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- see page 119



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EDITOR
Richard Minton

DESK
CO-ORDINATOR
Jason Hobbs

GAME EDITOR
Mark Highton

STAFF WRITER
Gary Jones

ART EDITOR
Dean Pincot

DESIGN
ASSISTANT
Kevin Haines

ADVERTISING
MANAGERS
Margaret Clarke
Marie Lavelle

2nd Floor, Marine House
20 High Street
Birmingham B1 1BB
021 424 7222

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Hemel Hempstead
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SPECIALS



DAATASCAN 23

It's so big! Tempest's new hand-held version for the ST offers you 108mm wide screens. Scan the facts.



COMPUTER VISION

Big Brother's could be watching you... discover how magic eyes, robots and cameras are changing the way computers see the world.



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IS THE ADVENTURE DEAD 53

Have 35 hit games killed the art of adventure? Discover what you're missing.



PERSONAL FINANCE 47

Can't work out where it all goes to? Let our ST take the strain.



AMIGADOS 1.3 95

It's finally here! Sell your things over the wire again! Plus, a preview of the new ST 705.



PUMP UP THE POWER 24

Having trouble running those fancy games and art packages that need a megabyte or more? Does swapping disks drive you to distraction? Here's the definitive guide to upgrading your machine - move up a gear and make the break.

GAMES



SCREEN PLAY 66

Adventure, strike back this month! Could Ultima II be the ultimate game? Or will Populous take the pleads? Get the Format Gold verdicts here. Plus the definitive views of Cybertron II, Joe McKeown, Genesis, Man... if it ain't here, it ain't worth playing.



GAME BUSTERS 78

Honestly is the best policy. But if that doesn't work, here are 2000 back doors to your favourite scores. Cheat your way to a high score overlord.

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FORMAT SUPERDISK

The ST and the Amiga - two different machines, one superb disk. Don't just sit there, feed it up and get going!

BY ZAK McCRACKEN AND THE ALIEN MINDBENDERS

What a marvellous, what a gem! Playable complete of Lucasfilm's wacky SF adventure **FLUKE** FullText read text editor - Address Book personal organizer - Label Expert for disks, cassette and cards.

CYBERVOID II

Rowson's second arcade smash - read the review, then experience five boss and a whole lot's worth of mutant death!

FLUKE: FullText for unlocking those text files

AMIGA



ST AND AMIGA DEVFAC I

The only way to learn machine code. To go with the start of our 80000 tutorial on page 91, try out the complete version of HOGG's superb development system on ST and Amiga...

MUSIC



SAMPLERS ON TEST

13

Reply 4-CD and AMRG (Amiga) challenge the sound sampler market - tune in to our review



OCEAN SHANTIES

42

If you've played Rattle & Roll or had a dozen other Ocean games, you've heard this man's music. Jonathan Dunn tells how it's done

GRAPHICS



CYBER SCULPT

57

3 dimensional modeling comes to the ST. We check out this heavyweight graphics newcomer



MOVIE SETTER

60

Gold Dax's latest offering aims to take the best out of animation. Does it do the trick?



ANIMATOR'S SECRETS

88

Starting a new film project on the who, why, where and when of animation techniques.

GREY MATTER

As far as computers go, America is generally seen as the place where it all happens. The ST and Amiga were designed in the States, and a high proportion of software development for the two machines goes on there.

Some American companies have ties with companies this side of the big pond. Activision and Electronic Arts, to name but two. The U.S. software is shipped in and resold.

However, there's nothing to stop enterprising individuals trying up the States, buying a load of stuff, shipping it over here and reselling it without any official sanction. Such deals are disparagingly called 'grey imports'. As with the case reported last month when Calsonic imported the US version of Calamus against Atari's wishes, these grey imports annoy the mainstream distributors. This is especially because (a) the U.S. version is often different to the U.K. version, (b) the importer (who cut deals before as they arrive in the country) can't answer users' technical questions, but grey importers often get the product before the main distributor.

Computers feel that grey import

versions of their software can unfairly give them a bad reputation. This is fair enough, and of course to provide better support for users are to be welcomed.

However, it's grossly unfair that European users should be forced to wait many months for products that have been out in the States (eg. Workbench 2.3 and Calamus). After all, putting a batch of boxes on a plane doesn't take long.

If distributors want to cut grey imports out, there is a very simple way to do it: stop the products in as soon as they are released in the States, and charge a fair exchange rate for them. Unless the financial markets have changed dramatically, it doesn't equal £1, despite what many suppliers would have you believe.

Let's have a fair deal for all

R. S. Mountain

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STEINBERG CHANGE THEIR TUNE

After months of peddling to computer users worldwide, Steinberg has decided to go ahead and develop an Amiga version of their highly successful Pro-24 sequencer. A beta test version was presented recently at Frankfurt, and it is expected that the final version will be available in the UK sometime within the next few months.

Pro-24 is regarded as the industry standard sequencer. Pro-24 V3 boasts score editing, transposing, and real time playback sequencing.

The Amiga version is expected to cost £290 which is £25 cheaper than the ST version. Overlake Soundware is the official distributor of Steinberg software in this country - can be contacted on 0993 80228.

AIR MILES FOR STS



■ **Component of Lightbulb with an going away £2. An 800w incandescent with every £20. £1750. Component sold. Component not located at Jodan (New). Lightbulbs, Leds, £217 000 (0608 626444).**

GFA GERMANY SET TO INVAD

In a surprise move GFA System Technik of Germany are to open offices in England and take over the publishing and distribution of their products from current UK outlets. The British companies worst affected by this are Gintop Publishing and Microdeal. For over ten years Gintop have been publishing a long line of GFA Germany's titles including GFA BASIC, GFA BASIC Compiler, GFA Vector and GFA Dual.

GFA Germany's plans first became apparent when they decided to publish the English versions of all Amiga titles and give the UK distributor rights to Microdeal. Amiga GFA BASIC is the only package to date to be handled by Microdeal. At the time the most successful Gintop, and naturally Peter Heines - Gintop's MD - was interviewed: "We publish products, we don't distribute. System Technik used to send us the German version of a product and leave us to do the English translation and package the thing as we thought best. Our role was, and still is - until this offer is properly sorted out - as publisher and to support the end user. It's unlikely that Microdeal can provide proper customer service as the English version of Amiga GFA BASIC was put together in Germany.

"It's a shame GFA has decided to set up their here... particularly after all our hard ground work. There's nothing we can do about it. It's perfectly legal according to the terms laid out in the contract", continued Heines.

This isn't the first time that GFA Germany have acted in this way. America was the first to be invaded. Microdeal had to come to terms with it then, just as Gintop have to now. More recently, France has been the target of this over-greiving German company. GFA's sights are now set on England where they hope to do great things. An enthusiastic but cautious, head of GFA, System Technik, claimed: "I can't say who will be in charge of the English operation, but we expect to cause the same stir in the computer world as Alfa caused in the Pop world."

Because of the turmoil created by GFA's announcement, Steinberg won't release any further GFA titles.



■ A collection of GFA System Technik's products that will be distributed exclusively by the German company when they set up camp in the UK sometime in July. But Heines, head of GFA, has high hopes: "... an expert to cause the same stir in the computer world as Alfa caused in the Pop world."

until the situation has been clarified. A disgruntled Heines said, "GFA Raytrace, amongst other things, has been delayed due to GFA's action, and it's unlikely we'll still continue work on this and we'll have further talks with GFA. As a result, we've been pushed into other markets sooner than we would have liked. We're moving into the PC marketplace; it's unlikely we'll do much on the ST and Amiga."

Whether GFA's move to Britain will be good for the UK various software scene remains to be seen. GFA are confident it will.

■ **Readers worried about support for GFA products can expect the same level of service from Gintop and Microdeal as until July. After that things are as yet uncertain. If you feel either company unable to help, or you can't get an answer to a problem regarding software, then contact GFA (later at 1181 Holland Drive, Orem, Utah), (801) 224-1100. The club supports all GFA products and is in constant communication with GFA Germany.**

DEVPAC FOR DEVELOPERS

Heff's Andy Parnell is currently working on a developers version of the widely acclaimed Drogac assembler/interpreter/compiler package. Along with all the traditional features of Drogac 2, the developers kit promises to allow you to produce Amiga file formats from an ST and vice versa. On top of this you can connect two machines via the parallel port and assemble directly to the slave computer, run a program on one machine and view debugging information on another.

Only alpha level versions of the package are available. Along with the programmers of Micro, Ozon's John Brantwood is the only person to be using the alpha system. Because the package is in such an early state of development no price or release dates are yet available.

■ **Micro, The Old School, Greenfield, Bedford, MK45 5NF (0928 708180)**



BATTLE OF THE PAINT PACKAGES LOOMS

Two major art packages for the Amiga, *Photos Paint 2* and *Deluxe Paint II*, are set to clash onto the scene sometime in the next month. Earlier incarnations of both packages have been taken seriously by professional animators and artists who envisage the immense power they provide.

Photos Paint will be selling manufacturers' *Photos Paint 2* at £85.99 just as soon as it arrives from the States. Upgrading from earlier packages should be possible, but details haven't yet been finalized.

Photos Paint contains many standard drawing functions, along with its own proprietary features. Standard options include a range of brush operations, tonalities with definable source location and intensity, flood and background fill as well as surface mapping.

Some of the new features, provided in version 2 consist of

colour mapping (the ability to wrap a brush around a 2D (and 3D) drawing with adjustable size and offset), stretch brush functions, multiple wrap page with animation frozen in, alternative drawing sources such as sub-through, Penograph and brush patterns, air brush with definable spray area, fill polygons and polygon and brush output. For the really dedicated there's also a stencil for protecting certain areas as well as gradient colour spreads.

Both animation and dithering facilities are purported to be present in *Electronic Arts' Deluxe Paint II*. A new technique called *AnimPaint* will be included which allows the user to draw a series of screens in much the same way as a single screen would be created. It's possible to define a brush, determine the distance for it to travel in three dimensions, its rotation (about three axes) and the



■ Within the next month *Deluxe Paint II* and *Photos Paint II* will be upgraded. DPM and PPD are set to show your mind.

number of animation frames across which the movement will be shown.

Additional functions include extra palette (this makes it possible to paint in 64 colours rather than 32), extra mode in which a brush can be wrapped into any shape, but made for colouring black and white images; direct American dithering; access to any number of fonts, styles and sizes. The price will be £79.99.

Upgrading from *EPN* looks likely to cost £30 while upgrading from the *DP* will cost £50. *Deluxe Paint II* requires 1Mbyte of memory.

■ **Artvision (Photos Paint 2)**
Baker House, Manor Farm Road,
Reading, Berkshire, RG2 6BN
(0494 330004)

■ **Electronic Arts (Deluxe Paint II)**
Langley Business Centre, 11-4P
Station Rd, Langley, Bucks, MK3
9TX

UPGRADES

Here are the latest additions and bug fixes to enable pathfinders, soft-edge fonts, set as base and improvements you've made to your products so that we can mention them in these pages. *Maths* v2.1 at £49, *Recursive Robot*, £9,200 £870 - now a possible to most software and it consequently more powerful, enabled saving features, complete different operational procedures, bug fixes, *Demarc*, 2 Amiga 2.12, *Relax*, £225, £118.00 - bug fixes in the debugger and the addition of engineering features in the assembler. These upcoming features aren't yet available in the 2.7 version.

QUICKIES

- **ST GFA System 2** from Genlog (01-44) 41 30 contains GFA Basic V7 and GFA V7 Compiler in one package. The new £49.99 price compares very favourably with the original cost of the two items, £45.95 each.
- The **President** Collection from the makers consists of four of their color game releases: *Waterworld*, *Planetes*, *Exiles* and *Jungles*. Cost is £29.99.
- **Arvidse Software**, notable for the *Accident Guide* for the Amiga and the BBC *Emulator*, have released **OPUS-1 MCI** for the Commodore Amiga. It allows music, graphics and tracks to be easily defined with text. The result is a complete totem, a standard 87-588.0 music file. The file is claimed to be compatible with all other ST music programs.

MCI is priced at £29.95 and is available from 275 Normal Rd, London W11 9BB 00008.

■ **Amiga Sound Quest** is now being distributed by Computer Music Systems of Widdows. *Sound Quest* Editors start from £79.95 and are available for DOS1, S18, S90, H1, S280 and CP synthesizers amongst others. Music Systems also provide a range of music education packages for musicians who've never learned to read music. Prices start from £29.95. Further details on 01-817 4540.

■ **Latitex C++ Compiler** now includes documentation for the standard Latitex C library. The new literature provides a syntax for each C function used as well as a description of the function's purpose, the return value provided by the function and a class reference to other related

functions. The suggested retail price of *Latitex C++* remains at £95. Contact your local Latitex distributor or Latitex direct on 020-412 944 1600.

■ The London Area will feature **Presentations '88**, an 800k sized computer and video graphics class, from October 4th to 6th. Database Exhibitions, organizers of both the Atari and Commodore shows, will be running the show alongside the 1989 Database and Professional Publishing show. Information on 0426 8789 79.

■ **Bornie Productions** have moved to 11 Craighall Centre, Dunning, Livingston, Scotland (0263 41 86311).

■ There are more products have been added to *Electronic Distributor's* extensive range of add-ons for use with *Color Studio*. The **Video Tiling Design Disk** provides profes-

sional finishing touches to a screen. A 30 font and file of 30 objects are included in this £29.99 package. **SD Fonts 1** and **1.1** are the other two small sets from *Electronic*, both retailed at £29.95. The fonts packages provide numerous fonts and 30 sizes to together with a font designer. *Electronic* are on 0480 490540.

■ *Slide Shop* are now distributing **Magnivision**, a 27" high-resolution monitor for conversion to an ST. This is particularly suited for STP users, since it an entire A3 page will easily fit on screen. Any well-known GEM programs - such as *DataManager*, *Professional*, *Fast Street*, *Paintstar*, *PageDirector* (when it arrives) and *Timecop* (STP - will make use of all the extra screen space. Price is £795.59. *Slide* can be found on 01-829 1111.

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ANY WHICH WAY

Demonstrated at the recent "What?" show was Atari's Transputer Workstation (ATW). The machine is heavily riced and ready to go. After a prolonged gestation due to troubles with its multi-tasking operating system, Helix, the floor-standing tower machine should start selling in April.

For around £4000, the ATW will incorporate a single T800 transputer running at 20MHz and delivering 10 mips of raw graphics processing power. While the transputer chomps out monster brats and marshies with aplomb (or so), all I/O is handled by a friendly 68000 running at 9MHz. The transputer has access to 4Mbytes of RAM, which can be increased to 16Mbytes internally, while the 68000 can also address 4Mbytes of video memory.

On a more mundane level, the ATW comes with 85C32, parallel printer port, DMS and MDI sockets, single 4.5" or 5.25" floppy and SCSI connector for a 40Mbyte hard disk. The machine is designed to work with Atari's current range of peripherals.

Helix seems to be working properly and can handle up to 13 T800s internally, with no limit if



■ Atari's Transputer Workstation as demonstrated at the recent "What?" show. Full production should start in April. The graphics processor, called Helix, is capable of some stunning screen resolutions: 1280 by 800 using 18 colours from a palette of 4096, 1024 by 768 using 256 colours from a palette of 16 million, 640 by 480 using 256 colours from 40 million and 312 by 480 in True colour.

there was a number of several projects under development. Most interesting is A500 users: is the A500 hard drive Plus. The A500 supports autodisk, making it possible to boot the system from a hard disk without the need for floppies. It's possible to add memory to the A500, improving the capabilities of the A500.

The drive is some way off and the preliminary specifications are likely to change. The current specification runs like this: 20Mbyte hard drive; sockets for up to 2Mbytes of RAM chips can be installed in 112K, 1Mbyte or 2Mbyte amounts; 80ms access time, SCSI connector which can accept a further seven devices; internal power supply that turns itself off when the A500 is powered down and is built-in fan.

Oddly Commodore were typing several software packages for their yet-to-released transputer card for the Amiga A2000. The development packages ready include Helix C (1.750), Macro Furbur (1.700), Program Pascal (1.600), Houdy Modula 2 (1.600) and H.C. Basic (1.600) are now available for Commodore's Amiga Transputer Card. Its release date for the transputer card yet.

The Birmingham Weather Department were there demonstrating how they use an A2000 to bring hourly weather forecasts to millions of television viewers. The Department have purchased the Amiga to capture and process imagery from a meteorological satellite over the equator. A team of weather experts use Amigas to create forecast captions as well as scripts to go with them. The complete weather presentation packages are sent down private data circuits to television studios where another Amiga receives them. The studio Amigas are graphicsed and the whole show is played live.

Report by Simon Williams

VIRUS DESTRUCTION KITS

Good news for users wanting to outsmart the software from virus attacks: DevLogic in the States have released Amiga AntiVirus while UK-based Excel are debuting Virus Destruction Utility for the ST.

AntiVirus, at \$39.95, prevents viral damage, monitors all possible virus transmission routes and checks for local viruses along with bootsector viruses. It claims to provide protection against all viruses.

STU, meanwhile, retails for the more modest figure of \$9.95 and recognises virtually all software that users file. It scans the sector between game bootsectors being transmitted along with at least 50 viruses from bootsector and the like variety. Other options exist for repairing damaged bootsector software, removing disks infected viruses and fixing damaged files, parameter files.

■ Excel Software, PO Box 239, Houston, TX 77069-0239 (800-856-5452)

■ DevLogic Inc, 20974 Woodloch Canyon Dr, San Diego, CA 92128, USA (619) 412 6700/760



■ Patrice says that the prime reason of their presentation Amiga A5000 - seems to be a very early version that is unable to install stand alone games, and won't be compatible with the final version - has a nasty virus that appears to be the complete from most virus killers. The release date for the Amiga version has been put back several months, but claims to contain a myriad of virus file sizes.

we add them outside the case. Helix is largely Unix compatible and comes complete with X-Window 3.1. All sorts of language, including C, Fortran, Modula 2 and Occam.

■ The latest word on the Laptop ST is that the design is now complete and the finished machine should be seen in April (nothing was visible at the show). One of the main problems has been coping with soft-filesystem users, who have to adjust to a transfer that rather than the mouse, start of the desktop ST.

AMIGAS UNDER THE WEATHER

Commodore had little time to show for the Amiga range, but





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TUNEFUL TWAIN

Sound sampling widgets are in no short supply for the ST and Amiga. Two recent pretenders to the throne offer much that is new. **RICHARD MONTEIRO** snatches musical ditties with them.

REPLAY 4

£79.95 ■ All STs ■
Microdeal, Box 68, St
Aythya, Cornwall, PL25
4YB (0726 68020)

It'sn't surprising to find in the catalogue of sound samplers released for the ST. Replay isn't new, the 4 is. Version 4 is a major upgrade from previous models, and includes new hardware circuitry and completely revamped software.

The Replay hardware, which is housed in a case and consists of nothing more than a couple of phone sockets, fits into the ST's cartridge port. Grabbing sound is just a matter of turning a lead from the phone's socket of Replay to your CD, record, tape or whatever (you can't use a microphone unless you first run it through an amplifier). The software is responsible for converting analogue sounds into digital equivalents and storing the result in the computer's memory.

Sound is sampled at 8-kHz resolution (the range rate for an explanation of this) and at any of eight different frequencies. Sampling frequencies are 5, 7.5, 10, 15, 20, 30, 40 and 50kHz. Frequencies are preset, so you can't choose anything between the provided frequencies. Sounds can be sampled and replaced at any rate. So, you could sample at 10kHz and replay at 20kHz. The result would be a high pitched, Mickey Mouse-like sound.



WHAT'S NEW IN REPLAY 4?

The most obvious improvements over the original Replay are the expanded packaging, thicker manual and revised sampling hardware. The hardware now sports a phone-out socket alongside the phone-in. There-out is for directing grabbed sounds to an external hi-fi for extra quality. With better use of memory, the version 4 software not only looks more pleasing, but it also performs better. The maximum sampling rate has gone up to 50kHz, sample-input triggering is adjustable, low-pass filtering is available (there's a real-time oscilloscope for monitoring incoming sounds), a spectrum analyzer is

included, waveform display is selectable and 12 samples can be held in memory.

You can also sample over an external MIDI instrument such as a sequencer or synthesizer. Real-time frequency (pitch) shifting is possible.

Finally there's inclusion of the Drawtext software. With Drawtext you can load 16 samples into memory - drawn sounds are produced from drums, 16-bit, variable, clip, tempo - and sequence the sounds. Samples can be played back via two channels. Many drum machine facilities are included.

Cross talk

It's not possible to replay samples at 40 or 50kHz through the ST's speaker - that would be asking too much of the system - but going through a hi-fi gives spectacular output.

Along with the usual block copy, merge and delete options, there is provision for filtering sound (high frequencies are removed), reverse playing a sample, fading sound in and out, analysing a spectrum graph in real-time, magnifying the sample graph and viewing the sample graph in colour only.

Since you're happy with a grabbed sound, there is fantastic provision for incorporating digitised ditties into your own programs. Source files in GFA BASIC, HUSH BASIC, Ware

BASIC, FIRST BASIC and 68000 assembler are present and well documented. It's a pity, though, that the routines don't let you replay samples as a background task.

Replay 4 offers virtually everything you might want: sampling, effects generation, MIDI control and even drum sequencing. As such, it is great value compared to similar offerings. The manual lets the user down as it lacks ReadMeUp and is dry reading. Apart from that though, Replay 4 shines.

REPLAY 4

for

- Sampling up to 50kHz
- Drawtext and MIDI software are welcome extras
- Lots of examples demonstrating how to include samples in your programs

against

- Sampling frequencies are preset
- Effects software should be part of main program



MUSIC



REPLAY DELUXE

As if Replay 4 wasn't enough, another new version, Replay Deluxe is coming soon. The hardware will feature a 19.4k analogue-to-digital converter, 12-bit digital-to-analogue converter and anti-aliasing filters. On the software side of things there is provision of full MIDI control, real-time fast Fourier transformations, sample frequency from 5kHz to 40kHz, two and four times oversampling and loads of real-time effects loads, reverb and so on. Price will be £170.

features

1 2 3 4 5

performance

1 2 3 4 5

ease of use

1 2 3 4 5

manuals

1 2 3 4 5

format value

1 2 3 4 5



SAMPLING SENSE

Samples are represented in memory "depthly" in 16-bit numbers. However, stored on-disk are stored in a 16-bit number, so have 65,536 measurable levels... that explains where the term 16-bit sampling comes from. The more levels that can be measured (in the more bits per channel) the higher the quality. Most sampling hardware for the ST and Amiga offers 8-bit sampling, which gives 256 levels.

THAT'S INTERESTING

The author of the AMAS sampling software just happens to be the author of the Display 4 software. And it just happens that the author of the Display 4 software is also the author of the ST Sound Designer software. But most interesting of all is the fact that the author is of three kinds is called F. Samsa. Come on! If you can't see your real name.

performance
ease of use
versatility
format value

AMAS

£99.95 ■ All Amigas ■ Microdeal, Box 68, St Austell, Cornwall, PL25 4YB (0726 680210)

Not another sound sampler for the Amiga! No, but this one purports to have the lot. The hardware - which can connect to the serial or parallel port - offers mono and stereo sampling from either processed or nonprocessed sources. That means you can get sound from your lill (which is generally amplified or from a non-amplified source like a microphone. In addition, there's MIDI in, MIDI out and MIDI thru ports. Then there's the software...

The main screen is split into four parts: memory bank selectors; four sample edit windows; dual master-slaves for left and right channels; display, sampling and volume controls; and editing controls. The 'scopes' work in real time - that is, they display sound information as it arrives.

AMASsing data

From the main control panel it is possible to select left, right or stereo sampling; set the sampling frequen-



cy; monitor and analyse incoming sound; record and play samples; and individually alter the relative of all four output channels. It's also possible to switch off the Amiga's internal sound steering from here. Sound will be considerably less muffled after the filtering is switched off as the sound will have a wider bandwidth. Unfortunately the facility doesn't work with all Amigas as not all

Amigas are built equal!

Editing functions include looping a portion of sample contained in the left channel with that of the corresponding area in the right channel, overlaying samples or top of each other, reversing a sample, fading in and out, resampling and the usual 'stock' operations.

It's possible to compress sample data by 20%, 50% or 75%. If you decided to squeeze a 1.0kHz sample by 50%, you must also reduce the playback frequency by 50% (in this case down to 500Hz).

Data can be saved in either ST or raw format. This means that samples produced with AMAS can be used with a wide variety of other sampling software. This is just as well because no utilities are provided for adding sampled sounds into your own programs. It's unfortunate in a £200 package.

AMAS certainly offers almost everything necessary for sampling sounds and playing the results across a MIDI keyboard. MIDI and sound sampling for under £100 is unreal value value. ■



■ MIDI lets you sample sound in either stereo or mono. Stereo sampling frequency can be anything up to 20kHz; playback frequency is a fraction higher at 23kHz. Eight banks of 2000 can each hold 10 stereo samples - if course.

AMAS

for

- Software loads easy and is easy to use
- Excellent compression and filtering options
- Good range of MIDI utilities

against

- No tools for adding samples for your own programs
- Can only use 65kbytes of memory at most

MIDI AND THE AMIGA

A wealth of MIDI facilities are available from within the AMAS software. The options appear on a control panel over the existing editing panel.

Options exist for assigning samples to function keys, splitting a MIDI keyboard so that more than one sample can be played over the keyboard range, selecting a MIDI channel in the range 0 to 16 and transposing an incoming note either up or down by one octave.

There are several modes of operation: ST MIDI, ST KEY, PO MIDI, F PLAY, ST MIDI allows up to ten piano samples to be played from the MIDI input. ST KEY enables you to play notes, courtesy from the computer keyboard. Up to four more samples can be played simultaneously in PO MIDI mode. F PLAY lets you play samples by pressing the relevant function keys.



