telephone call on a specific day, and a Memo is just a note to yourself.

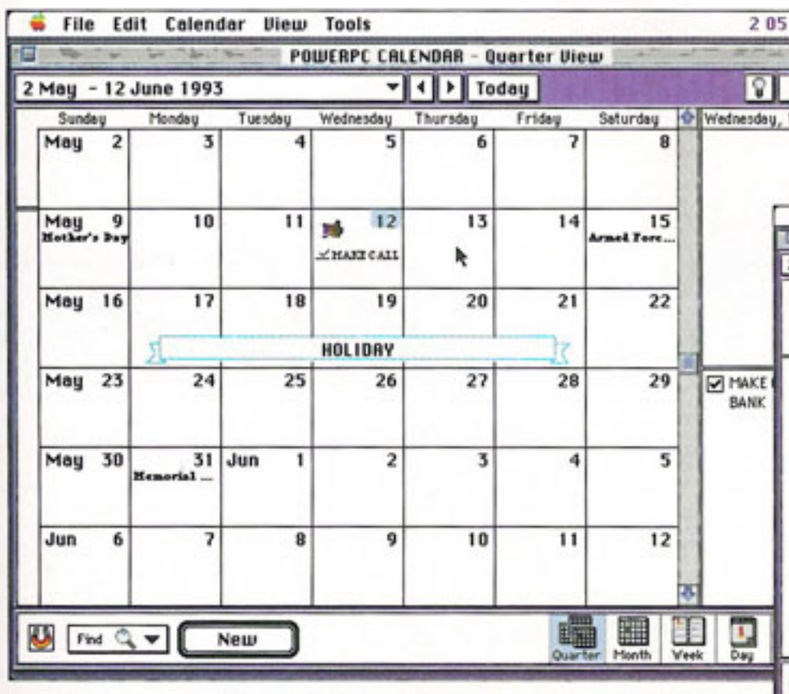
Once you've entered the data, you can quickly gain an overview of exactly what's going on in your life. You can even make individual events stand out by giving them a snazzy little icon, such as a typewriter, an airplane or a football. There is also a banner function which drapes a long icon over a series of days, which is useful for things like holidays.

The To-Do function is one of my favourites. To-Dos appear in a side window for each day, along with a check box which you tick when the task has been completed. If you don't tick this box, it gets carried over to the next day along with a note of how many days it's overdue. If your days are particularly full, you can use the Gantt display option. This uses a bar graph format to show you what's happening at a particular time. All of which makes it easier to spot when you're double-booked.

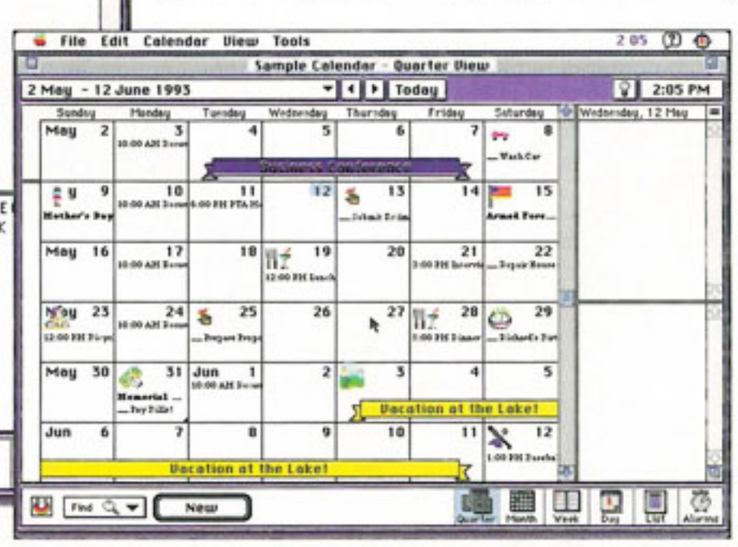
Datebook Pro is crammed full of useful diary functions. One of the best is its ability to display specific items. For instance, it can show all the To-Dos you've labelled 'urgent', forthcoming events for the next 30 days or 'low-priority' events for the next week. All of which helps you either prioritise your work or, if you're like me, fly into a blind panic at the thought of all those hours of hard slog.