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Combine sight and artificial intelligence and you get an idea what the latest technology has to offer - smart machines that know what to do when they see what they like. **MATT NICHOLSON** goes in search of the applications these devices are being used for and discovers uses both frightening and frivolous.

At a recent symposium on biological and artificial intelligence systems the difference between the animal and the silicon kingdom was highlighted by a discussion on how a frog manages to catch a fly. The frog is not an animal endowed with a great deal of intelligence, yet this simple act is beyond even our most powerful supercomputers.

The problem is not so much in catching the fly, but in identifying it in the first place: by the time our computers have managed to deduce that a particular patch of moving light is a fly, the fly would have long gone. Computer vision - the design of computers and robots that can understand visual images - is a very young science, dating perhaps from 1978 when the first book on the subject was published, reporting the Symposium on Computer Vision and Sensor Based Robots held at General Motors Research Laboratory in Michigan. Spot welding and paint spray robots provided the breakthrough for non-sensory robot design from hardwiring the car production line. Robots that could sense their

environment and use intelligent control were the next step.

Applications for such robots are everywhere, taking over mundane or repetitive jobs or working in hazardous surroundings. First generation robots are fine on a production line where every action is pre-programmed to a guaranteed environment, but they are unable to react to changing circumstances because they cannot see. There are already robots on production lines that can distinguish machine parts, randomly positioned and orientated on a moving conveyor belt and detect any irregularities in shape - Conspat, detailed elsewhere, is an example.

Another experimental example uses a TV camera pointed above a tray of randomly distributed chocolate bars. A robot arm equipped with a jacking module is used to decorate the chocolates; the equipment can not only adjust to position and angle but also distinguish between a hazelnut size and a runn traffic by their different shapes.

A rather more specialised area is Optical Character Recognition, or OCR. The ability of a computer to

A PLACE FOR THE 68000

The high-speed analysis of binary pictures, for those grey-scaled images containing information in all three dimensions, involves huge processing power, so it is not surprising that much research is going into the development of systems that use parallel processing and neural network technology. The latest Transputer is the obvious candidate here, nevertheless one of the most popular machines for the researcher is the Sun workstation which uses the 68000 processor.

The Commodore Amiga and Atari ST are really not powerful enough to analyse visual input unless the images are very sparse. Nevertheless Personal Robots Limited, who developed the Atar Robotoid system covered in an earlier issue, is developing a vision system along with other optional robotic extensions for the 68. The kit will come with vision and image processing software, but will not be available until the end of the year. Personal Robots Limited is on (0441) 518001 if you would like further details.

It will be a long time before we can produce a robot like C3PO capable of reliably distinguishing between Star Wars and Princess Leia by light alone.

real printed characters would save an immense amount of time in business, while the ability to read hand writing in the same way that we can read revolutionize the use of computers. Most image recognition systems rely on imposing a known template over the image and looking for a match. The problem is the huge variety of shapes and sizes that are understood to be the letter A, for example, as opposed to the letter B. It is an old familiar with the rather angular characters found along the bottom of a chequer, although OCR software is used. There are expensive machines available that can read a small range of typewriter faces too.

Some research was done at this year a number of years ago by the Home Office, who developed a system that could automatically read car number plates from a camera mounted below a motorway bridge. At first sight this seems challenging, particu-

larly given Britain's excellent weather and the average standard of motorway driving, but remember that number plates are retro-reflective, and so can be highlighted by an infra-red light source mounted near the camera. Such systems do not prove terribly reliable though, and the system is not in use today.

Howey drives vision

A particularly hazardous environment is a battlefield, especially if you happen to be at the end of a missile heading towards its target. The military is obviously interested in computer vision as a method of targeting, but what it perhaps isn't so obvious is that they are also looking for safer for mines. After all, a successful system is completely obliterated the first time it is used - along with the target of course.

NAVY is particularly keen on what is called the Deep Stalker System as an alternative to tactical nuclear



The addition of colour and tactile sensors to a programmable robot arm would be of enormous benefit to industry. This project uses vision systems from Japan's Lead Limited of Tsuzi & Murai to select randomly placed machine parts and put them in a specified position and orientation.

SERIOUS PURSUIT?

Researchers at Portsmouth polytechnic have developed a pair of robots that can play table tennis together. Their next objective is to get the pair to play in the dark. Researchers at the Advanced Robotics Centre in Bedford, development in programming an automatic tennis player. Early prototypes tended to lose the tennis ball as well as the racket...

SNOOKER-PLAYING ROBOT

One of the more famous applications of robot vision is in the robot at the Department of Mechanical Engineering, University of Bristol. It was called 'Rover' by the BBC, during filming for the 1980 program, although the Vice-Chancellor calls it 'Hickadee'. It is the brain-child of Professor Kenneth Brindley-Smith together with researcher Ian Bennett. Completed in 1980, it was put together through 1987 and in February 1988 played against professional player Ted Lowes. "We lost," said Bennett, "but so far so we were convinced we had won".

The aim of the project is to provide a test bed for constructing an Expert Vision System, a concept that has parallels with conventional expert systems in that the aim is to produce an expert 'shell' which could then be applied to a variety of other applications with minimum re-programming. Snooker might seem like an odd choice for the test bed, but in fact it contains many elements that would be found in industry.

The robot uses two video cameras to view, and suspended high above the table to provide

an overall view and one mounted on the mobile arm itself to provide a more detailed picture of the target ball. The cameras are black and white so grey scaling is used to determine ball colour and the table is easily lit by providing infra-light (it is vital that shadows don't confuse the system). Processing power is distributed through the system, with a dedicated automatic vision system using 168000 processors hooked up to an IBM mini using six 8086 processors to control the robot itself.

The main problems were not at all in processing the visual information - determining where the balls are, in other words - but rather in developing software that could make intelligent strategic decisions by learning from previous shots. Snooker player Steve Davis has been helping build up a knowledge base for the system, and much has been learnt about the way a professional works. Steve never plays a ball for his own position on the table, for example, so the robot needs to learn about the player's characteristics as they progress. Pat Black Limited, who created the table, has also provided useful input too.

A variety of specialised languages are used for the software, in particular RAL and IBM's APL, which are high-level languages rather like Pascal. Work is also being done with PROLOG, standing for Prolog (Procedural Reference Language), an extension of Prolog developed by

Dr Jim Baines of the Information Technology Research Centre at Bristol. This was 'fuzzy logic', which allows decisions to be taken even when all the relevant data is not known or is uncertain.

Current talk is that, "Given where I am standing industry can be said to be very 'near-parity'". Sponsors of the department's work include Westland Helicopters, British Aerospace, Rolls Royce, IBM, STI and Ferranti, The Agricultural and Food Research Council in funding projects regarding the use of image-guided robots in the food industry, where there is a shortage of skilled labour. Projects include a robot capable of cutting the meat from a carcass and slicing cooked chicken. The handling of non-rigid objects is another full-game objective.



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ST/ARM 04



reasons for eliminating a tank invasion of Western Germany. The rules in computer vision in two ways. First of all there is the need for a system that can distinguish tanks on a video screen, in particular to be able to distinguish reliably between the radar profile of a tank as opposed to a harmless truck at a range of 200km. Secondly there is the need for a rule that can target reliably.

1024 by 1024 pixels in 16 grey scales or even full colour. There are sensors that can see infrared, radio or even magnetic field strength. However the higher the resolution of the image the more processing power is needed to analyse it - or the larger the memory files.

In many cases high resolution is not needed for the task or an alternative solution, such as 'shrinkwrap

■ The ultimate bio-robot eye - the human eye, on which we rely for 90 percent of our sensory input. The eye is unique amongst our sensory organs in actually doing a lot of the image processing itself before sending the result down the optic nerve to the brain. Behind the retina and optic nerve that make up the surface of the retina is a network of complex fibre cells which each respond to particular types of visual stimuli.



Early radar homing missiles proved successful, but very expensive. More popular now are 'skate' missiles that rotate as they spin through the air, scanning an elevated target in a spiral pattern across the ground. Development takes time, ultimately the goal is not a system that works, but one that flies into the night.

What's the problem?

The problem is not so much in the sensory equipment as in the software behind it. There are a variety of sensors in use these days, ranging from simple linear or area arrays that give a binary readout depending on the presence or absence of light directly below each sensor to high-resolution video cameras able to resolve up to

light', is more suitable. In the second case the scene is illuminated by a carefully designed light pattern, which is viewed by the sensor from a different angle so that the contours of the object obscure the pattern in a controlled way - a popular solution in industry.

To understand the magnitude of the problem, imagine a situation where a series of known shapes of known sizes are randomly positioned on a surface at a fixed distance from a sensor, and that the sensor returns a simple binary image - 0s indicating the presence of an object and 1s if the absence. The first task for the software is to find the edge, using edge following algorithms, possibly after removing any noise from the image using Gaussian filter routines. If the orientation of the shape is

SPEAKING THE RIGHT LANGUAGE

The language most often chosen to implement artificial neural nets (AI for short) is Prolog, standing for PROgramming in LOGIC. This was developed in 1972 at the University of Marseille from the concepts introduced in first order predicate logic. Prolog is used in Prolog systems representing the facts you know about objects and the relationships between them, specifying the rules that govern these elements, and then asking questions about the objects and the relationships. A common example is to input details of a family tree, such as 'Jim is John's brother' and 'Alice is John's wife', and then to ask the program about the relationship between Alice and John.

Prolog is frequently used to build expert systems - knowledge bases containing detailed facts and rules about specialised subjects. Much development work is being done with expert systems because they can give commercially viable a system called 'Prologizer' for example, successfully identified a report of methylobacter in Washington State worth \$100 million. Geologists given the same raw data did not find it.

The other popular AI language, particularly in the United States, is Lisp. Standing for LISt Processing, this is a derivative of Fortran developed in 1958 at MIT. Its job was to provide a language that could process symbols in the same way that Fortran processes numbers. It is also useful for developing expert systems.

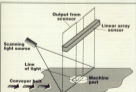
Specialised languages have been developed for particular needs. VCL, for example, is a light-weight video control language developed by Unimation Incorporated which makes the popular Puma industrial robot arm. It includes commands such as MOVE, DELIMIT and LOCATE. However many researchers opt for a standard language such as C/C++ or Pascal® for the speed it affords.

hard from simple template matching might be sufficient to identify the object - this can usually be arranged if you are attempting to read OCR'd text, for example. If the orientation is not known then you could resort to finding the 'skeleton signature' of the shape. The method first using an algorithm to find its centre, and then mapping the distance to the edge all round - a technique used in the chocolate decoration detailed earlier.

But what if the objects are touching? Or even overlapping? Further algorithms have been developed that can hypothesize the whole object provided it contains several occurrences of recognizable holes or corners. But imagine what happens when you introduce depth, so that parallel has to be taken into account; visibility, adding it fixed dimensions inconsistent lighting, so that shadows confuse the viewer and then start moving the sensor relative to the environment, as would happen if the robot got up and started walking around.

All of these problems are solvable, and indeed many have been demystified (solved) in research labs round the world. Systems that can respond to their environment intelligently in a variety of surroundings, and at a useful speed, require very efficient algorithms and very fast processors. Research into parallel processing and neural systems will bring results too.

But it will be a very long time before a robot could walk up to you in the street, gently shake you by the hand and get your name right first time.



■ The Conlight system uses a linear array sensor to read the presence or absence of a line of light across a moving convex lens in a basic 'lateral light' system. From its output a two dimensional binary image of the object is built up out of 'line slices'. Image processing algorithms then work out the part's shape, size and orientation.

RAT RACE

Every year researchers in artificial intelligence meet at British Psychological for a competition. There a mouse is set up and the competitors race robot mice to see which can find the centre first.

DAATASCAN

Getting artwork from paper onto the screen can be a real pain – unless you take the easy way. **BEN TAYLOR** tries his hand with Kempston's new extra width scanner.



£275 ■ All STs ■

Kempston Data, 21
Linford Farm, Linford
Wood, Milton Keynes MK14
5LX (0908 677600)

The trouble with all these fancy graphics programs that the ST and Amiga find is getting pictures onto the screen. Maybe you've got a photo you want to include in a DTP page – or an art package – or you're trying to draw a picture in an art package – sketch it out first, then scan it in and then retouch and color it using an art package. In short, a scanner saves the fiddling about hours of eye-tugging staring at a screen.

Kempston's Daatascan is a hand-held scanner which you roll over a flat image to be captured. It's a nod to the Cameron scanners reviewed in issue 8, the big difference being that the Cameron Handy Scanners will scan a volume 64mm wide. Daatascan will go to 107mm. That's a 60% increase, and it makes a big difference. You can scan normal sized photos easily.



Long range scan

The Daatascan interface plugs into the ST's cartridge port, and a 2 metre lead connects to the scanner itself. The hardware is a re-engineered AMS scanner, so has been reliably supplied to PC users with AMIG's own Firenze DTP kit for some months. There's a start/stop scan button, contrast control, and four scan modes for different types of scan.

Kempston also supply a useful selection of software with Daatascan. First of all is a simple program to control the scanner – you can capture the



text, then save any or all of it as a disk file. A pleasant surprise is that Kempston have bundled Alan's HyperPaint with the package, so you can use this to edit your images, rotate, rotate and colorized to your heart's content. We carried a full review of HyperPaint in issue 6.3. HyperPaint can save in Degas, Macintosh or IFF file format, so you'll be able to convert scanned images for any DTP or art program.

It's no big

The Daatascan hardware works at 300 dots per inch resolution, and you can scan in any ST screen mode. Scanning is always in black and white, whatever resolution you use it. One potential problem is that 300 dpi on a 107mm scan width means over 800 pixels per row, sending three low-resolution screens worth! There are commands to scale the size of the scanned picture down, but no "zoom" commands to give you an overall view without actually altering the picture data.

Another bundled piece of software, "IMAGEBOX", lets you add colours to low resolution scanned images.

All scans are saved in .IMG format, which means they can be of any size, limited only by memory. On a 520K7 you can scan and save a strip about 90 inches long, more on a Mega. Another virtue of .IMG files is that, using HyperPaint, you can load an image saved in one resolution while working in any other.

Verdict

Daatascan is the first ST scanner to offer a 107mm window, and you'll

appreciate the extra width. The results are good, although it would have been nice to have the option of 300 or 400 dpi resolution. Overall, the high quality of the software supplied makes it very simple and flexible to use.



■ As well as scanning straight black and white line images like diagrams (left), Daatascan gives you three "other" scan modes. These provide a simulation of shades of grey so that photographs can be captured with a reasonable quality.

features

1 2 3 4 5

performance

1 2 3 4 5

ease of use

1 2 3 4 5

comments

1 2 3 4 5

format value

1 2 3 4 5

for

- Works in all ST screen resolutions
- Bundled with HyperPaint
- Wide 107mm scan strip
- Length of scan as big as memory allows

against

- Slight redundancy for roller to stop giving horizontal strokes on scan
- No 300 or 400 dpi resolution option



HARDWARE



MAKE IT BIG

512K is fine for games and a few of the smaller serious applications. For really big tasks, though, you need at least a megabyte of memory. And possibly a second drive. The number of games and applications that require loadspower are on the increase, so don't get left behind - make sure you know what you need to get the best out of your machine. RICHARD MONTEIRO looks at what's available.

RAM UPGRADES

It's worrying, the number of packages that require 1Mbyte of memory or more to run. On the CD games front there isn't anything that exceeds 1Mbyte, but there are several games that can benefit from extra memory. The games either load completely into memory thus removing disk swapping or provide better sound and graphics. For instance, Counter II has an excellent interaction sequence when played on a 1Mbyte machine and Typhoon, which comes on two disks, loads completely on a 2Mbyte machine.

Amiga 1Mbyte-only games sold for the Amiga Dungeon Master and Dragon's Lair. There's promise of polygames.

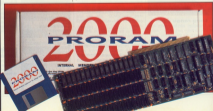
As for serious applications, of the desirable software needs at least 1Mbyte. For example, Allegit, VIP Professional and Cyber Paint 2 on the ST, Professional Page, Corel Letter and Deluxe Paint on the Amiga.

It's very likely that many more 1Mbyte software titles will be launched this year, and perhaps even 2Mbyte packages. Amiga's third release of Calamus, Microscope 3D 2 and PlayStation. Of course, additional RAM isn't good just for running powerful software. It's useful for

installing large RAM disks (to aid file copying), having memory hungry Desktop accessories alongside other applications or running lots of tasks simultaneously on an Amiga. So what do you do about the situation? You could forget about it and miss out on some very nice software. Or you get yourself a RAM expansion board.

PROGRAM 2000

£229 unpopulated ■
Amiga 2000 only ■ Amiga
Centre Scotland, 4 Hart
Street Lane, Edinburgh
EH1 3RH (031-557 4242)





to 32Mbit internal RAM expansion for the A2000. Definitely one for power users, and those with large estates. FutureRAM is provided unpopulated, and is upgradeable to 256Kbit increments up to the maximum 32Mbit. The board makes use of 18bit DRAM chips; so it will cost you around \$400 for every 256Kbytes of memory you add.

FutureRAM will work with any mixture of 18bit DRAM chips. Built around a 68000, it's available and very considerably from dealer to dealer. At the time of writing, the Amiga Centre Scotland could supply 18bit DRAMs for £24.15. Adding the chips to the board is easy enough if you take care handling the RAMs. Static will destroy the chips — and it costs £25 per chip you simply can't afford to screw things up. Get a dealer to fit the chips, you may get charged a small fee, but that's peanuts compared to blown RAMs.

With the RAM installed, it's just a matter of carefully entering some jumper leads. There isn't the expansion board actually how much memory it has, either 0, 2, 4, 8 or 16Mbytes.

The Prohibit board can sit in any of the five standard 28pin slots inside the A2000. Before replacing the A2000 cover, it is wise to run a diagnostic test. This, along with other utilities, is provided on a disk. A disk must be removed from the board for the testing software to run. This must be replaced before using the Amiga normally. The software will check the board and RAM, suggest memory banks and chip locations will be displayed. If you really must know, the checks include rotating bit, bit alteration, writer and erasure.

A removable RAM disk program is also included (there's one as standard in the new Workbench 1.3 anyway.) This works in much the same way as the standard Amiga RAM disk with the exception that any data held in the RAM disk remains intact after a reset. However, a bug in Workbench 1.2 means that the controlling software will destroy the contents of the extra 32Kb memory in an A2000 located at 200000h (and, regardless, if the removable RAM disk places any data in this area, that may be lost during a reset).

FutureRAM is a wonderfully engineered board. It sits inside the A2000 out of sight and out of mind. It is virtually identical to Commodore's A2095 RAM expansion board, but sends no messages into the chips for no more than £100 each.



312K EXTENSION CARD

£19.99 unpopulated, £34.99 with clock, £100 extra for RAM ■ Amiga A500 only ■ Datel Electronics, Fenton Industrial Estate, Govan Rd, Fenton, Stoke-on-Trent, ST4 2RS (0782 744707)

Datel's 312K extension card for the A500 comes in various configurations. Some standard unpopulated board. Battery-backed clock/stander unpopulated board, standard populated board and battery-backed populated board.

Underneath your Amiga 500 you'll find a panel, ensuring this means a 31pin connector which is where the expansion board sits. Simply fit the board into place and turn on the

machine. It's that easy.

The board is fitted with a switch for turning the extra RAM on or off. A small percentage of games don't work with the extra RAM installed — Hollywood Star Force for instance — consequently the switch comes in handy for deactivating the additional 312K memory. It is necessary to power off the Amiga before taking the switch.

Instructions are provided for installing and setting the clock — although the literature is present in the Amiga manual, it is tricky to find and not well explained. Good one. Datel. The board tests well, makes contact in various modes (to suit individual's pockets) and is cheaper than Commodore's expansion interface.

312K EXTENSION features	4.5
ease of use	4.0
manuals	3.0
format value	4.0



Probably the cheapest 312K expansion board for the A500 is Ashcom's 312K card. It's the one you look at the month's cover in working to see if the board's also more 312K RAM expansion is that it plugs into the port underneath the computer. Ashcom's board costs £99 (it's fully populated, but there is an optional blank option). Details from 32 The Green, Ashley-de-la-South, Letchworth, LG8 5AJ (0582 431488).

DRAM, STATIC AND CHIPS PLEASE

There are two main types of memory chips used by the 32 and Amiga machines. 18bit DRAMs and 28bit DRAMs. 28bit/32bit dynamic DRAM chips have 16 pins, eight bits in a byte memory. You need eight of these chips to provide 320Kb of memory. A 16-pin static chip that 32 28bit/32bit RAM chips will also make up 320Kb of memory.

Dynamic RAMs are slower than static RAMs, but consume less power and are cheaper. Early computers like the Commodore PET and 15000 didn't have much memory and hence used the more expensive static RAM. Today's crop of computers — including the 32 and Amiga — use dynamic RAMs. Dynamic RAMs are the expansion — they lose their contents very quickly unless they are refreshed.

Dynamic RAM chips are available in numerous speeds, meaning how fast a byte can be fetched out of memory. Speed is measured in nanoseconds (billionths of a second). 100ns to 200ns is typical. Faster chips cost more and you don't always get performance improvements when using them. Hunt around before buying RAM chips, prices are so volatile and vary considerably from deal to dealer. Following is a list of RAM prices from various suppliers and dealers at the time of writing.

SUPPLIER	DRAM	DRAM TYPE	PRICE
Amiga Centre	021 542 4742	18bit	£24.15
Commodore*	0408 770088		
Electronics	0508 204884	28bit/32bit	£5.00
Decepticon	0508 204884	18bit	£25.82
Mapin	0792 954944	28bit/32bit	£7.85

* Yes, Commodore can supply RAM chips. But, yes, there are nobody at Commodore that could come with any further details.

PROGRAM	
features	3.5
ease of use	4.0
manuals	4.0
format value	3.5

Talespin

BY MARK HEATON

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LARRY PULPER

WHAT IS IT? Talespin is a package which allows the combining together of drawings, text and sounds into a series of pages together to form an interactive story, guide or reference. It also enables you to bring the scenes on the drawings page back. You can use it to create flexible interactive around programs made. Talespin can eventually become a story and story-maker, requiring no programming abilities to use. It works on a program level for operating Macintosh, Amiga or IBM platforms and also requires CD-ROM or Amiga 4.0 or A.I. system software licensed. The cost of retail is around £29.95 and the program is available in both print and CD-ROM. It is available in all major computer stores and also on CD-ROM. It is available in all major computer stores and also on CD-ROM.

of words or any form, the copying of drawings and sounds from within the 'drawing' to other files allowing the spreading of a story or reference across several disks, and the provision of 'Drawmaster', which allows the user to save or to reformat for presentation purposes.

WHAT DOES IT DO? It can be used to create interactive adventure games, for guides, stories or reference. It is flexible to create a wide range of scenes, or produce something similar. It can be used to create a wide range of scenes, or produce something similar. It can be used to create a wide range of scenes, or produce something similar. It can be used to create a wide range of scenes, or produce something similar.

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Use your favorite drawing and program (either in an animation or graphics program) to create your own program or reference material.

Talespin comes with a special drawing display program called 'Toldit' with the use of which you can program or alter these in pictures.

COMPLETE AND COMPATIBLE HARDWARE

The manual comes in a complete format with a wide range of 'how-to' drawings and also a comprehensive reference guide.

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two drives for the price of
one. You can use the second
drive for backup or as a
second drive for your
operating system.

on disk organization if you can't see
why this should be useful.)

Developers and teachers will love
this drive. You will be able to find
drives for around £300, but an extra
£20 for a few flashing lights isn't too
suboptimal. Just one complaint: the
documentation is in German!

TRACKER

features	3.5
ease of use	4.5
manuals	0.5
format value	4.0

MINI DRIVE

£84.99 ■ All STs ■ 512K
Software, 2-4 Oxford Rd,
Manchester, M3 5QA (061-
228 1831)

A2000 and A3000 Amigas can power
up to three external disk drives before
any extra power source is required.
Given the A2000 can support one external
drive on its own. No such luck
with the ST though. If you want to
attach an external drive to the ST,



■ Look to power supply! The Mini
drive gets its power from the joystick
port. This means you can't play the
majority of games while the drive is
plugged in.

INTERNAL 1MBYTE DRIVE UPGRADE FOR ST

Early 500 KHz PCs have a single sided internal drive. The ST operating system
can handle the double sided variety, so it makes sense to upgrade to disks
formatted with three drives (more than the storage capacity). Single sided
drives provide 1000 storage units double sided drives manage 2000. Don't
get confused by the term '1Mbyte drive'—this indicates the total amount of
storage on a double sided disk before formatting.

Replacing the internal drive on an ST sounds daunting, but it is far easier
than adding extra RAM. The first task is to remove all the screws from the
interior of the computer. Turn the computer on its side and remove
the bottom half of the case. Lay the machine on a flat surface and locate
the disk drive — it's attached to the motherboard by a length of ribbon cable.
Unhook the cable from the disk and remove the drive.

Locate the new drive (and upgrade it to the cable just removed from the
old disk drive. Reattach the casing and the screws, and you are done. A
1Mbyte internal disk drive. Easy really.

Datal Electronics (0782 344707) can provide you with an appropriate
drive. Cost is £79.95.



then the drive must have its own
power supply. Because of this, Mini
drives are generally more expensive
than the Commodore equivalents.

Here's one for the books: an ST
drive that needs no extra power. It
gets all its needs from the computer,
but it doesn't do it using conventional
techniques. The Mini drive gets its
power from the joystick port! Whether
this is a good idea or not is debatable,
but the drive and ST work happily
together. The joystick port was
never meant to be used as a power
source, so there could be a detrimen-

tal effect to the machine over a peri-
od of time. Sure, naturally, there not.

The Mini drive is questionable
value for money, the cheapest you'll
find. What is questionable though, is
its effect on the ST.

MINI DRIVE

features	3.0
ease of use	4.5
manuals	na
format value	4.5

OFFICIAL COMMODORE AND ATARI DRIVES

■ You may be able to get external drives cheaper from third party
manufacturers, but they won't match the styling of your computer.
That's the only advantage of getting the official drive; it comple-
ments your system rather than sticking out obviously. You pay
for portliness. Commodore's 83048 3.5" drive — styled to fit neat-
ly in the A2000 rather than the more recent Amigas — costs
£249.99. If you prefer to add an internal drive to the A2000, then
that unit will cost £169.99. Atari's second drive weighs in at £249.
It looks good, so it's a buy 5!



FAST UPGRADE FACTS

There are many suppliers of RAM boards and second disk drives for the ST
and Amiga. Naturally not all could be internal only (internal models). If you
look around you might find better deals than the ones reviewed. Here's a
very incomplete list detailing some of what's available:

PRODUCT	PRICE	SUPPLIER	PHONE
Amiga 3.5" drive	£79.97	Aprom	0181 520462/2028
Amiga 3.5" drive	£75	Micro	0454 587712
A2000 Superdrive 1	late	Proble	0402 40740
Amiga 3.5" drive	£85	Power Computing	0204 078000
A2000 internal drive	£75	Power Computing	0204 078000
ST 3.5" drive	£80	Power Computing	0204 078000
Amiga 3.5" drive	£74.95	Fireball	0288 769500
ST 3.5" drive	£80.95	Fireball	0288 769500
8128 Amiga-RAM board	£2.99	Power Computing	0204 078000
Amiga RAM Superboard 1	£299.95	Star Software	05-888 4188
CAP 500K Amiga board	£151.29	MS Marketing	0895 444455
A1000 board	£291.99	MS Marketing	0895 444455

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GOLD DUST

STEVE GOLD, stateside supermole, reports on ST and Amiga developments occurring the other side of the great puddle. More upheavals in the Commodore hierarchy, Atari prospects at Hannover, DNIC isophole closed and news of new Mac emulators.

future ahead of it.

Not Hannover

All eyes are on Atari and what 'Big Jack' has lined up for the Hannover fair in March. My sources tell me that Atari is planning to show, but still announce firm pricing and delivery dates, of its much-touted 68020-based machines.

Reportedly, the machine is running (as of mid-February) and comes in a PC-AT style cabinet. Engineers at Atari's Computers, California, headquarters have managed to get Unix v1.3 and OS/2 version 1.4 up and running

on the machine.

Back in the US, meanwhile, and the Michigan Atari Computer Enthusiasts (MACE) have been getting tied up with the lack of US stores at which Atari goodies are available. So tied up, in fact, that they've planned their own show—the Michigan Atari Computer Exposition (MACE).

MACE's MACE will be held at the Detroit Metro Airport Hilton on the 6th and 7th of May, 1988. The show promises to be worth a visit if you're in the US around this period. According to Flitter Bay, the convention coordinator, more than 40 stands have been booked by

developers, retailers and dealers, all of whom plan to make the show worth traveling to from all over the US.

If you're planning to be in the US for show, give Flitter a call on 0100-313 908805. She has negotiated a 40 per cent discount with Northwesters Airlines for showgoers, as well as a \$55 a night rate of local hotels — not bad, when the standard rate is \$127 a night. Further details of the convention can also be obtained by writing to: The Michigan Atari Computer Expo, MACE, 3487 Broadway Circle, Ann Arbor, MI48106, United States.



■ Schedule for a Plethora roll-out (with a 68020 based) is planned in an update of Wherperfect 4.1 for the ST. Sources originally had called that Wherperfect 4.0 were covering 68010 development of the package. This will hold true, but the improvements stem from work on other versions. Wherperfect 4.0, as the new version has been dubbed, will ship during April in the US and Europe. Enhancements shown in development and announcements to date include allowing the 705 6.4 base selectors to be used.

There's a spot of mixed news for UK users of Computers, the giant data database in the US. As of 31 January this year, links between mainUS 3.25 networks and the Computers network in the US have improved, with faster response times available from Compex. The downside of the upgrade is that international subscribers are now charged at the correct tariffs.

Previously, international subscribers accessing Computers using the Destination Network Identity Code (DNIC) of 49-0132 were charged at the default 300 bit rate of \$4 an hour. Today, subscribers accessing at 1,200 and 2400 baud need now pay the full rate of £12.50 per hour.

All change

It's been a busy month on the Commodore front. In the US, we're two years after the departure of Thomas Rutledge, a new man — Mark Al — has been appointed as president of Commodore International.

All has been in the background of Commodore UK for some months, acting as a consultant to the company, and generally working being found, Commodore's top dog. A minor shake-up at Commodore Europe occurred in parallel with Al's appointment: Harold Spitzer, the senior European manager with General Anderson, abruptly left the company. According to Anderson, who effectively becomes general manager of Commodore Europe Limited (CEL), Spitzer's departure was amicable, and he will continue to assist the company on a consultancy basis.

The planes Christian Anderson is a provider of considerable peace, with Steve Franklin and the rest of Commodore UK effectively reporting to him for day-to-day decisions on the management of Commodore UK. Shortly after Spitzer's departure, Anderson told me that titles within CEL are for formal purposes only. This raised all sorts of management issues, and indicates that Commodore UK has a great

MORE APPLE MAC EMULATORS ON THE WAY

On a slightly different topic, regular readers of this column will probably be familiar with the existence of an Apple Mac emulator for the Atari ST, that has about one for the Amiga? Yes, Dave Small of Data Pacific, and the Space War emulator creator for the Atari ST is working



an ST/Amiga/Mac triniche emulator called Hypernet, but this project is still some way off from completion.

And then there's a 68020 based, Ready2Go, may go Small to the point on the Amiga front where it should have a unit called AMAX available. AMAX is a software/hardware combination that allows Mac and Mac Plus software to

be run on any Amiga. AMAX plugs into the external disk drive port on the Amiga via a supplied cable.

As with Dave Small's Mac emulators for the ST, you'll need to find a source of Mac 68k or Mac Plus 128K ROMs for the AMAX. You'll need a Mac 8008 external drive to be able to load Mac Plus software; AMAX can quite happily take an external Amiga drive on its pass-through expansion slot.

According to the Unpop Amigan online resource (available on several US BBSes), the latest version of AMAX works well using an interface of 640 by 480 pixel mode. Most Mac functions — in particular, remember — will run under AMAX, including the parallel and serial ports. The Unpop Amigan reports that you can even hook up an Apple Laserwriter II or Laserwriter IIx prior to the Amiga with excellent results (says John Scaley how about that?) — Ed.

Version 1.0 of AMAX should be out in the US at around \$150 by the time you read this. The last news is that hard disk, multi-tasking and AppleLink networking support has yet to be implemented. Upgrades will be available at free or nominal cost, however.

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DISK EXTRA



ST Amiga Format's unique dual format disk gives you the best of both **ST** and **Amiga** worlds! Whether you're a joystick jockey or a machine code maniac, **JASON HOLBORN** takes you through the month's goodies.

ST

How to the ST? See page 40 for full loading details

34 CAR

WICKIACKEN

If you thought the Sunday Sport was bad, discover the truth about criminals with *Wickiacken*'s early episode of the Fleet Street look. Don't just read the news, enjoy the drama and then try it for yourself.



36 H80SOFT

So you want to learn Assembly language programming files, *H80Soft* is Amiga's on-line tutorial, and here's all the software you need. *H80Soft*, bring you the king of all assemblers, the ever popular *DevPac*.



38 ADDRESS BOOK

Do you fancy yourself as bit of a pugilist? With this handy address book, you can keep track of all the best wine bars, hot air balloons and even your local portable telephone engineers.

38 EDITTEXT

Everyone needs a text editor, programmers, writers, even your father is a text and powerful editor that can be used to produce anything from a get-to-the-bottom letter to your Mother-in-law, to the program code of your all-kill Amiga game.



38 LABEL EXPERT

Is your disk collection getting out of hand? How about your video tape collection? You need to get organised, mate, and we've got just the program. With *Label Expert* and a printer, you can have wonderful labels in a matter of seconds.



AMIGA

How to the Amiga? See page 40 for full loading details



34 CYBERNOID 3 DEMOS

Get your hands dirty on the complete test

level of Haverhill's latest blockbuster game, *Cybernoid 3*. Real action, compelling gameplay, superb effects, they're all there in this multiload mega game.



37 DEVPAC

Of course our Assembly tutorial isn't just for ST owners: here's the Amiga version of *H80Soft DevPac*. Join the likes of *Joe Sam*, a fan

use user of *Devpac* and get into true power compiling with this development system.

38 PRINTTEXT

Have you ever found a stray text file floating around on a disk but you just can't figure out how to read it? Well *PrintText*, you'll never again be left in the dark at those enigmatic words of wisdom will be yours for the taking.





ZAK: THE FULL VERSION

Does life as a virtual reporter working for the gutter press appeal to you? If so then you'll be pleased to know that the full version of Zak McKracken is available for only \$24.95. Read our review in the *Sourceplay* section this month.

CYBERNOID: THE FULL VERSION

Impressed by our mega demo? You'd be hard-pressed not to be! You can buy the full game for only \$24.95, or even less from our special offer pages. So get it... you won't be cheap!



For Zak McKracken, it's just another day at the office. He's the evening reporter who's scoffed at his peers, cheated by his editors and rebuffed by readers of his tabloid sleazebag. Zak is just the kind of guy you'd expect to find slacking down flipping maps, camera focused and at the ready, just waiting to catch somebody



■ Zak wanders aimlessly in the wilderness.

famous doing something that perhaps they shouldn't be doing and then returning to his office typewriter to take the story totally out of proportion.

But one night in fact, Zak McKracken uncovers evidence of an extraordinary plot and writes all the other alien conspiracies that his tabloid churns out with regularity, this one is for real!

You can join Zak on his quest to thwart the alien invaders with this month's mega game demo. The copy on our cover disk is a demo in which Galt will give you a guided tour around his crazy world. Play Zak McKracken (and the Alien Mindbenders) and the Sunday Scoop will seem almost tame in comparison!

Getting Going

You can enter the world of Zak McKracken by double clicking on the ZAK.MPG icon on the Desktop. Don't worry if the demo seems to take a long time to load; there's quite a bit of data being pulled in from disk!



■ Just look at those strange chappies!



If it's a hardened game, I've seen them all and played them all... no game gets past my sceptical Sn, you think you've seen the very last word in games, do you? Not until you've played Hewson's latest mega block



■ You're under heavy fire and unless you move quick, you're going to be history just!

buster *Cybernoid 2* you haven't!

Cybernoid 2 is, not surprisingly, the follow-up to Hewson's mega successful cult classic, *Cybernoid*. Version 2 has already gone down a



■ Look at the state of that wall paper!

treat with first gamers, and it has been receiving rave reviews from top games magazines such as *Format*. With a recommendation like that, how can you go wrong? Still not convinced? Why not see for yourself why it is causing such a stir in the games world by playing our exclusive demo.

The plot behind *Cybernoid 2* has you up against a motley crew of space pirates that return to smash their bridge revenge after you banished them to eternal torment in space. Several minerals that are vital to the survival of your planet have been stolen by the space pirates and it's up to you to retrieve the oh-so-valuable minerals.

Getting Going

You can load this amazing playable demo by either clicking on the *Cybernoid 2* icon on the Desktop, or by entering your cover disk at the lowest Workbench screen when you first turn on, in which case the disks will automatically load. During loading, the screen will flash wildly and do all manner of strange things, but don't worry, your machine isn't doing the dying fic; this is just Hewson's oh-so-clever loading system doing its stuff!

To play the game, you'll need a joystick plugged into cybernoid port 2 and then just press the fire button to start play. To access edit weapons, just press the function keys.

ST and AMIGA

DEVPAC

PROGRAM by HSOFT

WORKING AS STs and Amigas

FILES (AMIGA): GENMM, MOVMM, DEVPAC.DOC

FILES (ST): GENMM.PRO, MOVMM.PRO, MOVMM.TOL, MOVMM.BSC, DEVPAC.DOC

There is one subject that's bound to start an argument among a group of programmers: It must surely be the GO chartist. Which is the best programming language? Some argue strongly for the merits of C, others write on about how wonderful Modula 2 is, and occasionally there are odd mentions of such languages as COBOL and FORTRAN that look carefully at among that group you'll often find an individual who justifies the former, switching on and quickly citing in themselves, you've just spotted the amateur programmer (that, they're stoned out of their minds). Ed.

No matter how fond other languages may



The GENMM editor in action. See select **ASSEMBLE** from the pull-down menu and your program will be assembled into upper-lower machine code.

Getting going with Devpac

The Devpac development system comes in two parts: the GENMM/ST editor/assembler and the MOVMM/ST monitor/debugger. You can load the DevPac assembler by clicking directly on either

require you to use at least one, and most probably both of the two Devpac tools. In GENMM/ST you will first enter your code and then assemble it to disk. To test your program, you would then exit GENMM/ST and then run the program directly. If or should that be when your program fails to work properly, you would then load it into the Devpac Monitor/Debugger, MOVMM/ST. Full instructions on the complete use of Devpac, including a sample tutorial are included within the Devpac folder. This is most definitely recommended reading if you wish to get the most from this amazing program.

If our case-study program has whetted your appetite and you'll like to get your hands on the complete documentation, then for only £25 you can get the absolute 100% complete package, including a manual in a rather attractive ring binder. See this month's Special Offer pages for details.

If you're, for the more advanced users among you, HSOFT also produce an upgraded system in the form of Devpac version 2 for only £58.95. Devpac version 2 features an integrated edit-assemble-debug environment.



GENST assembling a simple program. In a matter of seconds, your source code is turned into ready-to-run machine code. By clicking the mouse in the output channel for the assembly listing, you can see your assembler program displayed next to its machine code equivalent.

try there is just nothing that can touch assembly language in terms of speed and power. When you write a program in assembler, you are writing it in the fastest language available. Unfortunately it can be a difficult language for beginners to understand, but once grasped, you'll never look back!

This month sees the start of a great new programming series that aims to teach you how to write programs in this powerful language and to give you the ideal start. Format and HSOFT have joined forces to bring you the complete version of HSOFT Devpac 1. The only reason from our cover disk version and the commercial version are that you don't get a manual in a rather posh ring binder, just a jolly little text file.



The Devpac assembly dialog box. Enter the output filename and the destination for the assembly listing and you're away.

the GENMM or GENST icons, depending on which machine you have. Brief instructions are available within the Devpac folder; these should be adequate to get you churning out your programming masterpieces at a rate of knots.

Writing a machine code program will



If your program going out to lunch with the Euro or bombing the Desktop? Load it into the Devpac debugger, and you can see goodbye to those bugs.

ST

EDITEXT

PROGRAM
By M. O'Sonnell
MACHINE:
All Colour STs
FILES: EDITEXT.PRG,
EDITEXT.DOC.

Every now and then, as at Format, publish a program on the cover disk that requires you to create or edit a text file. We hangman and Message Writer programs from a couple of issues back are examples. How do you do this if you haven't got one of those expensive word processors? Answer: you can't.

EdText is a comprehensive text editor that includes many useful features that you're come to expect from a machine as powerful as the ST. Even though EdText does have some powerful functions such as extensive block markup labels facilities, speed is not sacrificed, as it usually the case, and you can dial around your text file at considerable speed. EdText is also beautifully easy to use so you'll be up and running in no time.

All the functions in EdText are accessible

from the function keys in a similar fashion to that made famous by the excellent editor provided with GFA BASIC. As with all programs of this type, experimentation is the best way of getting to grips with it.

Getting Going

You can load EdText by double clicking on the

EDITEXT.PRG icon on the Desktop. Full instructions are available in the EdText folder. Why not try loading the documentation file into EdText as your first step with this excellent program. To load the instruction file, select LOAD by pressing [SHIFT] + [F1], and then when the GEM file requester pops up, select the file, EDITEXT.DOC and click on LOAD.

The screenshot shows the EdText interface with a menu bar containing: Load, Save, Delete, Clear, Quit, Repeat, Repeat, Lines, Bold, Underline. Below the menu bar, the text reads: "EdText Text Processor instructions - Copyright (c) 1989 Mike O'Sonnell". A dialog box is open in the center with the text: "EdText Processor will save discarded characters other than ASCII characters with a just word files may be lost. Any lines longer than 79 characters are". At the bottom of the dialog box are buttons labeled "YES" and "NO".

EdText in action. Here, the EdText instruction file is being edited.

ST

LABEL EXPERT

PROGRAM
Public Domain
MACHINE:
Mono-STs only
FILES: EXPERT.PRG,
EXPERT.DOC

Getting all these ST users? This month's Format cover disk has another really useful program just for you: information junkies. This needs no explanation, but brief general advice when you've got a monitor that is so tiny on the eyes. Forget your 912 colours, give me beautiful mono any day!

Everywhere you go these days, there is always someone trying to get you engaged. You walk down the high street and a salesman offers you a Mofax, you step into a shop and the shop assistant wants a portable computer in your face and then you buy Amstrad and even we are trying to give you address book programs. Now our latest offering: a program to get your disk collection organised. Enter the Label Expert.

Label Expert is a powerful program that will allow you to produce a neat array of different labels and then have the results printed on a standard 80mm dot matrix printer. You can create labels for floppy disks of all sizes, video

cassettes in both VHS and Beta format and other miscellaneous items that are in dire need of getting organised.

When Label Expert first loads, the first thing you must do is choose the type of label you wish to produce. This is achieved through two pull-down menus. The first menu is for the more common labels that you are likely to require and the second contains more specialist sizes. Once you've chosen the label type, a data entry screen will pop up which allows you to enter all the text that will appear on the label. For example, if you are producing a disk number, this of programs on the disk and whether the disk is single or double sided. Once all the data is entered, the resulting label will be displayed on the screen and you will be asked if you want the label printed... and that's it. What could be easier?

The screenshot shows a data entry screen for Label Expert. It has several sections with labels and input fields. The sections include: "Disk Number", "Programs on Disk", "Single or Double Sided", "Printer Name", "Printer Port", "Printer Mode", "Printer Paper Size", "Printer Font", "Printer Font Size", "Printer Font Style", "Printer Font Color", "Printer Font Weight", "Printer Font Underline", "Printer Font Strikethrough", "Printer Font Shadow", "Printer Font Outline", "Printer Font 3D", "Printer Font Relief", "Printer Font Embossed", "Printer Font Beveled", "Printer Font Etched", "Printer Font Stamped", "Printer Font Screened", "Printer Font Dithered", "Printer Font Grayscale", "Printer Font Color Map", "Printer Font Color Key", "Printer Font Color Bar", "Printer Font Color Wheel", "Printer Font Color Chart", "Printer Font Color Table", "Printer Font Color Grid", "Printer Font Color Matrix", "Printer Font Color Array", "Printer Font Color Vector", "Printer Font Color Matrix", "Printer Font Color Grid", "Printer Font Color Matrix", "Printer Font Color Grid".

Just enter the label text into the data entry screen and Label Expert will do the rest.

Getting Going

You can load Label Expert by either clicking on its icon on the Desktop. Instructions are available within the Label Expert folder although we're sure you'll agree, you don't really need instructions for a program that is as easy to use as this.

The screenshot shows a printer preview window for Label Expert. It displays a sample label with the following text: "Disk Number: 1", "Programs on Disk: 1", "Single or Double Sided: Single Sided", "Printer Name: Jorg Trojan", "Printer Port: Parallel", "Printer Mode: Standard", "Printer Paper Size: A", "Printer Font: Helvetica", "Printer Font Size: 12", "Printer Font Style: Normal", "Printer Font Color: Black", "Printer Font Weight: Normal", "Printer Font Underline: Off", "Printer Font Strikethrough: Off", "Printer Font Shadow: Off", "Printer Font Outline: Off", "Printer Font 3D: Off", "Printer Font Relief: Off", "Printer Font Embossed: Off", "Printer Font Beveled: Off", "Printer Font Etched: Off", "Printer Font Stamped: Off", "Printer Font Screened: Off", "Printer Font Dithered: Off", "Printer Font Grayscale: Off", "Printer Font Color Map: Off", "Printer Font Color Key: Off", "Printer Font Color Bar: Off", "Printer Font Color Wheel: Off", "Printer Font Color Chart: Off", "Printer Font Color Table: Off", "Printer Font Color Grid: Off", "Printer Font Color Matrix: Off", "Printer Font Color Array: Off", "Printer Font Color Vector: Off", "Printer Font Color Matrix: Off", "Printer Font Color Grid: Off". At the bottom of the preview window are buttons labeled "PRINT" and "MENU".

The finished label is at its glory. All that now remains to do is to print it, cut it out and then stick it onto the object you wish to label. If you have problems attaching the labels onto disks, we recommend the 3M spray mount for paper which will do the job wonderfully!

BAAL



BAAL

- An addictive mixture of strategy and arcade play featuring:
 - 1-way ultra-smooth scrolling through 3-dimensional domains containing multiple games
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 - More than 100 monsters and 400 traps

Inclusion of the word 'Baal' in the hands of an elite warrior, you are the leader of the Fate Warriors. Can you save the earth from the evil BAAL?

The only of yours have stolen an awesome weapon of destruction, a Beta-Blastor, the leader of the ultimate Future Fighters, you need to rescue BAAL, to destroy Fighting all the historical danger! Beware to capture the Fate Warriors... but... you must kill BAAL in the process.

Can you succeed? There is no option... the destruction is totally 'set on Earth'!

Screen Shots from the Amiga SP version
AVAILABLE NOW ON THE PVC PLATED LABEL

CAPTAIN FIZZ



CAPTAIN FIZZ Meets The Doctor From

The message is simple - an assassin or die! It's a hectic fun and double trouble on the way to Captain Fizz. The third person, a real-time-time action game you will experience on a high speed platform, in both of your take on the main, Ballistic! (http://www.ballistic.com)

This is a single-screen design, but you might not wish, you need, the high ability of the other balls. (http://www.ballistic.com) ... and so on. The screen is fast and fun with Captain Fizz, but it's not that easy to get the ball to stop in both the first step.

There are 23 levels of unique and exciting action to take through before you reach your ultimate, the special mission that's waiting for you at the end. You'll find and take through various, you put your hands together with your own, your own... (http://www.ballistic.com) ... and so on. The screen is fast and fun with Captain Fizz, but it's not that easy to get the ball to stop in both the first step.

Warning: This game is impossible to be on your own.

Two systems required for this action game:
**Screen Shots from the Amiga SP version
AVAILABLE NOW ON THE PVC PLATED LABEL**

BALLISTIX



BALLISTIX The ultimate new ball game!

One of the best games? The best of games... (http://www.ballistic.com) ... and so on. The screen is fast and fun with Captain Fizz, but it's not that easy to get the ball to stop in both the first step.

The game of the game is simple, you must play that you can play it in a different style. In the first step, you must play that you can play it in a different style. In the first step, you must play that you can play it in a different style.

Warning: This game is impossible to be on your own.

Two systems required for this action game:
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Coming soon for C64, Spectrum, F.C.**

**BALLISTIX
Amiga/Vast 01 - £19.95**

747 CLASS

ST ADDRESS BOOK

PROGRAM:
By P. MacGregor
MACHINE:
All Colour STs
FILES: ADDRESS.ACC,
ADDRESS.DOC

G of Organized! That's the buzzphrase of the 1980s. Everyone, from school teachers to lawyers, from computer users to armchair breeders is jumping on the Mac software bandwagon as never and those companies brand new are instant solutions to the age old problem of tedious memoranda (that's forgetting things, in case you aren't a fluent Latin speaker).

Address Book is, not surprisingly, an elec-

tronic address book that will allow you to keep track of all those important names and addresses, never again will Andy Sorte nag you for not phoning her! You can keep track of the name, address and phone number of all your acquaintances from the enjoyable program.

Goat of the details of your friends and



■ Address book is active. Not quite a Rolodex (but then, you can't play Populous on one of these!)

acquaintances are entered, you can locate any one of them in a matter of seconds using the extensive search functions available. You can search for an individual name of your view all names that begin with a certain letter of the alphabet.

Getting Going

Address Book is a Desktop Accessory and can not therefore be run by double clicking on its icon on the Desktop.

To use Address Book, you must first copy the file, ADDRESS.ACC, and all its associated files listed in the file box to the top directory of your hard disk by dragging their icons across onto the floppy disk icon. Once all the files are copied, insert your ST with your boot disk in the internal drive and Address Book will be loaded into the Desktop. To run Address Book, move the mouse pointer up to the Desktop and a menu will drop down. Select Address Book from this menu and the program will load. Full instructions on how to get the most from this excellent program are included within the Address Book folder.

AMIGA

PRINTTEXT

PROGRAM:
Public Domain
MACHINE:
All Amigas
FILES: PrintText

Have you ever got hold of some Public Domain software and been told to read the README file, only to find you can't see any text file on the disk? Frustrating, isn't it? Usually, the file will be there, but the programmer hasn't bothered to define an icon for it so you just can't see it from the Workbench. Unless you're adept at handling the CLI, you're stuck. Well now.



■ Just look at all those features! You can print the text file and even display a standard PP picture.

PrintText is a very handy text file viewing program that will allow you to uncover the contents of those elusive rogue text files. PrintText works in a similar way to a standard Word Processor or text editor so it allows you to move through the file with ease with the usual click of a mouse.

A further advantage of PrintText is that it will also allow you to view standard PP picture files with ease; how many Word Processors and text editors allow that?

Getting Going

You can load PrintText by double clicking on the PrintText icon on the Workbench, when

PRINTTEXT VERSION 1.5

PrintText is a text viewing program you can use to easily read program documentation, program listings, and any kind of ASCII text files.

SUMMARY OF MENU OPTIONS

ABOUT	Displays program help page	GO TO TOP	Displays the first page
LOAD	Load a text file	GO TO BOTTOM	Displays the last page
SEARCH	Search the file for a string	PAGE UP	Display next page
READ ALL	Read the entire text file	PAGE DOWN	Display previous page
LOAD PP	Load any PP picture	LINE UP	Scroll one line up
PRINT	Print text file from Disk	LINE DOWN	Scroll one line down

Double click mouse button for Search. Click on SMART/SMARTI gadgets to toggle search mode.