There are plenty of organiser utilities on the market, but Aldus's *Datebook Pro* is definitely one of the best. They appear to have thought of everything (although a feature enabling you to get someone else to do all your work would have been nice). Ultimately, personal organisers are only useful if you can get yourself organised enough to keep them up to date. My Filofax remains empty, my Letts Scouting Diary (1976) is bare, but my *Datebook Pro's* chocka. And if it can help to organise my life a little better, then it can help anyone.

Andy Hutchinson



You can plan your life by the day, week, month or quarter. One of the most useful features is a reminder to tell you what you really ought to have done yesterday, but didn't.



Even if you have a really horrid week coming up, you can at least take comfort in the fact that it looks pretty.

DATEBOOK PRO

Price: £65.
Requires: A Mac Plus or higher, 2Mb of RAM and System 6 or above.
For more details call Iona Software on 081 241 8925.

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ISSUE 1

March 1993

■ **On the disk:** *Lemmings; Disinfectant 2.9*

■ **Inside:** *Morph* and *Publish-It Easy* reviewed; Software roundup

■ Sorry, this issue's completely sold out!

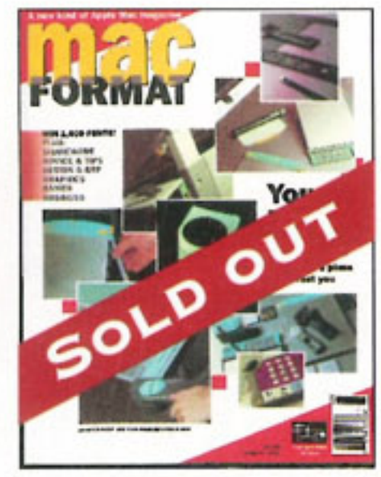
ISSUE 2

May 1993

■ **On the disk:** *Spectre Supreme; SuperClock!*

■ **Inside:** *MacWrite Pro, Painter 2, ClarisWorks 2* reviewed; hardware roundup

■ Sorry sold out!



ISSUE 3

August 1993

■ **On the disk:** *Arashi* and *BiPlane*

■ **Inside:** *Paint It!, Colour It!, StuffIt Deluxe* reviewed; The future of the Mac; using charts and graphs

■ Sold out too!

ISSUE 4

September 1993

■ **On the disk:** *Address Book; Ritz Starter Accounts*

■ **Inside:** *Fetch, Image Browser* and *Stacker* reviewed; essential software; Apple's pocket assistant, the Newton

ISSUE 5

October 1993

■ **On the disk:** *Do It All!, PopChar, Greg's Buttons*

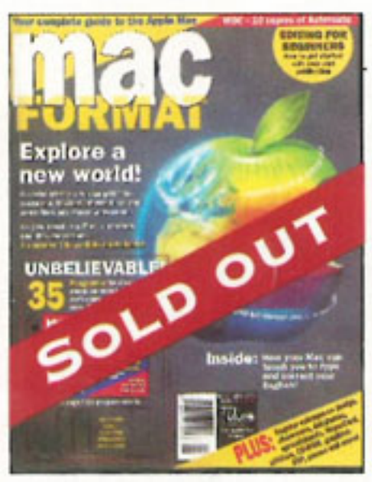
■ **Inside:** Computing on the move; PowerCD on test; Photo CD software; 50 *QuarkXPress* tips; PowerBook buyer's guide

ISSUE 6

November 1993

■ **On the disk:** *Civilization, Eclipse, Tetris 2000*

■ **Inside:** How to choose and use a scanner – from hand-helds to flatbeds; *Morph 2, AutoRoute* and *C.A.T.* reviewed; 50 *PageMaker* tips

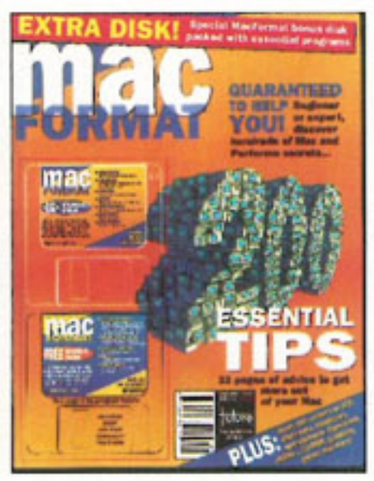


ISSUE 7

December 1993

■ **On the disk:** *Disinfectant 3.2;* seven handy *Quark* add-ons; a whopping 35 programs in all!