Click on the LPH gadget to start/stop speech synthesizer

After PP picture is loaded, click mouse button to exit.

FastForward routine by Dennis M. Greenwald. File requester by G. Heath

PrintText is Shareware, so you can copy it for your friends, but if you find it useful, please send a donation to your local Help the Homeless fund or any similar organization. PLEASE be honest and do so.

Any comments, bug reports, or ideas are welcome.

My Address is: Oyster G. Kaitera
30 Duffin St.
Ailsa Menzies, 16891 16892.

PrintText first loads it will bring up a file requester asking you for the file to be viewed. If you select the file you require and then click

on LOAD, your mysterious text file will be displayed in all its glory. Because of disk space constraints, the instruction file is printed above.

HAVING TROUBLE WITH THE DISK?

We have done our best to ensure that the programs supplied on this month's disk are simple to use, install free and have no hidden charges. However, we cannot ensure 100% success in using the software, and we do not accept liability for any consequences of the using the programs.

If your ST Amiga format disk is faulty - and out of town of thousands duplicated copies are unfortunately found to be - you should send it back for a free replacement to:
ST AMIGA FORMAT APPLS, DATA, DISCOPY LABEL, 20 DEPTH CLOSE, BRACKNELL, 1000 FRODOUR 1, 1000 1000 1000.

This replacement offer is open until the end of April 1989.



HOW TO USE THIS DISK

The ST Amiga Format cover disk is a special format disk which both the ST and the Amiga can read. Even if you are a non-Unix computer user, please read these instructions carefully or you could permanently damage your copy of it.

The first thing you must do is make a backup copy of the disk. Because of the special format, the normal disk-to-disk copying methods, as recommended in the Amiga and ST manuals, won't work. Instead you will need to format a blank disk and copy the files individually. Don't panic, this isn't as difficult.

ON THE ST (assuming a single drive machine)

1. Take a blank disk and format it in the usual way.
2. With the blank disk still in the drive, double click on the Φ drive icon to open up the blank contents window.
3. Now drag the icon for drive Φ into the open window of disk Φ . This will copy all the files, one by one off the master disk to your new disk. Make sure that the master ST Amiga Format disk is write-protected (the sliding tab should be back to the 'open' position) and put it in the disk drive when asked for disk Φ .
4. You will now be prompted at various times to insert disk Φ and disk Φ while copying takes place. There will be a lot of twaddling to do on a single drive ST Disk Φ should be the master disk, disk Φ your newly formatted copy.

If you want to cut down on disk swaps, you can use the Format RAM disk program provided on issue 7's disk as an intermediate step.

Note that our special cover disk contains about 20K more files than will fit on a standard single-sided ST disk. If you own an old 520, you'll have to be selective and copy only the files you want.

ON THE AMIGA (assuming a single drive AM50)

1. Start your Amiga up with your normal Workbench boot disk.
2. Take a blank disk and initialize it in the usual way.
3. Make sure that the master ST Amiga Format disk is write-protected and put it in the disk drive. Double-click on the disk icon that appears. Drag any icons you see in the contents window onto the RAM disk icon.
4. When the disk activity light has gone out, put your newly formatted copy disk in the drive instead. Double-click on the RAM disk icon to open its window, and drag program icons from that onto the new disk icon. This copies the files one by one.

The programs may not all fit in the RAM drive at once on an AM50 - do whatever will fit, then after step 3 delete files from the RAM disk by clicking once on each one, holding the right mouse button down, selecting 'delete' from the Workbench menu. Repeat steps 2 and 3 for the rest of the icons.

USING THE PROGRAMS ON THE ST

When you turn the ST on and put your disk in the drive, you will see a window opened with the contents of the disk displayed.

Each program will have a number of files on the disk. A program called DOLGAL, for instance, will either have an icon named DOLGAL.PRG or there will be a folder called DOLGAL. If there is a folder, double-click the left mouse button on it to open it up, and you should see DOLGAL.PRG inside it. And double-click on a program's PRG file to run it.

Each program should have a corresponding .DOC file - double click on this and then choose

'Open' from the list that appears to read the detailed info from the author. Always read the documentation before running the program.

Programs dependent on disk accessories don't have .PRG icons to be clicked on - in the case of special running instructions are given with the program's documentation.

ON THE AMIGA

The main program will automatically run when you turn on your Amiga and insert the cover disk. To get at the rest of the icons, you will need to run up Workbench first of all from your normal startup disk. Once at the Workbench, put the ST Amiga Format disk in the drive and double-click on its icon to open it.

Most programs on this month's cover disk have icons assigned to them. To run any of the programs, just double-click on the program icon and after a few seconds disk access, the program should load on. In the case of Devpac, when you try to load either GenAM or DevOT, the Amiga will prompt you to insert your Workbench disk a couple of times; follow the screen's responses and the Devpac programs should load fine. For further instructions on using the Workbench, refer to the introduction to the Amiga manual that came with your machine.

When you click on a documentation file, a new window is opened and the text is displayed as scrollable at a time. Press any key to move from one scrollable to the next, or click on the close gadget in the top left-hand corner of the window to cancel the display.

Jason Ashen

WE WANT TO GIVE YOU MONEY!

Name _____

Address _____

Phone _____

(Daytime)

(Evenings)

My program name is _____

For ST Amiga

Approximate total size of files is K

(we cannot use programs longer than 200K; shorter submissions, under 100K, stand the best chance of publication)

File is

Game Technical tool

Business utility Art program

Main program Educational

Novelty Other

BRIEF DESCRIPTION

Checklist (please tick)

- Stamp addressed envelope for return
- README.DOC explanation file on disk
- Printed or README.DOC file (if possible)
- Name, address, machine type written on label
- Disk certified virus free

IMPORTANT - Please sign this declaration:

This program is submitted for publication by ST Amiga Format magazine. It is my own work and has not been submitted for publication elsewhere. I claim my national fame and glory.

Signed _____

Date _____

If you've got any questions for either ST or Amiga which you think other readers would find enlightening or amusing, send them to us!

Make sure your programs are formatted correctly.

Provide a file called README.DOC on the disk which explains exactly how to use your program.

If it is for Amiga, type A, and send it without delay to Vector Data Software.

If it is for ST, send it to Phoenix Group.

Please return the disk when you are done.

If you don't want to damage the mag,

you could use a cheque for the best programs each month.

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Please make all cheques or Postal Orders payable to CDS Software Ltd., and allow 14 days for delivery.
Please state which language manual you require - English, German or French.

The Amiga will be available early April 1989 same price as the ST.





MUSIC

DUNN TO BUSINESS

If you've played any Ocean game - on any format - released in the last 18 months then it's probable that the game's music and sound effects were created by Jonathan Dunn. RICHARD MONTEIRO interviews the man making sound waves for the Manchester-based software giants.

Two minutes walk from Central Station, Owen's home ground, and you hit the plush Midland Hotel; a minute later and you're inside the OMD exhibition centre - venue for many computer shows. Manchester is an ideal spot for one of the largest and most prolific software houses, but the country's many other software programming teams will disagree with that.

It is claimed that 300 bodies lie close toO close to the lefty Ocean tower; working late while listening to Days is definitely not recommended.

Inside the programmer's den, affectionately (it called the dungeons, there are loads of computers and poetry rooms. There's the arcade alley, the 48000 section and the music room among others.

It's the music room that we're most interested in as that is computer musician Jonathan Dunn's pad. On many games you'll find his in the credits as The Game has appeared to fear Dunn - programmers have a strange sense of humour. Jonathan, 26, has been with Ocean for the past 18 months. In that time he has written music and sound effects for an incredible number of games. Here's the man and his story.

What did you do before working at Ocean?

Originally I worked at home playing with my band; it was, and still is, an obsessive hobby. At the time I had a Commodore 64 and became interested in its sound potential. I managed to get some freelance work writing computer music. There was promise of lots more, in fact, the only game I wrote music for before setting up Ocean was Supermania for Ricard Johnson's budget label.

I've been writing music for four or five years - not always professionally. My music studies are self taught, although I did a Performance Music and Technology course at college. That basically covered music recording and recording studios. Originally that's what I wanted to do.

You have written music for an impressive number of games and also for a stereo tape with the recently-released Daley Thompson's Olympic Challenge - can you estimate how many tunes you have written?

Ermm... I have done just about everything since the C64 version of Melody II. There was Arabian 2 across all formats (that's Spectrum, C64, ST and Amiga), P.I.P.P.O.



Jonathan Dunn, Ocean's man of music

ICM4, Mediator, Quantum (which won't be released here), Typhoon, Operation Wolf and Robocop (like version). I expect I shall be writing music for the 16-bit versions of Robocop soon enough. Daley Thompson and Dragon Ninja are the most recent games I have written music for. All the late 1980s era.

TOILET HUMOUR

Getting to a toilet from the development dungeons is not funny. It's necessary to get through a locked door and through narrow doors before getting to the appropriate destination. Why the locked door? Well, the facilities and the rooms are owned by the local Church.

Programmers have often walked through good facilities, but in - Ed. Absolutely Anonymous meetings.



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■ *John has had several customers start to use it at different times. It depends on the circumstances, the fee has been known to vary John's first job was John Ford, the most prestigious title, though it John threatened when appears in the credits of most of the games he writes. John is Dunn's vice president under Art's also the guy Dunn means a lot. His part-time job is Jonathan playing his compositions too loudly, writing most demos for Jonathan's music, and the AmigaOS operating system.*

cross all formats.

The audio tape, the Challenge, had accompanied the record Dunny-Brown game was great fun to do. I wasn't restricted to three or four voices. I had a drum machine and a mixing desk. It was great.

Do you have to stick to files or Amiga machine sound tracks when you write the music for AmigaOS?

No and no. If I'm doing an arcade conversion then usually I base the format on the arcade version. Of course, I don't have to stick to the arcade

theme, but generally they are excellent and worth using. Sometimes an arcade game manufacturer will insist that the computer version sticks very closely to the arcade game - that also goes for the music.

For the first time ever I have been told the music score by the arcade producer. It's for Chase HQ which I had to convert shortly. All the arcade stuff uses multiple voices and it can be really frustrating cramming a gorgeous stereo composition into three channels. Of course I prefer doing my own stuff if I've got the choice and the time.

Games are so varied and the action ranges from non-existent to overkill, there must be times when you create a tune and find it doesn't fit with the gameplay?

Not really. It's not just a matter of it not fitting. Everyone has a personal view on the matter. Some people like Spies, others Jetz, and others Rock music. It's all down to personal taste. I could write something that I think really goes with a game, someone else might think it's crap. What's right?

Last the other day I was working on music for Run the Gauntlet. There were a few programmers outside the room when I played the track. "Steady beat, that's bloody awful" was the only comment I got. They literally ripped my music to pieces. I'm now working on another version.

What restrictions do programmers put on you memory-wise?

On the Spectrum we got between 1.5 and 4K for music. I'm allowed a similar amount of memory on the C64 - 8K at most. As for the ST, well... with Rankin if I had 17K to play with, but I couldn't use all that because the game was programmed in such a way that samples couldn't be used. I was restricted to the usual 8K

the same of the chip inside the ST itself - and there's no way I have time to write 1.5K of music - that equates to over 30 minutes' worth of tune. When I write Amiga Rankin if I have more memory - probably 80K, with 16-bit stuff in general I have around 40k to use, but that's because samples take up so much memory.

What do you dislike about computer music? What sort of sound capabilities would you like to see in music?

It's nice to get away from the restriction of computer music when I go home. I can play on my synthesizer without worrying whether the resulting tone will fit into memory or whether I'm using more than three voices (that is for Amiga's sound).

I get bored really quickly writing solo voices into the computer so I try and spend most of my time playing around on the synth. Sometimes another frustration. I've given roughly two weeks to complete each tune. Naturally I'd like a lot longer. Occasionally a tune leaves my hands without being perfect. I don't like that.

TOO LOUD

At Ocean there's only a thin wall separating the arcade area from the music room. It's a constant reminder to me when I relax and listen to the music. The arcade play houses of the latest arcade machines that the programmers have to converse to it or (at least) while the music, means Jonathan Dunn's part. The only people that suffer in this great struggle are the programmers.

DIRTY DEEDS DUNN DIRT CHEAP

"The first stage in writing computer music is composing an original tune, although that's not always required (some games must have the same music as the arcade machine). It's the favourite part of the job, being creative. Generally I'll draw up the synthesizer and use keys until I find a riff or a chord sequence that I like. I write the basic line first and code that into the computer. I get the basic line playing on the computer in a continuous loop and then play it melody over it using the keyboard. When I've got the melody I can get the computer to play that as well. In this way I can build up a tune in sections.



"As one point I programmed the sound chip itself, particularly on the C64, but now I don't worry about that. It's usually because I've got some interesting set tunes. The things sound chip takes pretty impressive. We looked through the technical data and have already come up with some theories on how to make it do things. The ST's sound chip is limited. It's the same as the Spectrum's except that there is more processing power for running samples. At the moment I've got to explain to the programmers what I want the sound chips to do. That can be tricky! They write the drivers. I just provide the music data.

"Getting music from the synth to the computer is no problem. I know what the note values are simply by playing them. I play a few notes and write these values into the synthesizer. However, there are 276 for development so all the note values are placed into a program on the ST which can be read by any group of programmers. This is particularly useful when a game is coming out on all formats. I give the same music source (note data) to our programming staff in any programming team. Getting note values from the synth to the computer isn't ideal; it would be nice if I could store the complete composition on the synth and then download it to the computer. Unfortunately that would mean encroaching on the programmer's time. It might happen eventually if I push enough."

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If you think three or four music channels are a restriction then try writing better music. The 486 Spectrum is a real buzz box. I hate writing buzz music. The same goes for the PC. Another damn buzzer.

What's needed inside a computer is the sound capabilities of something like the Ensoniq EPS with eight tracks, individual stereo positions, loads of envelopes and sample filtering. Most of the arcade machines are almost up to that standard. The Chase HQ arcade machine, for instance, has six stereo channels. It won't be long before some micos have starting sound capabilities, the Nova-Console looks interesting.

Do you have any favourite computer composers or computer compositions?

I rate Tim Foley at Software Creations. He wrote the music for *Dionic Commandos* and *LED Storm*... he seems a very proficient musician. Bob Hubbard was an excellent musician, but now that he has gone to the



■ As well as writing the music for *Dancing Thompson's Olympic Challenge*,

Jonathan wrote the music for the accompanying free audio cassette. The track was called *Challenge* which Jonathan put together using a D-50 synth, drum-machine and a mix-tap deck.



■ Just some of the games Jonathan has written music for during his 18 months with Ocean. Many of the titles shown here were written across all formats, the music had to be adapted for each machine by Jonathan.

States let's just a legend. There was a time when music was the most important part of game, life, it used games. It was all Bob's doing. His incredible knowledge of the C64 sound chip and wonderfully original tunes changed people's ideas about computer music. The days of the five, four and square were gone.

Bob's music certainly sold games. Nowadays if a game has impressive graphics, good music and attractive packaging the game will sell. It seems to me that people aren't too worried about gameplay. If it looks good and sounds good they'll buy it. All computer games want are flashy sounds to show off to their friends.

The Chase HQ arcade game has good music. I'm looking forward to converting it to home-music format. The high score section has a sort of rap. It has voice saying, "Enter your name (your name)". It's going to

be tricky doing the conversion - impossible on the Spectrum - but I'm going to try anyway.

Are you left to do the sound effects and if so what is the procedure?

Sound effects? Yes, unfortunately. There's no set method for creating them. An explosion is an explosion, white noise with random frequencies thrown in. I load effects as though they were very small bits of music. I've got a frequency envelope generator to help me. I think about a sound in terms of its attack, decay and so on. After that it's just a matter of converting that to a sound envelope. Easy. It takes me half a day or so to create all the effects for a game. On average there are 12 different sounds in a game.

Occasionally I use two channels for the tone and a third for effects. I could use all three channels for tone or all three solely for effects - I depends on the game. I prefer games that have three channels for more music throughout.

Do you own a computer or play games?

No, I don't have a computer. Ah that's not true, I've got a C64 somewhere... it's collecting dust. I don't really have any desire or need for a computer. After looking at a screen of day it's nice to do something different in the evenings. That said, I have recently got my hands on Starbuck's Pro 3D and that really is impressive. It's incredibly complex and has so many features that I would never use. I might get an 88 to explore the software to its full.

I live in Preston so I often go to Deccolod to play in the arcade. Powerent and MType are two favourites. Games for the ST and Amiga get better and better. They are almost up to arcade quality. Even so, I tend not to play computer games; there is a certain magic about arcades.

LINEAR DIGITAL SYNTHESIS

Occasionally Jonathan built some a Roland D-50 synthesizer to create tunes for computer games. The D-50 employs a special technique, Linear Sincosine (LS) technology for producing sounds. Roland's proprietary circuitry for digital synthesis takes a linear approach - as opposed to conventional, non-linear, digital synthesizers which copy into waves using the grand-sounding non-linear exponential synthesis. (As you would expect, it is claimed, is more realistic sound.)

The D-50's specifications, if you must know (it's an over-engineered) you're doing to tell us - list, fol-



■ The Roland D-50 synthesizer. Extra memory is available in the form of this compact, replaceable cards. Each card can store 64 sounds.

low, 80-key velocity sensitive and pressure sensitive keyboard that can be split; 16 built digital effects including equalizer, chorus and reverb; internal memory capable of storing 64 patches (nameless); bands/modulation, joystick, volume, and aftertouch



controls; 80-character USB. It's a real bit a machine, but for around £1000 you'd expect that.

According to Jonathan the only problem with the D-50 is that it is not multitrack. This means only one sound, two at most by splitting the keyboard, can be assigned to the keys. For this reason Ocean are selling the machine in favour of the Burg M1.

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Does the thought of money management frighten you? **JASON HOLBORN, who has no money and no sense, looks at a package that aims to take the pain out of looking after your overdraft.**

PERSONAL FINANCE MANAGER

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Money management can be a complicated, and very often a frightening, experience for those not blessed with the skills of an accountant. It is therefore great to find a package that pretends to be easy enough for anyone to use while managing to be "the favorite most sophisticated Personal Finance program" with claims like that you'll be right to expect something special, but does it deliver?

Personal Finance Manager is a fairly sophisticated money management program that will allow you to keep track of all your various bank and building society accounts as well as most vitals such as "plaster". The program comes to you as a single, unprotected disk complete with a comprehensive 50-page manual which helpfully includes a tutorial to get you up and running in no time.

PFM works in a similar way to all the other money management products on the market, so if you're used to using a package such as Digit's Home Accounts, you should feel totally at home.

Using the program at its simplest level makes you entering the transaction data, the amount, a short description of the transaction and whether the account is to be debited or credited.

In addition to being able to keep an eye on the usual debits and credits, you can also tell the program about any standing orders or that

regular payments are never forgotten and are automatically carried out. You can also define up to ten different budget categories which is useful for determining where your money is actually being spent.

Other features include reconciliation, which is a very clever system that attempts to balance the books if your bank statement doesn't quite tally with what the program has calculated. PFM will attempt to balance the statement by highlighting any cheques and deposits that may not have made it through the system. You can also manually enter any cheques and deposits by merely typing the particular transaction in or out.

Let's get graphical
PFM includes three different types of graphical reports. The first, the balance plot, allows you to see at a glance how an account balance differs over a particular length of time. When your balance drops below zero, all years after that date are highlighted in red until you move back into the black.

Another useful graphing function is the budget comparison bar chart which shows the value of each budget category compared to the actual expenditure of each. It is simple enough to switch the graphics functions on or off.

The final graph is the familiar bar chart. PFM's bar chart shows the distribution of entries for the different budget categories over a specified period. All the graphs are clearly designed and, most importantly of real use. The one bad point is that no print option is included, so you're unable to produce hard copies for future reference. This could of course carry out the usual FACS HELP combination, but the final printout can end up looking decidedly tacky. You

can, however, print out your transactions for a given time in the more conventional formatted bank statement format.

Financially viable?

Personal Finance Manager is a simple program, however it still manages to offer some powerful functions such as reconciliation. Compared to other programs of the type, including Digit's Home Accounts, PFM can hardly justify the rather substantial claim of being the most powerful personal finance program available on any computer. The lack of any method of printing your graphs is definitely a serious omission that will hopefully be fixed in a future release.

To conclude then, if you're in the market for a money management program that is easy to use - and you're not really worried about the lack of the more powerful accounting features such as double-entry accounting offered in other packages - then Personal Finance Manager is certainly worth considering. ■



DOUBLE VISION

Unfortunately PFM doesn't support double bookkeeping. This, for the uninitiated, is simply a matter of balancing a credit to one account with a debit to another.

■ Using this to budget yourself and then see on screen how much you have over spent can be impressive!

■ PFM's screen display offers multiple views - view in the spanned of the same time. When you stretch or expand a window any graphs are automatically re-sized.

for

- Easy to use
- Number of entries limited only by memory
- Powerful graphing functions

against

- Can handle only one addendum at any one time
- Lacks any way of printing graphs

Features

1 2 3 4 5

performance

1 2 3 4 5

range of use

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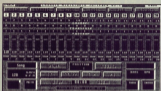
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REVIEW

IS THE ADVENTURE OVER?

Are adventurers dying out? Is the valiant warrior fighting a losing battle against the arcade conversion mongers?

GARY BARRETT picks up his sword and wonders whether 16-bit games are paying too much attention to graphics at the expense of the more traditional, thought-provoking adventure gameplay.

Adventure games have been around since a way before home computers. The first one, *Cornell Cases*, was written in the language FORTRAN on a mainframe computer by a duo called Crowder and Woods. It was basically a coin-in or garden variety text-only adventure, but at the time it seemed new to be true that it aroused great interest among those lucky people fortunate enough to

can draw five, and adventures were still only selling in small numbers compared to arcade games. Most adventures were still being written by individuals or small companies where a full time effort was not feasible.

There came a time when people were beginning to take adventures as one shot games — solve them once and you'll never try again. Something had to be done to make it so that it wasn't just a matter of using the appropriate object at the correct time and in the right place. They needed to be of a world where things happened anyway, not just because you were there. The first adventure to try this was *The Hobbit* by *Infobound House*. The Hobbit was a nice try, there were characters that did their own thing, there's *Dalarnstead* sat down and sang about gold, *Geddef* wandered off and I found kept going away lunches. At first they were entertaining, but after a while they just became annoying. A lot had been attempted, but unfortunately it was too much for eight bit machines.

Text or Graphics

The world was still divided into two schools: text-only and graphical adventures. Text-only adventures were getting more and more detailed in their textual descriptions, in effect you were getting a novel with problems

rather than just a series of problems. *Alucan* still held the title of best text-only adventure. Graphical adventures were getting much better artwork, but the text was still short and lacking detail. A compromise was needed and *Magnum Scrolls* made that compromise with *The Pawn*. *The Pawn* had both long and detailed text and excellent pictures. *Magnum Scrolls* followed up *The Pawn* with *Gold Of Thieves* which boosted players' opinions further. *Adventures* had come of age.

Hold on, Hold off

Here begins another controversy — Role Playing Games, or RPGs to their fans. Those who play the classic *Dungeons and Dragons* around the table are living a more exciting, not necessarily the rubber sword brigade — all but you they are playing an RPG. Adventures, they would maintain, are a quite different thing. RPG people used to look down on computer adventures as a pale imitation of the real McCoy.

As computer adventures became more sophisticated, being in the background at the time were attempts to draw role players into the



When home computers did come as to the scene, the conversion of *Cornell Cases* was feasible and as to a fair time was written after version 4. Eventually people started to explore other avenues: fantastic, horror, science, professions and business settings.

As time went by computers began to have more memory and their graphic capabilities improved. But the result was graphical adventures. The first few had only a handful of all screen graphics and they were generally poor quality. Just because you can write doesn't mean that you



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DEVIL WORSHIPPERS?

Occasionally newspapers run stories on devil worship, and if they do come up with a bit between someone involved and things they've said it is in the old-fashioned, plain-spoken way that you see in Christy, even Dennis and Sheri, but that doesn't mean the editors themselves do. Let's face it, Christy and Sheri don't have a flawless track record - The Spanish Inquisition for one - and starting people thought to be a witch in their own country a few times. If they did they got a Christian burial and if they had they got burnt at the stake. Sounds like a real deal if you ask me.

boy of the adventure world. Most games, it must be said, fall short of that goal. Computer role playing games are generally "fill the numbers and take the measure." Role playing does often involve killing, but that's not the only part, and software houses failed to grasp this. The result was that most computer "role playing games" were in fact just hack and slash and failed to attract the role players. The Bard's Tale and the Ultima series of games are the best of the pseudo-RPGs, but the US Advanced Dungeons & Dragons (AD&D) game Pool of Radiance is eagerly awaited by many, due from US Gold in early summer. It could be what role players have been waiting for.

Yea, but what are RPGs?

During the early '70s something was very popular among. One regular player among them was a certain Gary Gygax. He decided to write his own game he was talking about a set of rules for a boardgame, not a computer version yet and that game was the now famous Dungeons and Dragons D&D. It began life not as a computer in the traditional sense with huge armies sold into early bottling it out over miles of lines, but was on a much smaller scale, using just individuals rather than armies.

These individuals had to be



something special though not just your usual bunch of tired soldiers but heroes from fantasy novels and films, potential dragon slayers, mighty wizards, great mages of death and warrior priests dedicated to carrying out the deity's work. His idea was to be a timeless present when there are ravens moaning out there to defeat and slaying processes to rescue from them?

A lot of numbers

In a conventional D&D game, heroes or player characters as they're called, come into life in a simple way but come alive using. Dice are used to generate the statistics for the character: strength, intelligence, wisdom, dexterity, constitution and charisma. The statistics affect how capable the character was of doing certain things: levels of strength, casting magic spells, casting healing spells, magic user talents, resistance to disease and harm and how other people see them and reacted towards them. A high value for a statistic meant the character is very good, and low meant poor.

A profession was then chosen for the character: fighter, magic user, cleric or thief. Then was the time to set off into the world and earn fame and fortune, or perhaps die it.

While the players are busy generating their character another individual set off in some distant remote looking of things for the players to do. That person is the "Dungeon Master" DM. The DM has the awesome responsibility of controlling the rest of the world that the player character PC(s) live in, he has to be very often creative that they came across, and needs to know something to be able to make something up quickly almost every place they go to. It sounds a daunting task, but it's about very creative one and after a few games the DM is into the swing of it and things begin to run more smoothly.

Dungeons and Dragons, built as a rule following amongst students and eventually it crossed the Atlantic to Britain. Over here it became just a popular. After a few years there was a new version of the game, with the stunning name of Advanced Dungeons and Dragons. The new game was very different from the old

PROBLEM SOLVING IN RPGS

In general, role playing problems can be solved in more ways than one: consider a thief doing a spot of burglary.

A thief breaks into a house and comes across a chest. The thief examines the chest looking for traps, and the DM rolls some dice and compares them with the thief's "find traps" skill. There appear to be no traps on the chest and so it's time to reach for the lock picks to try and unlock the chest. More dice are rolled, this time comparing with the thief's "open locks" skill. Unfortunately, your finding traps skill wasn't up to scratch, there was a trap on the chest, and a second picks the thief's finger. Now the health statistics come into play to see whether you survive or not.

If the roll of the dice hadn't been kind to you and you hadn't been allowed to open the chest, you would have had to find another solution. Either persuade another character to open it for you, or alternatively try brute force and ignorance to smash the chest open. Your thief breaking anything fragile and also making lots of noise, possibly resulting in being caught.

The possibilities are endless and there are always players who think of something that hasn't been accounted for, which is fun for both player and DM alike. There are times in computer adventures when you come up with what you think is a soundly cunning plan, only to receive the message "You can't do that," which is not only irritating but also obscures the illusion of being in another world.

ADVENTURE OR ROLE PLAY?

A question that is often asked is what the difference is between role playing games and adventure games. The answer can be found in the names.

Whilst adventures have preset stories, and most problems can only be solved in a certain way. The characters that you control and guide through the adventures are created by the game's designer and have most of their reactions are programmed. If you meet a monster that it's often a case of run or die because you haven't the right weapon, or you die if you're out of.

In role playing games, the character that you

use is one of your own creation. In many games players get introduced and go off on a quest, the reward being that equipment can change as time goes by. Making a monster to run towards by simply hitting it often you'll get a reward, it fights back and the combat ends either way.

Another difference is that adventures are puzzles that have to be completed, and when you do so you won't play it again. Role playing games never have almost, characters often live or die and if they live they carry on their existence having gained new knowledge and skills from their experiences.



ILLUSTRATION BY JAMES HAMILTON

It was still fantasy, but many rules had been added, cleaned and changed and the game itself was no longer a loose set, but two hardback books, one for the players and another for the Dungeon Master.

Games

Without Frontiers: Now you can get games for a multitude of different settings, no longer is D&D just fantasy. Science fiction (Star Trek, space opera) (Star Wars, Star Trek), sci-fi of Ethulhu, city (Thruage Master Ring Turtles), post-apocalyptic (Gamma World), oriental (Mushu), medieval (Chivalry and Sorcery), 20th century (Kampfgeist) and of course fantasy (Dungeons& Dragons) is supported now.

Thought provoking

Adventures and role playing games are both hard work for the programmer and design team in the development side. Adventures have success of text, and all of the problems have to be worked out with every possible player action anticipated if it's going to be well received. Role playing

games however need very extensive play testing to make sure that they're not too easy or difficult. Role playing games, on the other hand are often easier to test and problems are often much simpler to detect and debug because the game states, the step shifts off the screen, the being gets confused or a variety of other similar problems are clearly visible on the screen. In an adventure, a bug might become apparent until many hours after it happened.

The result of the extended development time for adventures and role playing games is that they don't come out very often. When they do when aren't as high as the comic version of "It's all at the alien again, but with different graphics, and some new items" because there's not as much hype. Small software houses can feel they've spent so much money developing a game that they simply can't afford to publish it if it doesn't take much thought for software companies to make that they'd make much more money bring out four arcade games instead of one role playing game or adventure.

Having said that, adventures do tend to have a longer shelf-life than arcade games, so the money falls in over a longer period.

What's to become of us?

Now that we've established what adventures and role playing games are it's time to discuss their fate. Adventures have always been a niche market compared with arcade games, but now more and more people are just going into shops and picking up the latest arcade conversion, simply because it's been so long and it so well known that they had the software houses. In many cases they get home and find out that it's a load of garbage and they could have spent the money on something more satisfying.

Even if it is a good conversion you often get bored of it before you complete it, there are only so many items that you can steal, or little get too many you can't fit back before you think, "Why bother?" This is a place where adventures and role playing games can come in. No-one's saying you won't get bored or complete the game in the end, but the amount of time spent in finding it is greater.

If the trends continue and all people do is buy arcade games then the future looks bleak for adventures and role players. Games would start to fail, the credits would dwindle and few games would be released. The end result could be that adventures might cease to exist and the computer users that have been deprived of their adventures will seek their entertainment elsewhere.

Computer software won't ever take off true role playing because they don't compete directly. Let's hope the adventures and RPG sticks around, because if it doesn't there may be a lot more "dead endzones" wandering the streets, entering those old stores marauding at amusement centers and sacrificing the occupants with sharpened cyrilsks. ■



FACT OR FICTION?

If you're wondering about the difference between science fiction and space opera this is the simplest way to explain it by comparing two films, 2001 and Star Wars. The former generally stays the laws of physics and is an extension of 20th century technology whereas the latter takes the laws of physics and throws them out of the window using impossible to work gadgetry for the majority level.

WHAT ARE YOU BABELING ABOUT?

The third issue's Guide to the Galaxy by Williams has some of the most detailed problems of any adventure. It manages to retain the humor of Douglas Adams' books and still keep you amused and frustrated. One of the trickiest problems is when you're in the flying ship and need to get the Babel Fish into your tin.

You need a dressing gown, a watch, a towel and junk mail (but do you mean you left the mail on Earth? Oh, dear). Now, when you press the Babel Fish (Williams' solution) behind the flat glass door a drain. Wash the drain with your towel and the next tin condenses down (roomer hole). Toss your dressing gown on a hook you get that hole and the third tin gets water by a draining sink. Wash the robot in with the watch and the tin fills. The watch, this is the oil and is eaten by an upper-half-of-the-room cleaning crew.

What you have to do is put the junk mail on the watch so that when the tin fills the letters fly up in the air too, and the robot gets confused and catches the wrong thing. The fish then lands in your ear. Simple, really.

Problems like this occur in most adventures and it's just a matter of looking at Babel to solve the problems and having the right objects to do it with.



■ The Arcade - death land for adventures?

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CYBER SCULPT

What do you do when you want to fill your screen with a tube of toothpaste? You could draw it using an art package but you never get to see the other side. CAD-3D packages have long supported such outrageous ideas, but creating images hasn't ever been easy. MARK HIGHAM looks at Antic's new modeller from all points of view.

£79.95 ■ ST only, colour screens, needs ILM, Cyber Studio also required ■ Electric Distribution, Meadow Lane, St. Ives, Huntingdon, Cambs PE17 4LG (0480 496789)

Computer aided design (CAD) programs have long claimed to provide the ultimate environment in the manipulation of 3D images. They let you view pictures from as many angles as you want, stretch them, size specific areas and even colour the faces. However, when CAD packages really fall down is in their creation of the original image. They certainly do a brilliant job of manipulating it once it's there, but bringing pictures that are as tortoisian-spiral as

When Electric released their popular 3D package - Cyber Studio - in the middle of last year, it managed some brilliant tricks with 3D images. Cyber Studio even produces stereo pictures which look great through a pair of red/green 3D glasses.

Today's march on the picture window frontier is that your basic image may be created from within Studio, saved to disk and then reloaded into Studio where the superior 3D handling features take over. The advantage of this type of approach is enormous. Not only do you make use of the excellent 3D manipulation facilities of Studio, but the great effects it has are compensated for by Sculpt.

Sculpting the way forward
Sculpt works by giving you colours in bringing a simple template and then building on this in the 3D editor. Each

template is given a name so that it can be pulled into the final image and manipulated, thereby giving you the greatest possible control. It's all very well creating a complicated template with more lines drilled through it than Bonnie and Clyde, but when you start doing anything decent with it every thing can soon become remarkably complicated. Consequently many separate templates are beneficial.

You have access to a simple poly grid drawing routine which creates polygons from 3 to 32 sides. These edges can then be rounded, if desired, and the template saved onto disk for later use. Once you've got the basic template, it's held in memory so that whatever changes you might make to it as a 3D picture, the basic template can be re-created at any point. Several different shapes and sizes of polygons are possible by making use of a single template.

A primitive choice?

Antic's menu option allows you to enter the 3D editor by first creating simple cubes, discs, prisms or spheres. A shortcut to dragging your template is to select one of these objects and let it create its own template. This can then be changed further by editing the template.

Once you've got your image this far it's a simple process to spin it, extrude (pull out across a defined length) and push or pull objects into various different shapes. Using a path-editor you're able to define a line to whatever dimensions you wish and then use this in the creation of an object. For coils, for example, take a circle and use your defined path so that the circle can be twisted along this path into whatever pattern you choose. It's a complicated process

because when the number of rotations and the basic path structure have been properly defined, you can end up with something grossly unrecognisable. There are compensating methods which rotate around a central axis or into themselves - not a lot of use since the whole thing becomes so complicated it's impossible to tell what's happening.

What next?

Okay, so you've got a set of templates (pushed and pulled into something resembling the image that you want to cut, now what happens to them? The next stage is to go into the 3D editor where you can take the first tentative look at your image as a three-dimensional solid. It can often



TAKING A CLOSER LOOK

Scrub into your own your 3D image from an alternative package/development - this feature will, unfortunately, not be available until the next version. Although happy with what you've got, there are a couple of areas that we think the editor ignores. We'll give your program one last look and see exactly what it means for things that are missing you wish to add to the menu.



■ The main layout screen. You can select specific faces and colour them but they remain black until loaded into Antic's CAD-3D 3.0

■ Pulling a face away from the image and then viewing it as a 3D picture. Antic's power is in the range of features for manipulating 3D images.





FROM SCULPT TO CAD



■ You begin with a simple polygon and manipulate vertices to create your first shape.



■ It's not a simple step to rotate or stretch your image but it can give some odd results.



■ The 3D image is viewed from within Sculpt.



■ Loading it into Cyber CAD then gives good results.

be a daunting process because if you're not careful you've got all manner of lines just where you least expected them. However, if you get this far without considering some method of self-manipulation then you have access to a whole range of features. These may be placed anywhere around the object and then joining each set of three to form additional faces. These may be placed anywhere in the object, initially they won't really exist until you select an option to give an edge to your new face.

Other features provide you with options to select areas of the image that can be bent through a controlling slide curve. You can scale some or all of the picture across a single plane or all three planes. Or, if you're feeling really dangerous, move them

through different axes to produce some very unusual results.

The clay way

Sculpt treats its subject matter as if it were a clay-like solid. This allows you to grab vertices and pull them into new positions, changing the design of your object. Simple commands then allow you to rotate or bend the result. A magnet feature permits you to move over the top and pull the points towards the magnet depending on the power of the magnet.

There's a 3D mirror, which can be positioned anywhere on the screen, that will exactly reproduce the selected items. If you've created a complicated image, or if you wish to extract certain faces from the image, then

you're able to select areas of the image and delete them into individual images. These may then be introduced, along with other templates, and treated as separate entities.

Move the cursor over with Cyber Studio begins its in the coloring of faces. Sculpt allows you to select specific faces and then colour them with variations from a definable palette. However, you cannot use any of these changes until the picture is imported into Studio, where the colour palette is maintained.

The final 3D image (colour palette and all) can be saved onto disc and imported into Cyber Studio. Even the pictures are entirely compatible with Studio, you can also take images from here and import them back into Sculpt for further work.

A new direction

Cyber Sculpt is not intended to be a cheap way of venturing into the CAD environment. For small support Cyber Studio is an absolute pity if designing images can be restricted. However, if you're looking for more professional instruments usually only found in expensive professional packages, then the combination of Sculpt and Studio is sure to satisfy. The method of saving data and then reloading a bulk into a secure package for further manipulation is never an ideal way to go about your packages. Admittedly you can take advantage of the best of both worlds, but in the end you can feel you aren't properly exploit either.

What Sculpt offers, it does well. It performs brilliantly as a tool to edit stretch and manipulate polygons and is exceptionally fast with the most complicated designs. The manual offers extensive tutorial stream aimed at the absolute beginner as well as a reference guide for those conversant with the environment. Overall it's an amazing option for anyone CAD users. ■

Features

1 2 3 4 5 6 7 8 9 10

ease of use

1 2 3 4 5 6 7 8 9 10

graphics

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

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1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

For

- Options to twist objects into any conceivable shape
- 3D Primitives are standard
- Fast and fully compatible with Cyber Studio

against

- Cannot colour objects
- Can take some time to learn what to do and how to do it
- Need Cyber Studio for any serious work

GOING BACK TO THE STUDIO

After Cyber Studio is a professional CAD package needed for producing expert results, it incorporates the separate program for use on IBM PCs or laptops. There are Stereo CAD-3D 2.0 and Cybermate. Stereo CAD-3D is an advanced CAD program including camera views with variable zoom and wide perspective control. This means you can examine your image from any angle. The resulting image can be rotated and up to three light sources used to provide a convincing realism. Background lighting with variable intensity can combine to add the final touches to a colourful design.

Full screen images can be viewed and saved in either Degaus or Macintosh formats. The advantage to this is that you can then use them in your own animation programs or as

part of a game. High resolution prints are also available.

Cybermate is an animation camera language designed primarily for use with Cyber CAD-3D. It takes you from CAD-3D to what it works with standard Turbo commands and sophisticated display control statements to provide you with your own smooth and fast animation sequences.

Cybermate uses sophisticated tracking routines to store up to 1000 key frames (worth of frames on a standard 1000 monitor). These are then played back at speeds of up to 50 frames per second. Sound effects can be added and limited special effects included into the sequence. Once the Cyber menu is able to create stereo images, a pair of 3D spectacles can quickly have you gazing far afield.

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GRAPHICS

MOVIESETTER

If you've ever wanted to produce your own cinematographic masterpiece, but lack the funds to hire a studio, film crew and actors then **MovieSetter** could be the program for you. You create the cast, draw the scenery and then edit to your heart's content with only your Amiga for help. **GARY BARRETT** tries his hand at the directing lark.



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For many people computers are just number crunchers without a soul, but they can do much more than that. Yes, there are many business applications, but they seldom use the graphical potential of the machine. A bar chart is one of the most boring ways possible to display information. How much better it would be to have pie charts and

taking tables. With an animation package this is possible - it takes more effort, but the end result is more informative. If that doesn't appeal to you then you can also create your own cartoon characters and have them run around in word worlds. Draw your boss, crank him with a huge hammer and make him weep.

Getting your act together

MovieSetter comes in two forms: a 512K version and 1-megabyte-plus version. With the former you have a separate 'set editor' and 'movie editor', and in the latter you have both in memory at one time. This is so that you can still have decent length animation sequences on a 512K machine. It's good to see a new graphics package that does run respectably on an A500 - an increasingly rare sight these days.

Before you start on your blockbuster movie it's worth having a look at the demonstration production supplied. It shows some of the more commonly used features: scrolling, sound effects and some of the predefined characters (or 'faces') as they're described in **MovieSetter** stumbling around. There's also a tutorial production of a housing bill that the manual explains how to do in a simple introduction. After messing

around with these two for a while you'll want to create your own sequences of animation and produce your own 'movies'.

To the drawing board

Looking in the pull-down menus you find an option called 'set editor' which is used to create the still images which are to be animated. In effect it's a sprite editor - the still frame chips have to be created separately. There are two sets of tools for related and drawing icons. The drawing icons allow brush selection, brush design, colour selection and window drawing options which include lines, boxes and ellipses.

With the face related toolsets you can animate your face set, add new frames, cut, copy and paste them and generally throw things onto the cutting room floor. Once you've finished your face set you can save it and return to the main production menu. If you return to the production menu then the face set will still be in memory and can be used in production, saving disk access time when you're just breaking things.

Animation!

Now that you've got a face set it's time to put it into action, using the production-editor to specify the move-

WIRE OR PIXEL



■ Wire frame *ParadiseIsle*. By its wire frame show pixel editing from *Fantasticon*.

There are two approaches that are used in computer animation: pixel blocks and wire frames. Packages that use blocks of pixels, sprites effectively (see *Fantasticon*, *Outscape* and *MovieSetter*) with this approach you can have much more detail on the animation, but they do really eat up the memory. Consequently you don't get to see very long sequences of animation.

Wire frame graphics however are stored as a series of points and so they take up much less memory. Another advantage is that you can do weird things with the graphics more easily, change their shape from one frame to another, which then and they also move considerably faster. Unfortunately the animated characters tend to look angular and unrealistic unless you have many points. *Paras in Flight* and *Snail* 20/80 all use this approach.



■ Scene changes shown on the storyboard

STEP BY STEP

- Prepping through the stages of the animation



Choosing a location

Being your masterpiece, doing it on a blank white screen is not what you'd call exciting, so you need some background scenery. There are three choices of scenery on the disk, but they're in standard 800-format so screens from any art package will do. You can't create backgrounds within Movieletter, so you need a separate art package.

Select the background from the event menu and load in one from disk. You're then offered a choice of wipes for the screen, how a new background will appear as it changes. The wipes include a straight screen appearance which is quietest, but there are also some wipes that look better: parting curtains and even a scrolling screen. You have to choose between speed and visual pleasures. The background can scroll up, down, left and right at a wide range of speeds.

Sound effects

Now that your character is stomping around the stage you'll probably want to add some sound effects. These, like pictures, are in standard 800-format and need to be created outside Movieletter. Sounds are added by simply loading one from disk and then slowly stepping through the production frame by frame until you reach a point where you want the sound effect. Click on 'Event' in the sound control window and the sound's added. Sounds are sent through the left, right or both channels. The volume can also be adjusted. The process is repeated until you've added all of the sound effects that you want and then you can play your movie again and listen while you watch. Sound effects are only played when the movie runs forwards.

Back to the storyboard

If you select the 'Storyboard' option from the Production menu then you can use when any major changes took place in the animation. Changes that you look for are: track start, background changes, scrolling, sound, color cycling, palette and timing changes and looping. With the storyboard you can go straight to the frame in which any of the above take place. Useful if you want to know when the scenery changes or sound effects come into play.

ZOOETROPE

Another recent animation package is *Zooetrope* by Audio Software. (This is almost identical to the '87 Cyber Paint 2 released last month.) As far as manipulation of the graphics goes, *Zooetrope* is much better with some very neat effects possible like crystallization, blur and ripple. Unfortunately *Zooetrope* requires at least a megabyte to run and so Movieletter beats it on that count. *Zooetrope* is made of an animation package rather than a movie maker. It does do some impressive things, but at least it produces clips that could go in a story window and attract people's attention. Movieletter can on the other hand produce a full blown movie with sound effects.



- Using the set editor to create your cast

The duration of your movies is dependent of several factors: number of sets, backgrounds and sound effects and of course memory in your Amiga. Sequences of several minutes can quite easily be built up.

End of the show

Movieletter is a simple and easy-to-use animation package with which you can make legible sequences of cartoon-style movies. Things do slow down a little if there are lots of large objects moving around at the same time, but the end results are pleasing. Creating your own background scenery requires an art package which is a pity, but not too to be held against Movieletter.



features

1 2 3 4 5

performance

1 2 3 4 5

ease of use

1 2 3 4 5

memory

1 2 3 4 5

format value

1 2 3 4 5

for

- Simple to use set editor
- Long animated sequences are simple to produce
- Easy to include sound effects
- What you see is what you get

against

- Art package needed to design backgrounds
- Large graphics really eat up the memory

WYSIWYG

One of the best aspects of Movieletter is the way that you can make minor changes and then simply re-run the whole job and see the effect. It makes it very simple to build your movie to perfection. Unfortunately if you have only 512K of memory then you'll have to stop re-running and re-loading your plans, which makes this considerably more tedious.



AMIGA

The programs listed in this month's Amiga PD Update section are part of the Fried Fish collection of disks. All disk numbers quoted refer to the Fish Library. Most will also be available from other libraries.



Star Trek

"Beam me up, Scotty!" These iconic words are still as familiar to the current generation as they were to children twenty years ago back in the swinging 60's, although the Starline Enterprise's five year mission seems to have dragged on a bit too long to be believable, by about 25 years to be exact, audiences around the world are still enjoying the TV series and, more recently, the feature films.

Not surprisingly, Star Trek has spawned many attempts at a computer game but, until now, an Amiga

PD UP

More and more companies are going out of their way to give you free software. Are they mad? Of course not!

The software in question is public domain. **JASON HOLBORN**, Format's resident PD connoisseur, looks at the latest offerings.

Star Trek was nonexistent. If you're a fan of the Star Trek adventures, then you'll be excited to learn that an Amiga Star Trek game is finally avail-

able. The game stands out. One interesting note about the game is that the programmer sent an assembler C listing, an animation scripting



■ Beam the alien Scotty!



■ The bridge of the Starship Enterprise.

AMIGA: BEST OF THE BEST

At about 1000, space is our most money and some programs couldn't make it into PD Update. Below is a list of other PD programs worth performing along with their associated fish disk numbers.

Blown ■ Disk 114 ■ A very handy window transfer that lets you turn your Windows windows into small icons which can be dragged later simply by clicking on the window's icon.
Walter ■ Disk 127 ■ A program to print fancy customized disk labels. It will combine an 89 picture and up to 50 lines of text and then print the result.

ST: BEST OF THE BEST

Here's a list of a couple of programs that caught our eye this month, not because of space constraints, but to reach those users in other fish bins.

Fun-Mover ■ Disk 131 ■ Shows you how to set up to the ability of the night view-finding where the car has gone. Fun-Mover calculates the day and set of both the car and items of the location and in any time.

ROM-com ■ Disk 137 ■ Not surprisingly this is an ST-based draw machine. Works through MIDI and is nice in high-resolution only.

able, and even better, it's PD!

If you've ever played the Fastest Star Trek game on the Apple ST, then you'll feel instantly at home with this Amiga incarnation. The game feels, looks, sounds and even plays almost exactly the same as the ST version. The game allows you to control all the main characters in the Star Trek series such as Kirk, Spock, Bones, Scotty, Uhura, Chekov and Sulu. Each member of the crew is responsible for a particular function of the ship. Uhura handles ship communications, Scotty looks after the engines (he'll never take any more Captain's orders). By moving between the different crew members, you must manage the running of the Starship Enterprise.

The latest Star Trek game runs in HiRes mode (that we modify) and uses graphics digitized from the TV series. The sound too is sampled directly from the series and really

package called The Director was used to write the entire game. The just goes to prove that there's hope for us all!

The bad news is that you'll need at least a megabyte to run the game and a second drive is most definitely recommended. Star Trek is a worthy PD Platinum winner and is not to be missed. The game comes on three disks and sells for only £8.95, which is the cost of the three disk alone. Curiously, the only company we know of that sells Star Trek is George Thomson Services. You can contact GTS on 077662 134.



File requester Disk 35

Many C and Assembler programmers will tell you that one of the most

UPDATE

avoiding omissions in notation - the Amiga BMP system - is the lack of any standard file requester: if you've ever tried writing your own program that required the user entering a filename, you'll probably have resorted to a Phrase Type in filename and press RETURN, while this may work, let's face it, it's not really that nice and can lead to unforeseen problems.

An Requester is, unsurprisingly, a standard file requester in the form of a clickable object mode. This can be included into any programs that can be passed through a standard Amiga linker (such as BLINK). All you have to do to include it in your program is call the function `getfile()=1` and pass it a few parameters. Include the filename of the object file in the list of the disk during compilation the object file is included in your final program.

An Requester is in fact the same as is used by software houses such as Soft and is written by the British Amiga programmer, C. Heath of Microbits Inc. If you program in C or Assembly, this is well worth trying.

ST

All the programs in this month's ST PD update were taken from the ST PD collection of disks and therefore the disk numbers quoted refer to that collection. Most will be available from other services. This month's ST PD roundup has a musical flavour to it.



Music Writer Disk M9

If you can't afford one of those expensive synthesizer things, you can still get decent enough music from the ST's humble Yamaha FM2141F sound chip. Just look at demos such as the 'Big News' with Music Writer, the job of creating beautiful music on your ST becomes much easier.

Music Writer is a score editing package written completely in GEA BASIC that allows you to compose your musical masterpieces by pointing into down on a stove in a similar manner to Activision's excellent Music Works. The package currently only works in high resolution, but if you've got the PD Mouse Emulator

from Nick Reed, this shouldn't present too much of a problem.

Clip Art Disks A77 & A78

Desktop Publishing. That's the latest word in computing. Everyone from your local florist to the big multi-national corporations are using computer-based desktop publishing systems to produce anything from the Parson news to reports on the stock market. But what makes a desktop published page look any better than a typed page? The ability to incorporate pictures and diagrams anywhere on the page is undoubtedly one reason. But if you haven't any talent for drawing, the desktop publishing dream doesn't always seem so sweet.

Clip Art is a collection of various useful images that can be cut out and used within your own page layouts. For example, if you were producing a poster for a party you could use images of a few bottles of bubbly and perhaps even a few balloons and streamers. These could be tastefully pasted around the borders of your poster.