■ **Inside:** Complete guide to comms; *Astound* and *QuickKeys* reviewed



ISSUE 8

January 1994

■ **Double disk issue! On the disks:** *NIH Image, Graphic Converter, Maelstrom*

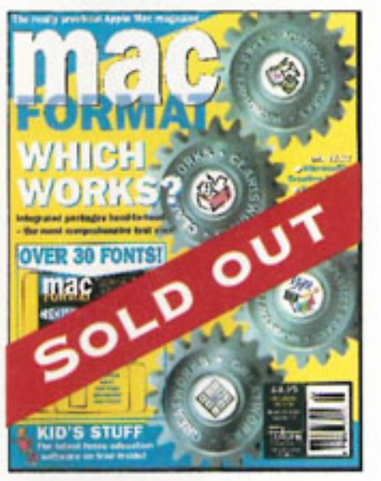
■ **Inside:** Loads of Mac and Performa secrets revealed – 200 top tips in all; Adobe *Dimensions* reviewed

ISSUE 9

February 1994

■ **On the disk:** *SimCity 2000 demo; Greg's Browser; QuarkXPress 3.2* patcher

■ **Inside:** Bumper games guide; *SimCity 2000, FreeHand 4* reviewed; tips for keeping your Mac safe



ISSUE 10

March 1994

■ **On the disk:** Over 30 indispensable TrueType fonts; *Disinfectant 3.3; Apollo* launcher

■ **Inside:** Integrated Works packages, *Creative Writer* reviewed; clip art

ISSUE 11

April 1994

■ **On the disk:** *ResEdit; SpeedyFinder7; GNU Chess*

■ **Inside:** PowerMacs exclusive; complete guide to your System Folder; printing solutions; chess games reviewed

ISSUE 12

May 1994

■ **On the disk:** *Prince Of Persia 2* demo; *Scrapz*

■ **Inside:** What you can do with shareware; hard disks, removables and optical drives; tips for using colour; *PGA Tour Golf II* reviewed

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ISSUE 13

June 1994

■ **On the disk:** *Syndicate* demo; *Disinfectant 3.41*

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■ **Inside:** How to double your RAM and disk space – without buying extra hardware; *Print Shop Deluxe, ColorStation* and Fargo Primera printer reviewed

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Does anybody really read this stuff?

It's at this time of the issue that having the Tiny Zone seems a really daft idea. The next month page is just about the last one we do (it's only now we have the least idea what's happening next month), and you just about think you've finished it when you realise there is still this 2cm by 2cm corner in the corner, which somehow manages to have more words in it than the rest of the page put together. So there's only one thing for it – the old journalist's cop-out of writing a piece about writing the piece. This Tiny Zone is even more of a nightmare than ever because not only is it the day after the whole Mag was due at the printers, but Mark the art editor has gone off sick and Alex's wife (he's the editor) went into labour in the small hours of this morning. It's at times like these that you wish you'd listened to your career's advisor at school and never entertained these stupid ideas of being a journalist. It's not a glamorous life you know. We're not all peering over the fence at Balmoral hoping to find a Windsor snogging a corgi. Oh no. Most of it is the horror of deadlines, followed rapidly by the realisation that there was a horrible cock up on page 46 which you didn't notice until it had gone to press. Anyway, it seems it has become a Tiny Zone tradition to have a little compo hidden at the end for those of you with keen eyesight or a pair of magnifying glasses. So: 100 fonts from the Monotype collection, RRP over £100 (but we sell 'em for £50), are yours if you can tell me what font this incredibly small writing is, and indeed how incredibly small it is in points. You'll need one hell of a type scale to measure it. Send your entries, in the largest font you can find, to The Tiny Zone at the usual address as soon as you can, and you could win some fonts to recreate this excruciating effect for yourself on your Mac! If you're daft enough, of course...