This PD collection of clip art is in high resolution (640x480) and can easily be converted to other low or medium resolution using a program such as Pix Switch. The two disks contain a whole host of different images ranging from pictures of Arabian Nights to pots of flowers. There's also a whole range of different fonts that could easily be converted into GEM-compatible fonts. Really useful clip art is hard to come by these days, so it's a real treat to find a collection that is both useful and, most importantly, free. If you're into desktop publishing or you use graphics images in your word processing, then these disks are well worth buying.



DX Voice Master Disk 122

Do you use a Yamaha DX 100 or DX 27 within your Atari MSX setup? As well as the usual MSX programming, did you know that you could also use your Atari to edit the actual sounds the synthesizer produces? 'Patch' software - as they are called - are usually

expensive, but if you look within the PD libraries chances are you'll find a patch editor for your synthesizer.

As anyone who owns a Yamaha patch will tell you, FM synthesis is not exactly the forefront of sound synthesis systems. Using a computer-based patch editor can make the task of designing new sounds so much easier. This particular PD patch editor is for the Yamaha DX 100 and DX 27 synth. It allows you to change all the different parameters and settings of the FM sound operators and then save the results down to your synth.

Sound Com Disk M9

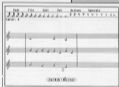
Sound Com is a very powerful program that will be of particular interest to any GEA BASIC programmers. The program, as you may have guessed, allows you to design sounds for use within your own GEA programs. Although it is fairly technical and the instructions are written completely in German, learning such sound chips, it shouldn't take you long to start churning out some impressive sounds. The program only works in high resolution, but, once again, this program is a very good reason why you should get your hands on a copy of Nick Reed's Mouse Emulator.

THE SUPPLIERS

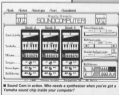
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SCREEN PLAY

It's just one exclusive after another! **MARK HIGHAM** and **GARY BARRETT** have spent last month pestering software houses for all the hitherto top secret new releases. This month we give you the first 16-bit review of the 16-bit *Ultima V*, and the divinely inspired *Populous* - certain to earn you a place in heaven... or hell.

PREVIEWS



▲ *Ballistic* - a futuristic ball game certain to make its way into the Match of the Day.

BALLISTIC

Psygnosis ■ ST & Amiga £19.95 ■ Available end of April
A new genre in the pipeline from Psygnosis is *Ballistic*, a walled ball game crammed with eccentric game-play options. There are magnets which wrap the balls away from you and as you go for a goal, splitters which divide up a ball and scatter the pieces across the playing area and arrows which drag the speed of play to supernight speeds. Lots of other oddities such as boosters, blowers and bumpers open a massive 150 different patches.

SHOCKS BOX

This month we've had standard adventure games courtesy of Microgen, weird adventure games, traditional shoot-'em-ups, a ball game... and then *Populous*, a brilliantly idiosyncratic release from Electronic Arts.

In its trademark British Turkey Pudding go a host of gaudy games which just didn't make the grade. Commodore had obviously retained Eddie Edwards as consultant for Electronic Arts' simulator on the Amiga - warty shaped characters tip-toed down the stairs like they'd never seen a ski in their life. Then there was *Tomahawk's* *Demons* on the ST, a gambling game where the main objective is to release every female in sight of those cumbersome outer garments. (We might have forgiven that, but it hysterically disappeared on sight.) All that's *Human Killer* Marlowe was an average shoot-fighting game which suffered the being on sets that even a one-legged amputee could tug everyone in sight.

Solution's *Prison*, yet another shoot-fighting game, definitely gave us all some of the very best laughs. We spoke to the programming team and they didn't even know what computer the game was written on - nice to know they understand the computer game.

On the better side, Microgen's *Spectrum* for the Amiga offered some really brilliant visuals in a flying game based around the film of the same name, but was just far too slow in the end. *Barbarian II* also made it into the Preview column this month but despite a really improved graphics and great graphics, it was not done by all the other superb releases.

In the games that did make it are certainly some of the best releases so far. *New Amiga* games in this month out-numbered ST releases by almost two to one - it looks as though the Amiga's superior graphics and sound capabilities are at long last winning it the battle for leadership of the 16-bit games market.



▲ The latest addition to the blockbuster series - *Adventurer's Real Ghostbusters*.

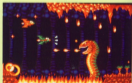
REAL GHOST-BUSTERS

Activision ■ ST & Amiga £19.95 ■ Out in May
Oh, so the first game of the series of *Real Ghostbusters* was a bit disappointing, but here's the real *Real Ghostbusters*. If there's something weird in your neighbour's house, if there's something strange and it doesn't look good then game what your city has been overrun by an army of ghosts and ghouls threatening to wipe out all remnants of human life. You'll need to visit your way through 12 different levels by ridding the ghosts and then getting them with your electron beam. At the end of each level there's a monster guardian ghost to be disposed of if you're going to find the key which gives you access to the next level.

Different screens include grave yards and cemeteries in a *Ghostbusters* style. 8 way scrolling areas.

BLOOD MONEY

Psygnosis ■ ST and Amiga ■ £19.95 ■ Due May (Amiga first, ST close behind)



Psygnosis are largely regarded as the leaders in the field of shoot-'em-ups, having already released the hugely popular *Moscow* and *Bad Blood* in very much in the same role with the intention, as ever, being to beat everything in sight. Preview of the screen shots look astonishing - we can't wait to see the full version.

BATTLETECH

ACTIVISION ■ ST & Amiga
£29.95 ■ Available in May

From the Intelligon studio comes this new role-playing adventure game which sees you assuming the character of Jason Knightland, a warrior robot who must protect his planet, its honour and his life. That's a lot for one person to be lumbered with, but pleasingly you don't suffer a nervous breakdown first than you should manage it. The main selling point of the game is the arena - a global arena module which you can play in order to increase your skills and accumulate riches.

BattleTech claims to feature the largest role-playing game environment ever created, spanning a mind-bogglingly four million locations.

AIRBORNE RANGER

MICROPROSE ■ ST & Amiga
£29.95 ■ ST in April, Amiga following later

This 'action-strategy' game features a total of 12 separate mission areas across arctic, desert and temperate climates. To overcome the demanding size of



the title Airborne Ranger who must complete each mission by packing the necessary supplies into three supply containers. These need to be dropped at tactically advantageous points over enemy land. Has it's into your floppy aircraft for a parachute descent into the unknown.

When you get onto the ground you need to design of your bulletproof armour in order to reach your pick a point and return to safety. If other missions are anything to go by, this one looks sure to feature quality graphics, sound and addictive gameplay.

OUTRUN EUROPA

US GOLD ■ ST & Amiga
£29.95 ■ Out in June

After all the hype, when the original version of Outrun was released last year it did't straight into the number one position. However, it was recently crowned for some considerable periods as leading and general

MILLENNIUM 2.3

Activision ■ ST and Amiga ■ £19.95 ■ April release

The year is 2066, Earth is uninhabitable after pollution with an asteroid. You've been left on the Moon and must transport Earth into a habitable condition using whatever resources remaining. Resources include a library of research labs, mining facilities and a small generation. The only way of ensuring Earth's future is to build a spacecraft fast time to shoot.

The game aims to combine tactical strategy, 3D arcade action and a host of puzzles to solve.



movement. These, claim Probe software, the programmers of Outrun, have largely been resolved in this new variation on the game.

Have you taken your testosterone across different areas of Europe, driving through such varied landscapes as France, Switzerland, Italy

and West Germany. Rain, snow and fog are of additional extras included to speed your progress through the many levels.

VIGILANTE

US GOLD ■ ST & Amiga
£29.95 ■ Out in June

Guardian Angels, move over! This rule is in, and it's your job as a redneck cop to defend your people's turf. Beyond general mayhem, the game has kidnapped Macromed, most people would say let them keep her but the game assumes you actually want to release her - really mad! In this new street-fighting game you have to combat menacing groups of doleheads across a whole range of downtown locations from bridges to alleyways - all really picturesque! The game concludes with a spectacular fight on the top of a crane.

ACTION STATIONS

Don't just sit there, get stuck into this month's rip-roaring reviews

FORMAT GOLD



Ultima V

Is Ultima the ultimate adventure?

Microprose

68



Populous

How To Be God, part 1

Electronic Arts

72

REVIEWED

Cyberlord II

Demaris

Titus

Zak McKracken

Silverworm

Hexxon

Rainbow Arts/US Gold

Titus

Lucas Film/US Gold

Sales Curve

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The Ultima adventure series has been around for years now and they've had a strong following in the adventure/rpg playing arena. In this latest game you guide yet another party of adventurers on a series of quests to save the world, destroy evil and generally persecute poor innocent trolls who want nothing more than a quiet life and the occasional tasty adventurer to keep them at their peak. Pick up your trusty sword, don your armor and light your torch for a trip into the underworld of Ultima V, *Warriors of Destiny*.



▲ *Ultima V, Warriors of Destiny*

INTERACTION

Control of your party of adventurers is achieved by means of single key arrows. Spell casting often requires two or three presses but most options are fairly easy to remember since the first letter of a command is often used. A quick reference card is supplied to refresh your memory when necessary. Movement around Britannia is simplicity itself, and via the cursor keys to go north, south, east and west.



▲ Before you begin you must create a party of three adventurers, willing to take on the awesome challenge of saving the kingdom.



▲ Generating your character is accomplished by answering a series of questions.



ULT

MICROPROSE

ST - Keyboard, Reviewed, 228-2

AIM

The Kingdom of Britannia is ruled by the benevolent sovereign Lord British (BL), so the names are tucked. Recently the Underworld was discovered and, driven to curiosity, Lord British set forth on an expedition to discover its mysterious secrets. Unfortunately he didn't

run for advantage when you engage in a battle is the number of hit points you can sustain. Experience is gained as you progress through the game and comes in useful when you want to expand the benefits of magic — more of that later.



return from the expedition and so Blackthorn took control of the throne of Britannia and, in true Gothic style, imposed martial law to keep the peace. The objective is to ensure that Lord British is returned to the throne and all his evil allies defeated.

Moria begins with a trip to the gong who asks you a lot of questions designed to test your morality. During the game your responses will affect how other characters react to you.

One of the first things you should do is to view the status of your party. This lets you see statistics: strength, dexterity, hit points, hit points maximum, experience and magic. These provide you with details on everything from your power (which

can be advantageous when you engage in a battle) to the number of hit points you can sustain. Experience is gained as you progress through the game and comes in useful when you want to expand the benefits of magic — more of that later.

► In the heat of battle, the combat mode offers considerable choice in the formation of your 20 moving a battle can be made easier by withdrawing injured troops and replacing them with their own.

GRAPHICS

The graphics are bright and colorful, but lack detail in the game itself. The opening sequence however contains some very good pictures, it's just a pity that there hasn't been more attention paid to game graphics. Spell animation wouldn't set the world alight especially since characters are so small you can lose them altogether if you turn the brightness down on your monitor.

Fortunately it's possible to get a text description of most of



► East Hinds ◀

▲ A map of a castle called up after looking into a crystal ball.

ULTIMA V

£39.95

Arrive - Out at the end of April.

In combat you choose a number 1-7 to cast a spell.



GRAPHICS AND SOUND

and sound, depending on and that can make the game stand out from the rest.

However, and good and bad, the graphics and sound are not as good as those of the previous games.

There are sixteen battles also, and these allow you to move around the playing area or engage in combat. They may not be the most imaginative piece of music ever devised, but at least they vary and you're unlikely to be drawn out.



STRATEGY

Ultima is played on three levels: countryside, buildings and combat. With the countryside display your party is represented by a single character who moves under cursor control. Monsters are shown as single characters and if you're not in the mood for being backed to death you can always try and outwit them. If you come across a building or village then you can venture inside at which point the display switches to a building map. In this mode you can interact with people and objects but if you do anything wrong here you'll end up fighting for your life. This is where the combat mode comes in.

Combat routines are extremely flexible, giving you



▲ A dreadful evil surrounds the opening campaign. One of many screens to fill you in on the experience.

opportunities to change battle formation during fights or retreat the wounded and replace them with healthy characters. When your hero is approaching, you can use your mouse-aimed characters to attack and then switch to change other characters for close combat. This helps to weaken your foes and can improve your chances of survival. As with all fantasy games there's the usual range of mysterious spells and, just to preserve tradition, there are eight different spell levels which may be cast by spending magic points. Ingredients are required and should be mixed beforehand because there's insufficient time during battle.

► Monitoring the actions of a typical Ultima village.



Although violent settings are dangerous they can also be very profitable. Monsters have always been known to hoard treasure and the ones in Ultima are no exception. The problem here is that the more treasure a monster gets the grubbier they get, the laughter becomes.

Detailed descriptions of your friendly neighbourhood monsters are available inside "The Book of Lore" which is supplied with the game and also contains a great deal of other useful information designed to get you started on your adventure. In addition, there's also a diary record from the faithful expedition of Lord Britain and a cloth map of Britain. Not only does the map come in handy for drying up your cape but it's useful as well.

CONCLUSION

Ultima V is not a game that you'll pick up and complete in ten minutes but because it's designed for people prepared to engage in sustained playing. As such there are options to save your statistics and location onto disk and continue playing again later. The aim of this version is roughly twice the size of that in Ultima IV and if you've played the previous adventure then you can take characters from one game and import them into here. This feature has been part of the entire Ultima series



▲ Exploring a castle roof top.

and for your adventures. It's excellent. Even if you do complete the game once then you're not guaranteed to be able to do so again, the combat helps make sure of that, and no two games are identical. It's debatable whether it's a true role-playing game or but it's definitely the closest thing yet.

Gary Barrett



▲ The spells of battle, a cheat.

with	5	4	3	2	1
animation	5	4	3	2	1
soundtrack	5	4	3	2	1
loading interest	5	4	3	2	1
Overall 88%					

▲ The rocky art of mixing spell components.

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When God sits up there dishing out his judgments there's not as awful lot you can do about it. Prayers are a bit old-fashioned these days, and it can be hell to get the Royal Mail to deliver a note up there. But now EA have released *Populous*, you've got the opportunity to change all of that. And just to prove its pedigree, it's written by the Bullfrog guys who were responsible for the legendary *Fusion*.



▲ And they look insured, too!



ELECTRONIC ARTS

Arriva - Mouse. £24.95. Reviewed.

POP

GRAPHICS AND SOUND

Graphically, the game has been very well designed. You view an isometric look which displays the map as well as a 2D view similar to specified areas. Jobs on the main map indicate the followers of good and evil and when given an idea as to the strength of your followers, fear is this is a strong side which means up during the gameplay to where you what kind of stone towers you can construct, such as earthquakes and bombs.

Raising and lowering land looks effective and there's no problem in distinguishing different levels. The followers aren't instantly drawn and lowering the land underneath a house causes it to disappear rather than crumble to the floor. The choice of towers rather than what some interventions - earthquakes prompt a flood water and then everything vanishes. In the case of floods, you take a heavy in everything drowns and then almost the entire map also appears into the ocean.

Sound effects are brilliant. A music channel takes place in the background which is very atmospheric. Additionally there are a small range of spell effects which appear when you unleash an earthquake or flood. An accompanying dialogue like a blacksmith at work indicates a tower type and you can then use the sound of combat.

▲ Placing a swamp can give your army a boost. But if you make a flood you can radically alter the entire map. Unfortunately you can suffer pretty badly as well that the followers can be wiped out.

▲ Placing a swamp can give your army a boost. But if you make a flood you can radically alter the entire map. Unfortunately you can suffer pretty badly as well that the followers can be wiped out.

you need to decide to give the role of one of two gods - Gung, either God in the Day or the God is to thank your opponent by manipulating your dedicated activities into battles with the enemy. The playing area is a stunning landscape, and you've got to build houses for your followers to sit, then do you see this delicately animated, before the opponent gains them. Your power increases in colonial proportions as you gain followers. With your opponent trying to do exactly the same thing on the opposite side of the map you soon realize that one world will win big money for the two of you.

Followers can only build their homes on flat ground so you need to use the mouse to select areas of landscape and either raise or lower it into its level. Your people will then come along and build on the land, but small challenges barely large enough to pray in and then a decent sized home. Followers will disappear into these places and do whatever followers do, afterwards several new members appear out of the final view. If all the land around the house has been leveled then a castle will be erected.

This might seem like fairly basic stuff but where things really hot up is when you start employing a lot of divine intervention to stop the other side's houses for yourself. As your power increases you're able to select areas of the map and then cause havoc with everything from earthquakes to floods which can really get to be great fun. If you've really got something against your opponent then there's also the opportunity to flood found a good level of disease.



When you've completed a game by either surrendering or annihilating your enemy then you progress onto the next map. There are four in total maps showing three world continents - desert, ice fields and grass. In addition you can customize your own map to make it as interesting as possible.

POPULOUS

97 - Available mid-April.



Expanding the player's empire.

AIM

to play
the Divine
Empire
of Socrates
to play
to get to
the 20-year
opposition
to the
to the

STRATEGY

If you start you must
then a paper magnet some
where on the map. You can then
pick a leader and instruct him to go
towards it, taking all your followers with
him. He'll venture on, finding new territories
and relying on you to flatten the land for him.

The game works by selecting somewhere to
go on the main map at which point you're presented
with a detailed view of this section. Although it's easy
enough to view the land on your territory you cannot venture
into the domain of your other land.

When the game has progressed this far you can start to
engage in all manner of scamious activities. You can indeed your
followers to engage in fights with the opposition whenever possible - this
city has any effect when you come across an enemy occupied focus.
The power will emerge and you will fight to the death. Should the focus
occupy less than 10 focus will be burnt down.

Making use of the range of divine effects which include earth-
quakes, floods, disease and even amnesia is fine but unfortunately
your enemy has a tendency to play dirty and use the same disas-
ters on you. By viewing his territory you can decide which are
to meet heavily built up areas and then run his day by
making a volcano. It's the floods which can really
cause problems - all 8-edged damage will not only
obliterate most of your enemy's territory but
you can also lose goodness to a large
extent of your own land. The entire
outcome of the game can be
changed with this kind of god-
effect.

4 You must be careful to take
care of your people. The
leader has his focus point.
Landed at it's worth
watching even though
you don't have
much map in the
picture.

CONCLUSION

Populous is a strategy game but at the same time the action pro-
grammer had enough to grip even the faithful soccer-mad addict. If
typical game can take around an hour to play but by selecting differ-
ent options and rate levels from a menu you can alter this to suit
your requirements. There's also an in-game strategy menu which can be
brought into play, such as status or bottomless weapons, built up
and spent on as you wish. These will affect both players but further
means can restrict each player individually so, for example, floods
cannot be used by the Devil or God cart as an earthquake is.

Populous is an excellent game - graphics exciting and amazi-
ngly addictive. It's one of those games which you just can't leave
alone. From the front screen, where you'll spend most of your
time, is unusual enough to keep you intrigued. As well as a
menu which allows you to pick up strategy hints, your
computer can be another human connected via a
modem link. The advantage of this is that you can
find an opponent from miles away or assemble
a single team for another machine just not
to frustrate your grand strategy.

The only real criticism of
Populous is that whilst 92
percent have to wait several
more weeks to get their
hands on this divine
release.

Mark Hyman



There
are three differ-
ent stages of development
in mastering the land. Starting off with
a level but you can soon end up with something
resembling Buckingham Palace.

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CYBERNOID II

HEWSON

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Under the cloak of night, when the bats come out of their hiding places and man finishes



pulling the gunge out his earhole and buries his head under a feathered

cushion, *Cybernoid* comes out of its hole to protect the world. *Cybernoid II - The Revenge* is the sequel to the classic *Cybernoid*, rightly famed for its brilliant graphics.

GRAPHICS AND SOUND

The graphics of the original *Cybernoid* were always regarded as the flashiest ever and *Cybernoid II* has gone even better.

There are no massive sprites but the expanse of colour used in the weapons is what makes it graphically exciting. Scattered missiles move around the screen at pretty fast speeds and in a range of bright colours. There are a lot more obstacles included in this version which combine to make things harder. Roving space blobs and rockets seem set to put an end to your activities.

A simple musical tune plays during the game but thankfully there's an option to turn this off. Sound effects aren't particularly inspired and appear every time you fire a missile or get hit.

GAMEPLAY

The Federation have recruited you as a security guard to protect their storage depots from attack by pirates. It wouldn't matter if they were just after your body but these pirates have designs on your latest valuable minerals, jewels, ammo and all the best battle weaponry. When you blast the pirate ships they'll drop their cargo and you must then manoeuvre your ship over the top of it in order to reap the benefits.

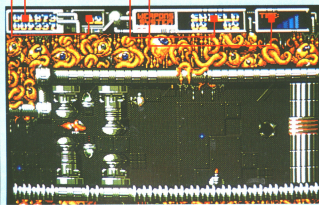
Some of these objects will offer you external weaponry which can change the appearance of your *Cybernoid* ship and come in extremely useful on the tougher screens. Collaring the occasional pirate craft which drops off a yellow canister is a major bonus since it increases your amount of weaponry by one.

The original *Cybernoid* offered five different types of weaponry but the new version has



increased this to seven. These include time bombs which can be left at strategic points to explode a few seconds after release, as well as seeker missiles, great for leaping around the playing area and destroying your quarry. The Tracer weapon is great fun - it darts around the edge of the screen wiping out all the emplacements in its path. As ever, most useful are the defence shields which come in handy when you're facing an onslaught of hungry missiles.

■ Remaining ships ■ Weapon mode and remaining weaponry
■ Value of cargo ■ Time left to reach end-of-level



▲ The full *Cybernoid II* screen.

CONCLUSION

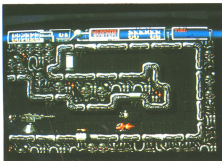
With better graphics and access to a far wider range of weaponry, *Cybernoid II* has become a considerable improvement on its forefather. However, the gameplay remains identical, if more difficult. What's good is the way that once a level has been loaded no other demands are made on the disk drive. Consequently you cannot save your hard-earned high-scores, but with this type of addictive gameplay the opportunity to go back and play without waiting for intensive disk accessing is a definite bonus.

Mark Higham

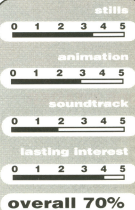
ST VS AMIGA

The Amiga version is an exact duplicate of the ST game, with identical graphics and sound.

Considering the extra features of the Amiga a bit more should have been done.



4 The full *Cybernoid* screen. The objective hasn't changed from the original version - you still have to protect the Federation base, but you've got a whole load more firepower to do it with.



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GAME BUSTERS

SWORD OF SODAN

Amiga

If you're having trouble completing the Format Gold from last issue then you might find these tips invaluable.

1. Start the game as normal, choose your character and start on the first level.
2. Set yourself killed on level one.
3. The high score table asks if you want to replay or start a new game. Select the later option.
4. Choose the same character as last time and keep pressing return



By Tom Cross (Amiga)

Is life getting you down? Is the end nigh? Do you spend most of your time sitting in wreckage and exploding on screen? If the answers to any of these questions is yes, you need a dose of pokes and tips courtesy of your caring, sharing ST/Amiga Format.

will level one be loaded.

5. Press return once more and an exclamation mark appears over the place where your boat should be. The note here reads: 'here'.

6. If you press the return key again you'll go to the next level.
7. The process can be repeated up to the final level, so you can really complete the game.

Andrew Bostock

News@to-sport-Tyco

SODAN Switch the radio off and back in your shipburners. If Miss Galt is track you, the autopilot will turn you around for a head to tail.

Decrease thrust to military power, turn on the radar console mode. When the target is at low range, separate off a burst of missiles and scratch the flag.

If you take a well placed bullet or missile up your air then your engine flames out. Instead of banking out, swing around and head for home. Press (H) and (+) on the numbers pad and keeping them depressed. The F10 will stay level and drop down. Switch to tracking mode and rotate to a safe size. Just before touch down, flick up the nose and the plane will touch down successfully easy

late. Select mid mission and you will be rescued even if a enemy territory.

Angelo Tommaso
London

BATMAN

ST

The complete solution to the first scenario, 'Bird in the Hand'.

Go left and collect the Batwing



KINGS QUEST 4

ST

Here's a real no-brain guide to the early stages of the game. Stay clear of the signs, hounds and nasty trees. As you wander around you'll see a bird tagging at a woman, get it and go to Leland's castle. Leland will tell you to get the mirror.

Get the golden ball from under the bridge and then go to the pond with the frog (swearing a crown) on the lily pad. Stand to the right of pond and throw the ball into it. The frog will retrieve the ball and sit by the pond. Get the frog and kiss it (gaggle) and it turns into a pig you get a key, a mirror you give you the crown. Pick up the ball again.

Go to the pillared pond and throw something it will rip apart. When he flies away get the key and two arrows (don't chase with rapid, he can be a mean duck). Find the worms and shoot it once with the bow.

Go to the old house and get the book from the shelves on the left hand room. Look at the picture at the left looking to the left. Pull the latch in the left wall and go into the secret stairway. At the bottom of the stair

you'll find a shovel which you should take. Play the organ if you want, you don't score anything for doing so.

Go to the meadows and you'll meet the merchant. Give him the book. Take his life and then go in search of Pan. Play the lute and left swing you be his fate. Go to the beaver house and give it a good clean. They will leave some diamonds behind in gratitude which you should take (anyone know if those diamonds need a full time cleaner?).

Head to the mines and give the diamonds back to the dwarf on the left hand right. Get the letters and the diamonds. Head for the fishermen's cottage and walk along the pier. Go back to his cottage and give him the diamonds, take the fishing pole. Get back to the end of the pier, put the worms on the hook and catch fish.

Go to the waterfall, wear the crown and turn into a frog (you handsome devil). Swim under the waterfall and get the board at the mouth of the caves. Light the letters and then save the game.

Enter the caves and note what you can

get passed the trail there are two mirrors. Save again. Find the thorn, probably by falling down it and put the board across the thorn, cross it and then get the board again. You will exit the caves in a swamp. Jump across the line of reed clumps. At the last clump before the island stop and get down the board.

On the edge of the island play the lute to mesmerize the cat and quickly get the magic fruit. Walk back across the board and jump back over the reed clumps. Swim again. Enter the caves and cross the thorn with the board on.