Next month

Getting computer art to look as though it was created using traditional techniques is no mean feat; a practiced eye can spot a Mac-produced graphic a mile off. But increasingly, programs have become available which enable you to create 'Natural Media' effects simply and, most importantly, convincingly.

The leader in this field is Fractal Design with *Painter*, but the company has now released a simpler version of this program called *Dabbler*, which brings Natural Media art within everyone's price limits.

As well as reviewing *Dabbler* next month, we continue the series which we started this month on how to create natural effects from within standard Mac paint programs.

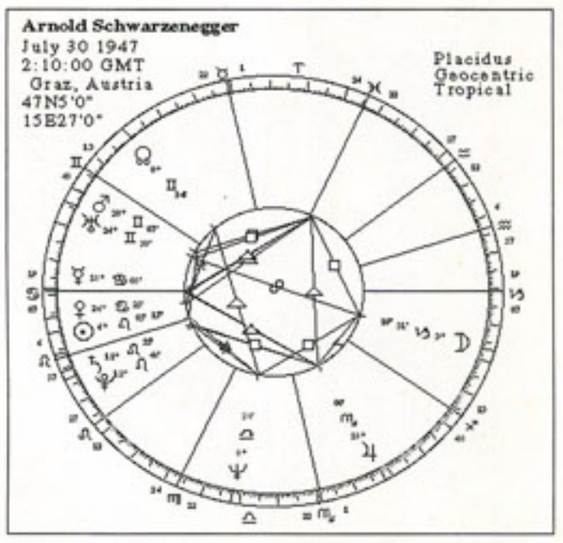
One program which doesn't just create natural-looking artwork but creates entire natural-looking worlds is *Vista Pro*, a fractal landscape generator. We explore this fascinating program and show you how to create whole new worlds on your Mac!

Still on the art front, but at a more junior level, Microsoft's *Fine Artist* is a painting program aimed at kids. There are plenty of them about (paint programs that is, not kids), but with the might of Microsoft behind it, could this one be the best?

On a more frivolous note, we take a look at astrology programs which forecast your future, and preview the sequel to *7th Guest* – before the original is even properly available! And, if you've ever fancied using your Mac for music, we show you what basic hardware you need to wire up your Mac to your Casio!

■ PLUS The latest news from around the world; the hottest Mac games; your Mac problems solved in MacAnswers; how to achieve a sepia-toned effect with graphics; a guide to charting with spreadsheets, and how to pick the right chart for you; reviews of new multimedia programs and a brand new low cost DTP program; all the latest shareware, plus MACFORMAT's regular comprehensive coverage of just about everything you can do with a Mac!

And, of course, there's a cover disk or CD-ROM packed with the very latest and best Mac programs and demos.



If the ram's in the ascendant and there's a bad moon rising, then Russell Grant's in trouble, because you can do it all from the comfort of your Mac, without having to refer to the soaraway sun at all.

With *Dabbler* you can create Mac art that looks like it's done with oils, watercolours, charcoal – anything!

Here's the sort of graphic you can create with Natural Media programs – we show you how next month, as our series on graphics techniques continues.

Create entire worlds out of thin air with *Vista Pro*. Add trees and buildings, then you can, er, look at them and stuff. It's a very practical program, honest. Dozens of uses – I can think of hundreds, in fact. You can even create *QuickTime* animations, which give the impression of flying up and down valleys. It's so realistic you can get air-sick.

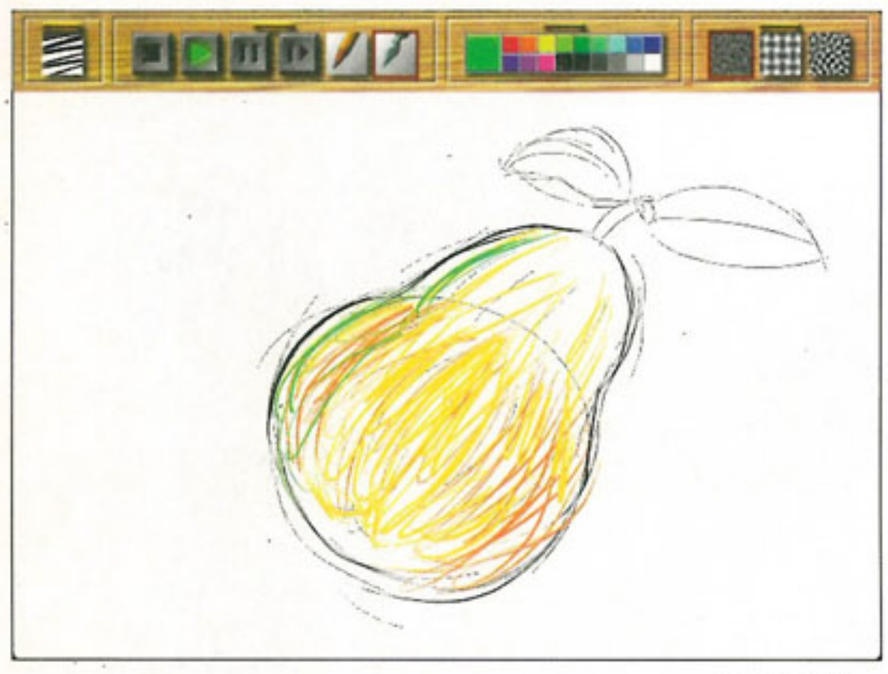
MACFORMAT 15 goes on sale on Thursday 17 July

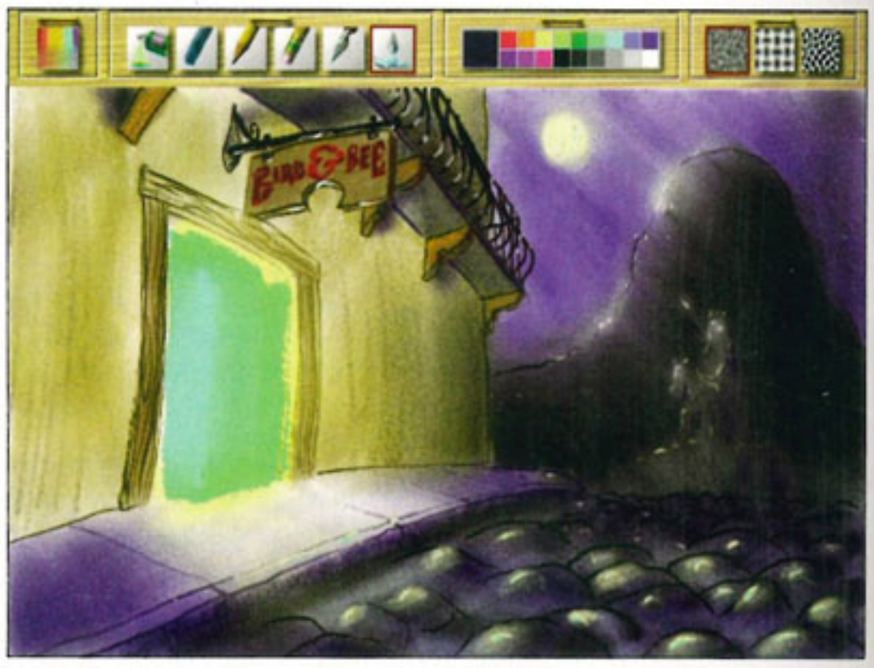
Reserve your copy with your newsagent now, or turn to page 94 for our special subscription offer! Move fast, and you might just be able to get hold of the limited CD-ROM edition!

Win an 'interactive Mac art school'

Win a copy of *Dabbler* and enter the world of Natural Media. This easy-to-use art program was created by Fractal Design, the company behind *Painter* – and we have ten copies to be won, courtesy of Letraset Software.