Below. Swim and walk to pass the frog as before. Get the bone at the cave, eat it and swim under the waterfall. The rest is up to you.

Ray Staff
Hillingdon,
Middlesex



ROCKET RANGER

Amiga

To avoid missing the professor at the shoot-down the Nazis, they can't go far to increase their efficiency. You will waste valuable time unless you rescue him from the propeller while he is over the Atlantic.

Shooting the gunner in the gorilla is tricky, the best method is to shoot below the gunner and



and right until you are on target. Gradually move up until you hit the

gorilla. There will be a flash when you hit it. It's important that you stop firing now. After a few seconds have elapsed you'll be made the gorilla which is where the fun really begins. It takes lots of practice getting here, but it's worth perfecting.

The next thing to do is find a supply of Lunarium before the first boss supplies run out.

To do this you need to infiltrate the Nazi base which receives vital Lunarium from the Moon. The base can be located in South America or Africa. Once infiltrated, your agent here will carry on sending you Lunarium throughout the game. However, you will have to storm the Nazi base first. Destroying the professor and getting hold of a Lunarium source is just about beginning—

John Chassy
Chesham, Herts

and then go down through the door and left. Collect the grenades, go right and collect the specimen. Use the specimen and drop it. Head right and get the key and badge.

Move left and then up. Pick up the disk and use it. Use the lantern and leave the illuminated at the edge of the window and throw the lantern at the Pezang's men when they appear. They will eventually drop a pocket of crisps which can be eaten when your health is low. Stop

going left. Move right until you reach a door and use the key to open it. Drop the key and enter. Go left and through the wall door. Pick up the magnet and walk right and through the door. Go right then down and through the first or second door. Head right until you reach the room captioned "Shadows everywhere". Walk through the door, go right and collect the food. Move left until you reach the dead end.

Use the grenade to blast



blowing and they'll run away.

When leaving the secret cell from the ballroom go left, collect the sword and continue left. Pick up the lantern, go right and then climb onto the roof. Head right to collect the torch and return to street level. Go right until you get to the warehouse and then show the badge to the policeman when he appears. He'll let you continue.

Pick up the telephone and climb onto the warehouse roof after



RAMBO III

ST & Amiga

When you're in the second building always wear the left's red goggles. Never walk in front of the soldiers, otherwise the alarm will go off.

If you come to a dark room then use the glow tube. Never use a gun unless you have a silencer fitted to it. It might not seem too healthy but always turn off the electric door by walking into the switch on the wall. The time detector will only work when you have located all parts of it. The mine rep program only function properly when they have batteries.

Never stand on the infra red beams which cross the floor otherwise the alarm will go off.

Andy Muller
Buckham

through the wall. Carry on left and go through the second door. Head left and then down through the door. The room will be captioned "Gettling you down". Use the Bertram to go down and then get this at key after going left. Return right and go through the door. Use the transect now.

Move right, down right and collect a badge then go left and through the door using the torch. Go right, up and left and get the dart. Retrace your steps in the screen where you dropped it in by rope. Use the left key in the left. Drop the left key and torch. Go to the room where you used the grenade and use a dart from the dart board. A password will appear and you must pick it up. Leave the building and go to the mansion.

Use the password to enter and then go left and up. Get the key and go down, right, right, up, left, up, left and up the stairs. Go right to the end of the corridor and down through the door. Pick up the video tape. Head left, down, right, down, right and up through the door. Go right and then through the large white door using the key and pick up the disk with "Word written on it."

Go back through the white door, right and up through the larger white door. Head right and enter the transport. Go to the Pezang's computer and insert the video disk. The computer is raised and the Pezang's plan told.

Timothy Hodges
Peterborough, Cambs

DALEY THOMPSON'S OLYMPIC CHALLENGE

Amiga

To start on any event with J-Lane of Lucerne do the following. When the high score table appears, type in 99999999 and press [Enter]. The high score will now show the heading "Demo". Type in -J- and press [Enter] again. The table will now be called "Mega-Demo". Press F1 to F10 to start on the relevant event with lots of help stuff.

Paul Bennett
Reading

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If you have some cunning friends, powerful parents or a gambling eye for ST or Amiga games? If you do then don't be mean — share them with the rest of us by sending them to Game Buyers. Not only would that give you a considerable and generous person you are, but there's the added advantage that the first five or six of the month win a bundle of the latest software prizes. There's an ST and Amiga prize, or get nothing. Send your tip to Game Buyers, 10 Amiga Forum, 4 Queens Drive, South Hill, Epsom.

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DENARIS

US GOLD

Amiga - Jepshton, \$24.95. Reviewed.

ST - No version planned at present.

Those galactic fiends are at it again. You've been just enough time to get over your last attack and what do they do? Repair their lasers and start shooting photons at you again. Denaris, previously named Katana, is US Gold's answer to the hugely popular *R-Type*.



A menacing space level too. As with the arcade classic, *R-Type*, you come across a host of weird creatures which you must defeat.



Between the savages of out-of-control computers and the unfortunate effects of nuclear war, the planet Denaris is in a fairly poor state.

The idea is that you must fly over the contours of this over-powered planet and rid it of its robotic enemies. There's an advantage to this kind of vicarious extermination - lots of death without the blood.

It's a vertically scrolling shoot-'em-up with enough enemies to make you wonder if you were really meant to be around. Besides blasting everything that moves and looks as ugly as a politician, you need to avoid the occasional indestructible missile and pick up additional weapons. These aren't set a bonus, they're an essential. Unless you're well-equipped you'll never get very far.

Weapons range from a scatter-shot which will fire several missiles with each tap of the firebutton, right up to a power-shot and multi-directional lasers. Besides these, there is a special attachment which will speed up gameplay. This might sound

like a great idea but steering your ship around at faster speeds is not to be advised - you drop dead quicker than an armadillo in a gas chamber.

Towards the end of each level you encounter one super monster. He doesn't generally move around too quickly but he makes up for slower like a sponge. You'll need to have acquired more than your fair share of weapons to make an impression.

One of the best features of Denaris is the way you can recover weapons after destruction. When you get killed you can start again in the middle of a level, provided you've progressed far enough. Both laser weapons and the good old power shot appear almost instantly so you won't need to face an onslaught of ugly creatures without the laser requirements of all space explorers.



GAMEPLAY

4 Eight lives are enough to get you as far as the end of level 10, which is usually what are awarded very smoothly considering their size. On the last side, they can up to reach five-power you need to have acquired lots of special attachments if you're going to fill them with lead.



GRAPHICS AND SOUND

Nobody would expect that the vertically scrolling shoot-'em-up is addictive but it's such an old idea now that it takes a lot to make this type of game original.

When Denaris really works it is the brilliance of its graphics. The scrolling is smooth, it's a little slow at times. The huge number of different monsters which range from odd little alien-like heads to wandering robots have been superbly animated

to such a degree that it gives you a warm glow watching them vanish in a puff of smoke. In addition, the end of level monsters are massive creatures which have been designed to look as menacing as possible.

Sound effects are also a cut above average. Beyond good feedback music, there's an incredible sound effect with shooting phaser missiles over the gentle purr of your craft.

CONCLUSION

There's been much controversy over Denaris' similarity to Atkinson's *R-Type*, and it's not unfounded. Denaris is almost identical to the *R-Type* arcade game. However, it's far superior to the ST conversion with better savings of well-refined graphics, smooth scrolling and a more sophisticated level design. The whole game. There's still an identifiable wall between levels but the arcade action is as addictive as ever.

Mark Hughes

SCORE				
0	1	2	3	4
ACHIEVEMENTS				
0	1	2	3	4
REACTING INSTANTLY				
0	1	2	3	4
overall 83%				



TITAN



TITUS

ST - Japanese, mouse and keyboard. £29.99.
Reviewed.

Amiga - Japanese, mouse and keyboard. £29.99.

When you lie down does the room spin around you? Do you feel confused and aged? In that case you've either been knocking back a few too many Perrier waters at your local, or you've been playing Titan too long.

GRAPHICS AND SOUND

Intoxicating visuals are what keep this game alive. It's amazing just how fast and how smoothly everything moves when you start trying to catch the ball.



Your ball is constantly in the centre of the screen and any movement causes the background to move around at lightning speeds. Since every backdrop is patterned, the facility causes your eyes to bounce around their sockets like Superman's taken a prook or run to them.

Sound effects aren't particularly great but in a game such as this there's not really a lot that can be done.



• The action spans 80 different levels, the earlier ones are easy but when you come across the skull and crossbones that's the time to worry.



• There's a certain level of skill involved in learning to manipulate the ball. On some levels you encounter walls which can be destroyed by your racket. If you then direct the ball through the gap that you can watch as it single-handedly destroys everything in its path - brilliant!

GAMEPLAY

Mr Hyacin, who sounds like a character of dubious honesty, has been an interesting fellow. You see, he decided that the average life expectancy of human beings was getting to be just too long. So he came up with the perfect idea, short of euthanasia, to rid the streets of all the wrinkles. He created a game which would drive everyone mad, and guess what? It worked.

The idea is that you've got to use your magnetic racket to direct a rebounding ball around the different levels, knocking out bricks. Sounds tedious? What prevents this game from repeating its brutal ancestors is the ball's fast scrolling techniques, the ball's eye view and a host of sound effects.

There are several skulls scattered around the playing area. A moving skull and crossbones is the worst obstacle you're likely to encounter. If either the ball or your racket collides with these then the result is instant death. The Crossbar is an odd fellow - meet it down a dark corner and it'll cause your racket to switch positions with the ball. An amusing feat when you're trying to catch the ball as it flies around the screen about to hit one of the dead-

est skulls. As with most of the Titan environment, it will take some time to get used to but it's a great fun.

CONCLUSION

Titan is the kind of game which has you reaching for the Optima after an hour - and that's got to be good. It's very much in the grand old vein. Some of the levels are ridiculously easy but the more they progressed, the more they compensated for impossible screen scrolling, the increasing skill and crossbones. Thankfully, eight lives give you enough opportunities to take into the 80 different levels. Stunning, superb graphics make this one as addictive your eyes turn into spinning, kaleidoscopic black-holes.

Mark Hughes



graphics	★★★★★
animation	★★★★★
sound/effects	★★★★★
learning involved	★★★★★
overall 79%	

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Is the world's population becoming stupid? Why are squirrels getting mad and growing spurs heads? Are we world being invaded by aliens? Will Zak find his true love, or have to live with South the glibfish forever? All these questions and more are posed in Lucasfilm's new game. Whether you get to answer them depends on whether the alien mindbenders held your brain first.



▲ The control room in the game.



News anchors can be made to move by clicking at the correct locations or selecting from a set of actions.

ZAK McKRACKEN

and the Alien Mindbenders

LUCASFILM'S GOLD

ST - \$24.99. Mouse and Keyboard. Reviewed.

Amiga - Out Now. \$24.99.

ST VS AMIGA

There is no difference at all between the ST and Amiga versions as far as graphics and sound are concerned. However, the ST version is supplied in

three disks as opposed to the Amiga's two disk games. Consequently the Amiga version requires far fewer disk swaps during play.



▲ The alien scene in the game looks already. You can come to this secret room if things get dull - there just are hidden to provide a laugh.

GRAPHICS AND SOUND

The scenery is fairly colourful and objects are recognizable, which is fortunate because at times that's all you have to solve a problem. In case you can't understand what's going on a "What is going on" multiple text string tip box.



Animation isn't brilliant - Zak and the crew walk stiffly and even South, the glibfish, seems pretty around the face. Fortunately this doesn't matter too much since it's an adventure and animation is less important.

Sound effects are fairly simple things such as turning water, garbage disposal, boxing gloves and footsteps. Nothing spectacularly mind blowing, but they serve their purpose.

GAMEPLAY

Zak McKracken is a young reporter from the National Inquirer, a typical kind of Fleet Street paper which would rather make up stories than report the truth. Zak wants to win a Pulitzer prize but knows he won't get one writing for the Inquirer. So he agrees to take on one more assignment before leaving to write a novel. He's sent to investigate a mysterious square and delve into a spaceship story. Little does he know he's heading into an alien plot to make the world look stupid.

The action takes place

across various parts of the world, all of which can be reached by plane. Occasionally the scene switches to "A secret room" where aliens are executing their standby plan, apart from letting you know what's happening their activities provide some light relief.

You begin in your bedroom and must find objects and solve puzzles in that adventure style. As the game goes on three other characters emerge: Anna, Lulu and Melissa. Doing these bits helps and teaches you how to interact the world from a slightly

CONCLUSION

Zak is a Change from standard text-based adventures, offering problems which can be solved using some good, old-fashioned lateral thinking.

What does open progress is the speed at which you move. In a conventional adventure you can cream across locations until you know the way, but learning the route here doesn't speed things up at all. But it's a great game, providing hours of fun.

Gary Burt



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
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SILKWORM

SALES CURVE

BT - Joystick or keyboard. \$19.95. Available mid-April. Reviewed.

Amiga - Joystick or keyboard. Available mid-April.

It's not true! Even after months of negotiations with the Russians and despite a mass exodus out of Afghanistan, we're still under threat. However, now that there's no one around to press the F106 button, the battle arena has switched to fighters and planes. Aside from a few improvements, *Silkworm* is a direct conversion from the arcade machine.

GRAPHICS AND SOUND

The basic *Silkworm* game is made of a multitude of different sprites, ranging from a collection of helicopters and tanks right through to super fast jets. Because of all the action taking place on each screen, the majority of sprites are fairly small and, as such, fit their purpose. However, they've been animated well with moving blades and smooth movement. It's

at the end of level obstacles which are graphically most pleasing. Tanks will steam tanks and a massive animated helicopter make up some good moments. Sound effects have been designed to that when you're in an enemy you get an audible hiss or when it's about to explode - brilliant because the opposite tone tells many things. It's the only way you know whether to risk, flee or hit low stock, or avoid the approaching missile.

Backgrounds are reasonably impressive although they have a tendency to become dark. A feature in this area is the addition of the occasional burst of facial lightning which is particularly prevalent in one level.

GAMEPLAY

The objective is to survive a tank of helicopters, paratroopers and jets long enough to reach the end of a level where your tank is thrown into question by the operation of a missile-firing game.

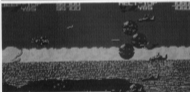
You fly through several landscapes in the guise of either a helicopter or a jeep. The helicopter is the most versatile, but comes under considerable attention from hungry missiles. If you choose to play with a fixed then both helicopter and jeep participate.

This is no easy challenge even the initial levels are so overpopulated with missiles and offending aircraft that it's difficult to survive long enough to get to the end-of-level cut. Your mission is made easier with multi-directional firepower, and is improved further by destroying the word goose.

By shooting at ground stations it's possible to

release a protective shield which vaguely resembles Harry Potter. There's more to this shield you're safe from attack until it disappears. If you manage to call up two such shields then there will act as a smart bomb and destroy everything on screen. Great for all of two seconds.

A The odd goose gives you twice as much firepower as you need to destroy it first.



A This is ground control in *Maver*. Yes, get up there and exercise your trigger finger! *Silkworm* is another fantastically exciting shoot-em-up providing dozens of levels of mass missile attack.

CONCLUSION

The original shoot-em arcade game featured no specific ending - probably because the makers thought nobody would get there. You face similar adventures in the computer version, but if you can't survive to the end then there's been a whole new battle ahead. It's a spectacular conclusion to the whole-screen leaping on and down and then crumbling to the floor.

For all it's action and attention to detail, *Silkworm* is still

just another shoot-em-up. At a cursory glance, the helicopter scenarios might appear impressive but it's no match for the likes of *Blitz* and *Demol*. Animated sprites aren't large enough and the later levels are so ridiculously hard that long-term interest doesn't last. However, if you were attracted by the arcade game then this is a good enough conversion to warrant picking up your stick.

Mark Rigden

graphics

0 1 2 3 4 5

animation

0 1 2 3 4 5

soundtrack

0 1 2 3 4 5

loading enhanced

0 1 2 3 4 5

overall 70%

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As reviewed in *ST Action* (December 1988)



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GRAPHICS

GOLDEN RULES

The following points should always be kept in mind if you wish to improve your animating skills and to impress others with what you can do.

- Always create a 'story-board' in plain English, outlining all the scenes, animation, & title planning, usually saving time and effort later.
- All natural motion occurs in arcs - only forcing things move in straight lines.
- Create all your 'key' images first, don't try 'straight line' animation (where the animation is the order it is to be viewed).
- Details and colour should be secondary considerations to getting the movement right.
- Don't be over ambitious, the way to be put off by attempting something complicated early on.

RABBIT

REVELATIONS

Richard Williams is the animator responsible for *Bugsy Rabbit* and *Whoopi*. Without doubt he is the single most important figure in conventional animation today. Richard uses many special techniques to give his animating a unique look and style. One of these involves shooting the frames on what is called a 'three frame run' (each film frame has the animation frame designated to it, an after-image from the previous frame) and a pre-image from the one that follows. This makes the animation look very smooth, but it also forms a simple rotation camera about into a nightmare. Richard happens to be fairly gentle by having his own Jeti camera.

WHO DIGITISED ROGER RABBIT?

Traditional art packages are passé - making your pictures move is the name of the game nowadays. But what do all the fancy animation packages do? MARK PICAVANCE begins a new series to show you how to produce convincing 3D animated graphics, using everything from simple paint packages up.



Over the next three issues, we're going to remove the mystery from creating moving computer graphics. Topics covered will include guard-rotating frames like 2D motion, character animation, vector graphics, ray tracing, special effects and advice on the software for creating animation.

To begin though, here's a jargon-free list of the pros and cons.

Advantages - it breaks the link with a dull, expensive, slow, art-drawings etc.; having apparent motion. The dictionary definition is correct, but gives no clues as to what is being attempted. The key phrase is 'having apparent motion'. In short this means up an animation.

To create motion it is necessary to construct an illusion of moving images from still images. Each still graphic is referred to as a 'frame'. The rate at which frames must proceed each other to create smooth movement is about 24 per second.

This is based on the number of frames projected frames per second that you will see when you view the cinema. In Britain the television system displays 50 frames per second; this means that when a cinema film is shown on TV, each frame is displayed twice ('on-double'), as it is called and the overall speed of the film is increased to make up the extra two

THE MAKING OF SNOW WHITE

The scale of effort involved in creating lengthy animation sequences using conventional techniques is difficult to comprehend.

A Disney feature can be classed as a large scale animation.

When Walt Disney created the first full length feature in 1937, *Snow White*, it took over four years, and required the skills of nearly 1,000 people. In addition, it cost \$1.5 million to produce. It was the first feature to be shown in a

hand-drawn Disney. The artists involved produced some 180,000 individual drawings and, in the process, exploited animation techniques in a new dimension. To give the animator's 'draw team' a standard job, the drawings were not traced with a pen but with a fine brush. This resulted in a smooth line which changed thickness gradually. Point was not in such large amounts that could not be made because a problem.

The solution was to have each colour produced in very large amounts. A typical container for a single colour held 40 gallons. The Disney staff team - not content with the 'painting' tool method - created the 'multi-plane' or 'multi-camera' method in a 30-foot room. It required the operators to use it, one of whom was suspended in wires within the room.

frames. Does that mean you've got to draw 24 images for every second of film that's 1440 per minute? Thankfully, no. Most conventional animation is drawn at 12 frames per second and each frame is 'held' or 'shot twice' when transferred to film.

In some situations less than 12 drawings are needed, it all depends on how much motion is occurring on screen. A simple rule of thumb is that

large movements require more frames than small movements. Images don't flow smoothly if there are too few frames. Very subtle and

Who does what?

In an animation studio the job of creating films is broken into specialised areas. As a computer animator you'll split these functions between yourself and the computer - if you like it or not. The computer should end up with all the boring jobs that's what it'll do best at - I'd. The job is conventional animation studios are:

Director - He initiates and controls the whole process. This enables him to assign animators by studying sequences of animation that may have taken hours to produce. He also creates the 'storyboard' from which the animators construct the story and take their timings.

Editor - together with the director this person takes shot sequences of animation and combines them into a finished film. It is called film, as a rule, little is con-



A Picture like this is the work of a computer animator. Created by Mark Picavance using Soft3D and rendered up with Photo Real. The ray-trace took a hour.



stably out. All the best arguments are between the editor and director.

Animator - the primary function of the animator is to sketch 'keys', the essential frames which describe what happens. He produces one or two for every second of film (that's more if the animation is complicated). He also rubbers and makes his drawings to help the storyboarder, the next man in the chain of events. In general, animators temper their creative urges by drinking too much.

More missions

Storyboarder - in some ways his job is as creative as the animator's. He depicts the scenarios made by him on their keys and storyboarders to generate the drawings that go between them. The ability to copy an animator's drawing style is vital. A poor storyboarder can make a potentially excellent piece of animation look ugly. The reverse is also often true, some animators refuse to allow good storyboards to be used. It is between their animating storyboarders' stress because animators take all the glory if a film is good.

Traces and gaints - the original drawings which make up an animation are created on thin paper so that several frames can be seen if they are overlaid and a light is placed behind them. For the animation to be filmed it must be traced onto a sheet of celluloid, called a 'cel'. The trace and layout work is usually done by the same people. Once traced, the cel must be painted. The paint must be applied evenly. Some people find this harder than animating. Trace and paint is generally done by people who like to draw what's going on, and no real desire to write. The rumor goes that some of the T and P guys working on *Watergate Down* believed that the film was about dorkies. They got into a shock when they saw the film.

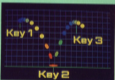
Storyboard camera - after the animation has been decided, animated, traced, and painted, it is loaded to the storyboard camera man who must shoot the combined artwork onto film. The 'storyboard' is a platform on which the animation is placed to be shot one frame at a time. Its special features include the ability to move the camera and artwork to create 'in-between' plans and 'zooms'. In all film it has adjustable, the camera man gives a detailed description of the shooting of every frame. This is called the 'step' sheet, and should be laid out in its directions. ■



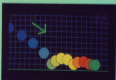
ANIMATING FOR THE VERY FIRST TIME



■ **Stretch and stretch** have been added to the ball. These are exaggerations on what gravity and inertia do to a real ball: the results are much more natural than the original animation. By adding stretch and stretch the motion becomes more dynamic. You can add too much *Stretch* though. Each subject will be able to take greater or lesser amounts of stretch and stretch. It's up to you to discover the limit.



■ **And here's the slight path of a ball drawing.** Because of the nature of ball drawings, the ball does not look as sharp as right and picture camera in-between. An interesting addition to the animation might be to make the floor give under the weight of the ball. If you accomplish this to your satisfaction, try shortening the distance of the bounce so that you can get an-impacts on screen. Make each subsequent bounce smaller so that the viewer gets the impression that the energy of the ball always gradually.



■ **All the frames of a bouncing ball animation** combined to show you the work required. If you draw a ball at each screen in the position shown and then flip between the screen quickly, you will get an animated bouncing ball. The key frames are marked clearly, so draw them first. The graphic shows all the positions of the ball (moving in the top-to-bottom and down again). The animation looks what animators call 'bony'. The ball remains a rigid circle throughout its path.

■ **The ball is much lighter in this animation** - a ping pong ball average - and consequently the motion differs. Notice that the ball moves very fast on the bounce, but very slowly at the top of the arc. The distortions are also amplified. The opposite to a ping pong ball might be a ball bearing - they don't bounce too well.

For this example you will require a piece of software that lets you draw simple shapes and store several screens in memory. Any computer can use *Paintbrush*, *Argis Animator* or similar. If viewers can use *Argis Animator*, *Cyber Paint* or even a slide-show program with pictures held in a RAM disc.

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ASSEMBLE YOURSELF

To the get the most from your computer you have got to program in assembler. Drop BASIC, C, Pascal, Fortran and get to the heart of your machine. What do you think the best games and sexiest serious software are written in? **TUBBY FOSTER** starts the series of six that will get you producing machine code sizzlers.

The Motorola 68000 family of microprocessors embody the most beautiful architecture to be found among today's popular processors. Code written for the 68000 will run on the 68010, 68020, 68030 and - say Motorola - any forthcoming members. The offers a simple and intuitively grabbing register path for programmers during the coming years. To see an Alan 27 or Commodore Amiga and not know how to program the wonderful 68000 processor contained inside is like driving a car with the handbrake on.

At first sight 68000 assembly language appears to be a formidable mixture of numbers and symbols. Inevitably the apparent confusion in a program section dealing with screen handling, say, seems no different at first from a section for reading the mouse. In truth 68000 assembly language - sometimes called assembler, machine code or code - is very simple. It is simplicity that makes any section of code seem much like any

other. Nonetheless, clear distinctions between different sections can easily be made by documentation, that is by placing comments at appropriate places.

In this and later articles you will discover that programming the 68000 is really quite straightforward. A reassuring point to bear in mind is that it is not necessary to learn the entire 68000 assembly language in order to write acceptable programs. For example, **MOVE.B**, **MOVE.L**, **ADD** - looks horrendous when compared to **MOVE.B**. In fact, it is just more of the same.

The processor works by reading numbers from either ROM or RAM. These numbers (machine code) are interpreted by the 68000 as instructions. Numerical instructions are very awkward for human beings. To understand that's why a set of mnemonics, collectively called assembly language, are used instead. A program known as an assembler converts the assembly language mnemonics into machine

code, leaving the resulting list of numbers as a file on disk. When the machine code program is run, by double-clicking on its icon in a GEM window (G) or typing its filename at the GJ prompt (Amiga), the numbers are placed in an unused part of the computer's memory. The 68000 is then instructed by the operating system - which is itself machine code (perhaps even itself) - to start reading the code and thereby execute the program.

Essential's drive!