Everybody knows that the Mac is the machine of choice for art and design professionals, with a range of powerful software that can do almost anything you want to do. But wouldn't it be nice to have a straightforward Natural Media paint program which included a full range of features but was still easy enough for anyone to use – and ran at a decent speed even on humbler Macs? That's *Dabbler* from Fractal Design, the people who brought you the award-winning *Painter*. *Dabbler* has a wide range of tools, including pencils, pens, felt pens, erasers, chalk, crayon, watercolour, oil paints and an airbrush; effects such as blur, wet, fill, fade and liquid-brush smear; and dozens of paper textures to choose from. Drawing exercises by the famed Walter Foster are included, making *Dabbler* a complete interactive art school. All this is accessible using a clever 'drawer' interface system on-screen, and there are lots more neat touches to make your artistic life easier, and leave you free to concentrate on creating your masterpiece – hopefully.





All you have to do to win one of ten copies of *Dabbler*, each worth £88, is answer the three simple questions below. Send us your answers on a postcard or the back of a stuck-down envelope (nothing inside). Employees of Future Publishing, Fractal Design, Letraset Software and associated companies, and their families, are not eligible to enter. No multiple entries are allowed, unless they're written on the lid of a nice set of gouache paints with a big tube of Chinese White that hasn't dried out. Please state if you don't want your name added to a mailing list. The editor's decision is final, and the closing date is Friday 15 July.

THE QUESTIONS

1. What is the interface of *Dabbler* designed to resemble?
(a) A desk with drawers
(b) A drawing board with a parallel-motion ruler
(c) An artist's palette with little blobs of paint you can mix together to get new colours

2. Which of these is *not* an art program from Fractal Design?
(a) *Painter*
(b) *Sketcher*
(c) *Dilettante*

3. What is a Natural Media paint program anyway?
(a) One which includes other media, like sound and film clips, to make using it easier
(b) One which can imitate the results of media like chalk, watercolour, airbrush, etc
(c) One with no custom colours

Simple, right? Just send your entry to: 'Dabbling in the arts', MACFORMAT, 30 Monmouth Street, Bath BA1 2BW.

0432 0765 0800

4GB turboDAT £999

inc Retrospect 2.1, installation kit

150Mb tape £499

MacUser Awards 1993 WINNER

Best Buy MacUser

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tape	int/ext	media
150MB	/£499	£16
2G DAT	£829/899	£10
2-8G DAT	£889/949	£10
4G Turbo	£929/999	£16
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Since our DAT was a 5-mouser best buy, we've doubled the buffer size for even smoother backup, doubled the speed and doubled the capacity! No wonder it won the best peripheral category of the MacUser awards! Full compatibility with DDS1 standard drives (2GB and 2-8GB). Power Macintosh compatible.

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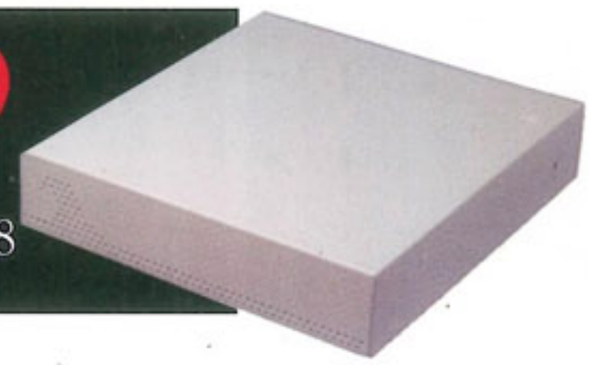
3 year warranty
hard disks over 300 Mbytes optional on other drives

1GB disk £609

UK installation kit £18



Powerbook & pocket drives too!

hard	disks	seek	int/ext
50	16		£108/168
210	12		£189/266
260	12		£219/289
330	12		£274/349
500	9.5		£339/419
1000	9		£569/609
1200	9		£698/758
2000	9		889/919
4000	9		2368/2498

seek times are average, "effective"

Our 1000MB drive outperformed every other 1GB drive in MacUser's 1993 gigabyte drive test. Real world performance of all the other 1 Gb drives tested was up to 130% slower. Yet none had a lower cost per megabyte.

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270MB Syquest	£360	£74
128Mb Optical	£549	£24
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98% of orders shipped from stock. All external drives (except 105/270 Syquest) have 90-270V power, twin 50 way SCSI, pushbutton ID switch, platinum grey "zero footprint" aluminium housing. Installation kit comprises UK mains cable, SCSI system cable, terminator.

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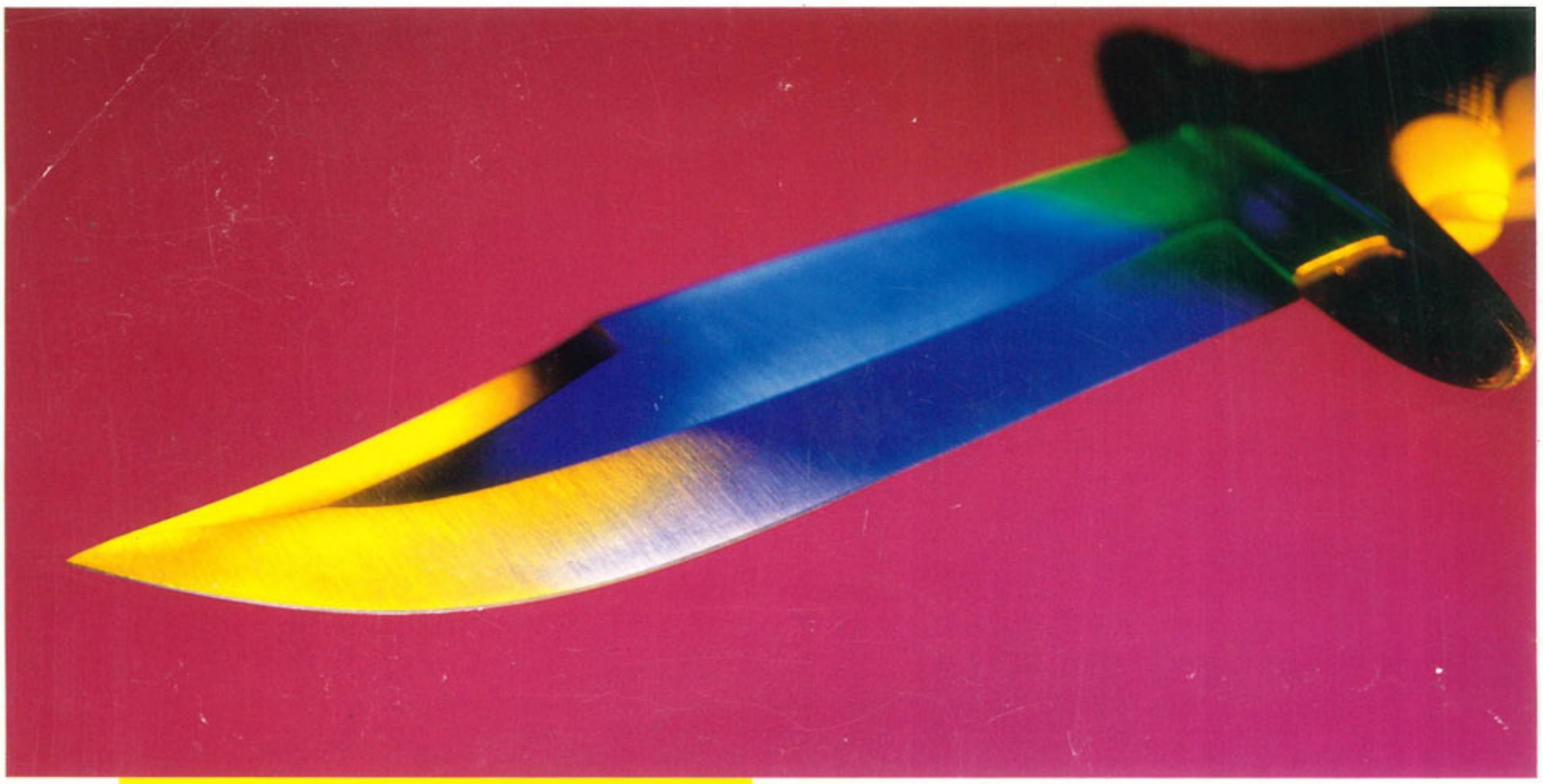

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