Computers deal with single items of data called bits which can take a value of 0 or 1. However, it is often convenient to handle bits in groups of eight, 16 or 32. Bytes, words and longwords respectively. 8 is 2³ or 2³ bytes, 16 is 2⁴ or 2⁴ bytes, 32 is 2⁵ or 2⁵ bytes. A single byte may be represented in binary as

```
0 1 0 1 0 1 0 1
0 1 0 1 0 1 0 1
decimal equivalent
129 99 33 19 6 2 1
A byte represents 28 (256) different numbers: 0 to 255.
hexadecimal
00000000 0
00000001 1
00000010 2
00000011 3
00000100 4
etc.
11111111 255
```

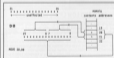


PROGRAMMING

REAL MUTTERS

For each machine code instruction the 68000 needs, it executes a short program in microcode using its own on-chip ROM. Microcoders are the real brains employed by semiconductor manufacturers. Some other microprocessors, such as the Zilog Z80, have 'hardwired' machine code instructions which execute directly.

MOVE TO THE BEAT



The instruction **MOVE.B** moves the number found in the word (two bytes) of memory location 20 into the register D0. A word is moved because the 68000 is a 16-bit microprocessor. In fact, the byte at location 20 is moved into bits 7 to 0 of the register D0 and the byte at 21 is moved into bits 7 to 0 of D1.

If memory location 20 holds two and location 21 holds three then, after the **MOVE.B** instruction, the register word of D0 (bits 0 to 15) are unchanged but the lower word contains 02.

```
bits 15 8 7 0
hexary 0000000000000000 1
```

If you want to get one byte you would use **MOVE.B** 20, D0. Similarly to fetch a longword you would use **MOVE.L** 20, D0. The first part of an instruction is called the operator (**MOVE**), says it by appending **D0** or **L** to the operator you tell the machine to handle bytes or longwords. **D** can be used for words, but this is the default since the 68000 is a 16-bit device.

To the right of the operator may be found one, two or no operands. Whenever there are two operands, as in **MOVE.B** 20, D0, they are separated by a comma and there is always an operating direction from left to right. So the **MOVE.B** 20, D0 a word is moved from 20 to D0.



Made every 27 and Amiga is a 68000 micro processor. This is the heart of the machine and is responsible for keeping an eye on the rest of the system. Assembly programming is all about communicating with this chip.



HISOFT DEVPAC ASSEMBLER ON COVER DISK

To write assembly programs you need an assembler. Without doubt the best package along these lines is HiSoft's Devpac. And guess what? You can use this month's cover disk you'll find the original Devpac. It's a complete assembler, debugger and linker. In short, it's all you need to create 68000 machine code.

All the information you need to use the system is included in the disk pages. You'll find a command summary on the disk itself. In the forthcoming months, Devpac will be used extensively. Why not start using it now? You can't do any damage to your computer.

To use the Devpac Assembler, double click on the GENOS (PG) icon (S) or type `run` given at the Amiga's CLI prompt. You will be presented with an editor. Assembly language may be typed in here and assembled from this editor. You're finished if we see you in the disk pages to see what to do next.

Check our special offer pages as you will find details on buying the Devpac instruction manual. Well worth it if you want to get the most from this superb system.



machine code is read, thereby pointing to the next instruction.

In order to record the outcome of arithmetic and logical operations, the 68000 provides a register known as the Condition Code Register (CCR) that sets the low order five bits of a byte as flags:

Z - Zero
C - Carry
N - Negative
O - Overflow

Each flag is just a single bit that is either 0 (false) or 1 (true).
C - Carry. This is set if an arithmetic operation needs, or generates, a carry.
O - Overflow. Set if an overflow occurs during an arithmetic operation.

Z - Zero. If the result of an operation is zero then this is set.
N - Sign. Is set if the result of an operation is negative.
X - Extend. This is the same as the C flag, but operates with only a limited number of instructions.

The condition flags are not usually used directly by the programmer, but instead their use is implied in instructions. For instance, BEQ label means jump to branch if the place in the program where label is located if the Z flag is set (equal).

Memory organization

Because there is a great many bytes of memory in computers, they have to be organized in an ordered fashion. Each byte is fixed at a definite location or address. Bytes may be found in the range 0 to 35771211. This gives 1MBytes. In practice there is much less memory available - 512K RAM for a 68000 and 800K Amiga - so many of the addresses are unoccupied.

Address registers are used to point to addresses in memory. It is important to remember that although the 68000 can read or write a single byte from that anywhere in memory it can only read or write words and longwords (at even boundaries from addresses).

Word size

The processor spends most of its time moving data and operating on data. In order to do this, it needs a store. The 68000 contains its own small chunk of memory called registers. There are eight data registers labeled D0 to D7 for holding data and eight address registers A0 to A7 for keeping track of where in main memory RAM or ROM it is possible to find large amounts of data.

All data and address registers are 32 bits long.

The 68000 remembers where it can find its next machine code instruction using a register called the Program Counter or PC. The PC is used to point to the next instruction. Instruction pointers might have been a better name for it. The PC is automatically incremented after each word of

LONG IN WORD

If you you should know lots from tables, bytes from words and longwords from doublewords if you feel like reading 68000 hardware then, or, very long words. But according to Motorola 68000 bits make a quadruple.

NAAGH! MINE'S FASTER

Clock circuitry synchronizes the data transfers between chips. In general higher clock rates are associated with faster computing. The ST has a 68000 clocked at 6MHz (eight million clock cycles per second) while the Amiga has a 68000 running at 7.125MHz. Hence, assembly language programs run 11.7% faster on the ST than on the Amiga. However, dedicated hardware in the Amiga provides faster graphics and sound processing.

HIGH AND LOW LEVEL LANGUAGES

Microprocessors are designed to read machine code instructions from memory and execute them. Assembly language is merely a notational device for machine code instructions giving the programmer controlled low level access to the hardware.

Languages such as Pascal, Fortran and C are referred to as high level since programs written in these languages need to be converted into machine code either by an interpreter - which does the conversion as the program runs - or by a compiler which produces machine code in a separate file to be run later. The high level language environment can be thought of as sitting on top of the low level machine code environment.

Writing in high level languages is generally held to be easier and quicker than writing in assembly language. So why not stick to a high level language like C? Simply because a compiler never produces very fast code and always produces long code. In translating the various high-level control constructs and data types under the constraints imposed by the degree of 'good structure', the compiler makes full use of registers and branch forwarding. You need only disassemble the 32 ROM (mainly compiled C) or the Amiga ROM (mainly compiled C and BCPL) to witness the utter gibberish produced by a compiler.

In its fast, high level languages do allow a high degree of portability from one type of machine to another, although hardware differences usually result in some rewrites.

In the extreme, Pascal should be reserved for Academic where people can worship the purity of perfect structure. Fortran can stay with crumbly old scientists who find their building is building substantial cards for batch processing. It will be used by first-book merchants who rely on sales to the 'computer-literate but technical no-hopers' in the business world, whereas assembly language is for the geeks with more time than sense who never meet deadlines and are proud of it. It is easy to write bad assembly language programs, but all the best programs are written in it.

PHOTOGRAPH BY GUY A. LAWRENCE



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OPERATING BETTER

It's here at last — version 1.3 of the Amiga's Workbench operating system. **BEN TAYLOR** turns a few tricks with the new features on offer, and also sneaks a preview of what's in store for ST owners with the forthcoming new TOS ROMs.

AMIGA

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The best thing we ever wish for, the best game, the best dinner for two, the best future, the Second Coming, the BBC finally using Bob's Hill House, and of course, AmigADOS 1.3. It was almost a year ago that Commodore officially announced a new version of the Amiga's operating system, and initial shipping date in the States was reported to be May 1989.

What's in a name?

The Enhancer pack contains three disks — KickStart 1.3, Workbench 1.3

and Extras 1.3. The Kickstart disk is for A1000 owners only — Amiga 4000 and A2000s don't need it, so they've got a free reusable disk.

Starting up Workbench 1.3 is exactly the same as using the current version, 1.2 — you turn on the machine and put the disk in. You won't notice much difference on the main icon-based display screen, except that you've got about 20K less of free RAM. In theory, this could cause problems with some programs which are extremely tight on memory, but so far all tested software we've tested seems to run perfectly.

If you're lucky enough to have a hard disk, you'll find access times dramatically faster — up to eight times in some cases. Unfortunately, floppy disk access don't get any benefit from the filing system changes.

If you never got the Amiga's GUI (graphical user interface), you won't notice much difference, if when you get to that launching "I" prompt that the whole deal changes.



PROGRAMMING

First impressions

The first thing you notice is that the icon you click on to launch a new GUI is called "Shell" rather than "GUI", and the prompt is `L:Amigados>1.3` instead of `I>`. Your current default directory and disk name are included as part of the prompt, to remind you where you are. If you see lots of sub-directories you may find your prompt gets to be longer than your command list.

The command line "history" is record of the last few commands is available, so if you make a typing mistake you can just press the spacebar key, edit the line, and press Return to try again. Beautiful.

Peak your printer

One of the major uses of improve-ment in 1.3 is the printer drivers. These little bundles control how fast and accurately your printer reproduces what's on the screen, and since each printer has its own characteristics you need to have a large number of drivers. There's no support for the HP Plotter and Inkjet printer, 28 pin Epson LQs and many more. Printing time for graphics screens is speeded up by three times in many cases.

The version 1.3 printer drivers have been widely tested with various commercial programs — anything which bought an art package in the last six months will probably already have them. If you've got PostScript and TrueType in your Preferences list then you're already got them.

One problem is that they can't run for the large number of

KICKSTART ON ROM

There are subtle changes to Kickstart in AmigADOS 1.3, hence the new disk that for A1000 owners, A800 and A2000 owners can buy new Kickstart ROMs for their machines, but you don't really need it. Without Kickstart 1.3, you can't leave from hard disk, but that's no great loss to most users. The Kickstart ROMs cost £14.99.

ROLLING BACK THE YEARS

If you're a new owner who bought your Amiga model at Christmas, you're being spoiled rotten by Workbench 1.3. You'd be surprised at just how much Amiga owners of yore had to put up with.

The first Amiga was the 4000, launched in late '85. The 4000 didn't have any ROMs, so before you could start Workbench you had to "burn" with a disk called Kickstart. The 4000 and A1000 have Kickstart in ROM, so nowadays you just put your Workbench disk in directly.

The version 1.0 Amiga operating system is remembered with a sigh, if the machine ran for five minutes without crashing it was a major achievement. Version 1.1 came followed, which was a little more robust, but still lacked a few features compared to version 1.2, which came on the scene in late '86. For instance, very few GUI commands allowed you to use wildcards, and the disk directory was fragmented over the whole disk. If you think that the Amiga shows are slow now, you should have seen them ten years ago!





Commodore AMIGA



printer drivers on the Workbench 1.3 disk. They are all on the Future disk and you need to run a special installation program to transfer the one you want to your local disk.

So, apart from command line history and new printer drivers, what's in Workbench 1.3? Although there isn't room for a comprehensive list of new features, here are the main ones with a few hints on what they're for:

RECOVERABLE RAM DISK - a RAM disk, as you know, is an area of memory which acts like a superfast disk drive. The standard RAM disk on Workbench 1.3 has two drawbacks: it eats up memory, and when the machine is reset the contents are lost. The only solution to the first problem is to buy more memory; the second one has now been addressed.

Type `SCRIP: SC00` at the CLI and the recoverable RAM disk is installed. Its disk icon won't appear until you size it, eg. `CLIP: SC01`. Unlike the standard RAM disk, it doesn't expand and contract as required - it's a fixed size. By default that's 256K, but you can reduce this by editing the amount for file as required. Incidentally, with all the other systems overloads the 256K default size leaves you with only 256K free on a standard 512K.

All files on the RAM device are now protected when you do a `Control-Page-Amiga` reset, or if there's a Gurus software crash. If you have Kickstart 1.3 ROMs you can arrange to boot Workbench from it.

AMAS - save yourself some typing by abbreviating those long AmigaDOS commands. You can use `AMAS` in any shell (CLI, Altan)

which you may or may not find useful allows you to turn the cursor into a tiny digital clock just by clicking on the Clock's icon. The time display only shows when you click on an area of a Workbench screen background, otherwise it's a conventional area.

ENV - *but you calculate!* Enter the new CLI command `ENV`. This can do simple arithmetic and bit operations. `Fand`, `tor`, `shift left`, `and`, `2 + 2 gives`, `um...` & so on. Curiously, you need spaces between all the items in an expression. You can specify numbers in decimal, hex, octal or as ASCII codes. Apart from the obvious applications, `ENV` can be used in scripts as a counter for loops.

ENVIRONMENT VARIABLES - communication between different levels on an Amiga has always been a bit tricky, and environment variables are a new way around this. One script file can create a global system variable for another application to read. You can pass directory names, sub-structure flags and so on around. The command `scriv: success` now in fact creates a file in the RAM disk called `SUCCESS` with the text `OK` in it.

ICONEX - an invaluable utility available in the public domain for some time that has finally gained the official seal of approval. `ICONEX` lets you attach an icon to a CLI script file. This means that you can make primary CLI-only programs available to users who are frightened of the good old 1- prompt; clicking an icon at the Workbench will open a dummy window and run the commands in your script file.

BEYOND AMIGADOS 1.3

Commodore make no pretence that Amigados 1.3 is the last word in the Amiga system software development. Indeed they are openly working on Workbench 1.4 as you read this (don't expect results this year though).

In Future's tentative opinion, there are four obvious areas with Amigados which need to be attended to in future:

- Floppy disk access times must be boosted up (Amigados 1.4 will improve this).
- Expanded ROM commands for simple functions are needed, to simplify operating system needs to load a program from disk before you can get a directory of that disk. For OS is ROM Commanded.
- Default icons: There should be an option to let you use all files at the Workbench screen, not just the ones with predefined icons.
- Task rotation: To make multi-tasking useful, when one task crashes the Amiga should be able to kill that task and recover. In the moment, every other active task crashes too.

RESIDENT - If you only have one disk drive you can find yourself involved in a lot of disk swapping as Amigados demands to use your fast disk to load even a simple command file DR. The new command `RESIDENT` provides a way around this requirement: it is, for instance, adds the DR permanently into memory. Of course, your free RAM decreases as a result!

Not all commands can be made resident. Programs have to be built, meaning well written so more than one task can use them at the same time. Most of the C directory system commands are pure, and you can actually force "impure" files to be made resident anyway by the command `RESIDENT` of `LIBRARY`.

SNIP BACK - a small but significant change in the `SNIP` command will revolutionise life for Amiga script programmers - at least you can `SNIP` to a label higher up in the file than your current position. `SNIP LABEL` will jump to label `[[SNIP]]`, searching from the top of the file.

Conclusions

Workbench 1.3 is a must for any serious Amiga owner. If you don't do anything more than disk games, disc in your machine then you probably won't need it, but for everybody else it's the best \$15 you'll spend.



■ Workbench 1.3 is full time. Note the recoverable RAM disk icon (bottom left) at the top-right, new Preferences icons and the altered CLI prompt showing your current logged disk and directory.

defined in one shell window don't apply to other ones. For example, if you regularly type the command `LIST DIR *P.DOC`, you can issue `ALIAS CLIP *LIST DIR *P.DOC` which means that typing `CLIP` afterwards lists out all DOC files.

GLITCHES - a cute novelty

To run a script file called `PERSE`, you would create an icon called `PERSE.GEM` it must be of the 'Pageit' type, like a Notepad file. Then you use the Workbench 'Info' option in the 'Workbench' menu to set the icon's default text to `C:\PERSE`. Double-click, and hey presto.

TOS 1.4 PREVIEW

Anything you can do I can do better... Not to be outdone by Commodore releasing a new version of Workbench, Atari are soon to let loose an updated set of ROMs for the ST. What's in store?

ST

There's one big difference between the ST and the Amiga: the ST runs all programs by ROM operations, whereas the Amiga has a command-line interface (CLI too, to be fair), there's not much you can do to reorganise the ST's system in which the only way to run a program is to position the mouse over and **Click** and double-click on it. Consequently, ST users shouldn't expect TOS v1.4 to be quite as revolutionary as Workbench 1.3 on the Amiga.

■ New File Selector

In any GUI application, when you need to open a file you are faced with a standard 'listing box' where you can select the file to be opened by clicking on a disk directory listing. On the current TOS, to get the directory of a

different disk drive you have to edit the path name to insert the new disk drive letter - on TOS 1.4 you can just click on the letter.

■ Recycle folders

The 'Close file' menu item lets you remove folders as well as files.

■ Less disk usage for copying

A more sophisticated Copy process makes better use of memory. On a single disk machine, if you copied a file from one disk to another by dragging it to drive B and following the copy prompts, one file could take 4 swaps, two files 8 swaps, and so on. In 1.4, copying several files in bulk will write them all to memory first (if there's enough) and then write them off to the new disk. Only one or two swaps should be needed at most.

■ File move

If you hold **Control** down while dragging files, they are moved rather than copied (the original version will be deleted).



■ Hard disk speed increased

If you have a fairly fast hard disk, but for control of the disk 'file allocation table' (the FAT) means you'll get the static speed increases. There's not much benefit for floppy disk users though.

■ IBM-DOS compatibility

Apart from a rather gimmicky ability to reformat the ST to the PC standard (Commodore's **Extend**) key board, the disk format has been altered to be the same as the IBM PC's 3.5" disks. All old ST disks will still be read normally.

■ Stop it!

In a good bit of user-friendliness, you can now interrupt long batches of file-copying or printing. Pressing **Esc** aborts any printing, copying, deleting or moving operations.

Should you go for ITT?

TOS v1.4 looks as though Atari have put a lot of hard work into it, and it definitely makes the ST more pleasant to use. The ST's TOS is built ROM, so unlike Amiga users who buy Workbench 1.3, ST operators will have to do some serious hard work hacking.

For the majority of users the changes are cosmetic, and don't warrant the risk of damaging your ST. You can get the equivalent of the new file requester by using the PD program **FSEL**, which was on Format SuperDisk 4.3. The most useful change is for single disk drive users, for whom the improved Copy function will drastically cut disk swapping.

INSIDE STORY

Although Commodore are entitled to brag, even our haven't managed to get hold of the version 1.4 ROMs due months early. This problem is linked to a pre-release version of TOS 1.4 distributed on a disk for developers. Its price for the final upgrade ROM kit has been announced, but we'd expect it to be £29.

TOS AND GEN?

ST users are often confused by the terms **GEN** and **TOS**.

GEN (Graphics Environment Manager) is the system of icons and windows that appears on your screen when you turn on your ST. It is a standard operating system designed by Digital Research for several computers, and therefore it doesn't change very much.

TOS (The Operating System), or 'Internal Operating System' as some people would have you believe is the lower level software which contains the general GUI functions into 386-specific machine code.

In theory, you never see TOS unless directly on a new version of TOS might speed the ST up but it shouldn't alter the look of GEN at all. In the case of TOS 1.4, many of the GEN shell boxes have been changed - presumably the legal reasons Atari can't describe it as a new version of GEN.



File requesters old and new - changing disk drives is much easier in the new version. With the old style the requester you must change the drive identifier by hand. With TOS 1.4 it's simply a matter of clicking on the desired drive icon. It's a pity Atari haven't gone further and provided all the standard found in today's file selector in their **FSEL** shell away on the latest 7 cover disk. Still, the 1.4 version is an improvement.



PROGRAMMING

TECH TOOLS

The ST and Amiga are powerful machines, and it takes a powerful lot of programming to get the most out of them. So you'll need the right tools for the job. Check out Craft 2, giving the ST programmer a Unix-like interface, and also a stunning new version of Lattice C on the Amiga.

ST

CRAFT 2

£99.95 ■ All STs ■
Commodore/HiSoft, The Old School, Greenfield, Bedford MK45 5DE (0525 71 37118)

CRAFTY CODE

Unless you were born with a silver spoon in your mouth, then it's likely that many of the terms in this review will leave you scratching. Consider no more.

What is a restriction that prevents you to see the output of one command as the input of the next?

Missing in a command line way of abbreviating when used commands and command responses.

Stream Editor is an editor for the processes a file taking its instructions from another file.

Clipping doesn't exist, but it presumably means kind of inserting.

Alternative work environments for the ST abound: there's Miro, reviewed last month; Mirage, OS9 and many others. Craft 2 is the latest addition - imagine a Unix C-shell running in 40 columns on a colour monitor! It gives you two powerful tools for text (one program: Development) Craft Shell and Craft Editor.

The Shell replaces Desktop with a command-line interface (CLI) similar to the Unix C shell. Features include 80 internal functions and keywords, programmable full script language, input/output redirection, saving, batch processing, on-board disk cache and printer spooler, files or GEMDOS pathnames compatibility, ability to run GEM and 2D external utilities.

Insider dealings

So what can you do with the system? The Shell is a command interpreter

that lets you execute instructions that are longer and more complex than those available from the GEM Desktop. You can access the ST's file systems more easily (once you've learnt the idiosyncratic command line instruction set, that is), redirect the input and output of programs and perform all manner of operations that simply aren't possible using a MMP system.

The Shell combines features

The keyboard commands take care of most of the basic editing functions such as insertion and deletion, cursor movements, and various other text manipulations. The command line is for executing more powerful commands or sequences of instructions.

Many options exist for personalising the Editor work environment. These are stored in a file which is automatically loaded when the Editor is loaded.

Up to 30 buffers are available for editing purposes and 10 'line buffers' which can remember up to 100 keystrokes each. There's also a 'fold' feature which works in a similar way to procedure packing found in C94 BASIC V3's editor, sections of the document can be hidden with just the procedure names showing. You have much more control in Craft's editor, however, as it is possible to determine which bits to fold.

Worth its weight?

It's worth getting Craft for the Editor alone. The same can be said for the Shell. Having the two together makes for a very powerful work environment.

It's not necessary to have used Unix before as the Craft manual is so good. Although there is the occasional odd turn of phrase and missing word, the manual does justice to its product. It's informative, contains clear instructions and is neatly indexed. Overall, then, a superb package that will appeal heavily only to a select few.

Richard Motters



found in the Unix C-shell, RMK? Unix Bourne shell, Unix Korn shell and the DCI interpreter - if you've come from a non-Unix machine background then you'll get to grips with Craft surprisingly quickly.

The Editor - which is set unlike the Proteus word processor - makes use of keyboard commands, the mouse and a command line which replaces the normal GEM menu bar.

CRAFT 2

For

- Excellent manual
- Powerful programming environment
- Easy runs on a 520
- Cheap way of getting experience using a Unix-like

against

- Limited audience due to price and nature of the product

features

1 2 3 4

performance

1 2 3 4

value of size

1 2 3 4

manuals

1 2 3 4

format value

1 2 3 4

ALL CHANGE IN VERSION 2

There's a 400 page manual to wade through which details an unbelievable number of updates to the original Craft. Here's a brief look at what's new.

- The shell used to expand the symbols, and - is the path to the current directory. That is, the full path of the current directory and the path of the parent of the current directory. This was done to help incompatibility between the GEM and Unix filesystems. Internal routines now make the difference inside.
- Input and output of all shell-commands may be redirected.
- Standard error channels can now be routed through a pipe.
- Shell variables could be any length in older versions. This is now cut back to 20 characters. The first character must be a letter; no such restriction is placed on the rest of the characters.
- Better related facilities. For instance, *pg will find shell.pg. This wasn't true in earlier versions.

AMIGA

LATTICE C v5

£241.50 ■ All Amigas, 1 MB recommended ■ Metacemco, 26 Portland Square, Bristol BS2 8RZ (0372 428783)

For the traditional Amiga programmer, writing in C always meant using Lattice C. More recently, with the likes of Meta-Atari C riding high in the popularity stakes, the choice of which system to buy is not so clear cut. This latest release promises a more integrated system much like C Compilers based on the PC - but Lattice find the morning combination off.

Discount rates

Every time Lattice releases an update, the disk count increases: version 3.0 came on two disks, version 4.0 jumped to four and this latest release comes on a hefty five. The first thing that will strike you about version 5 is the sheer professionalism of the whole product. Gone is the old spiral bound manual and is replaced with a sleek ring binder that contains between them, over 600 pages of solid information.

The most important part of the system is naturally the C compiler itself. The version 5 compiler is a much faster beast that produces leaner and more efficient code. Lattice claim speed increases of up to 12% over version 4.0.

One of the most major additions to version 5 is the inclusion of the Lattice Screen Editor (LSE), a fast and powerful text editor. Probably the best feature of LSE is the ability to compile your program from within edit. Then, if a compilation error is detected the editor jumps straight to the offending line. LSE will seem to many a real godsend as it can considerably decrease the amount of time taken to develop your software.

Probing the Guru

Version 5 also sees the release of what looks set to become one of the most used of all Amiga programming



Lattice debugger, CodeWise. In action, then, a program is being viewed in coded mode, as if on the assembler equivalent.

tools: the Lattice CodeWise. CodeWise is a source level debugger which boasts a remarkable similarity to the Meta 386 debugger released last year. If your program starts to do peculiar things when you run it, or crashes the machine all together, you can load it into CodeWise and observe the program as it slowly unravels away.

of the two. Being able to view a C statement with the assembler equivalent could be very useful when trying to optimize your code; it could also be a great asset when learning assembly. From within CodeWise, you can single step through your program and view at a glance the value of all identifiers and structures as well as your program's effect on the 68000's internal registers.

Linking Useful

Other new tools include a brand new version of BLK, the standard binary linker, and a very useful global code optimizer that is used to clean up your code by analyzing program control structures and searching out for 'dead' variables that are used once and perhaps never referred to again.

Lattice have managed to produce the first truly professional development system available to the general public. With version 5, Lattice seem set to do to the C compiler market what Metacemco have done to the assembler market with Omega 2. Certainly, there is a lot talking to touch this latest release.

Jason Hilliers



To use CodeWise, you must include full debugging information in your program by using the `-D` option when compiling. Loading a program in CodeWise compiled without this option will restrict you to viewing the assembler version of your program, much as what you would get from a disassembler.

You can choose to view the program being debugged either as C source code, assembler or a mixture

HISTORY LESSON

In the early days of the Amiga, any work in late 1985, software development tools were hard to obtain. The official development systems issued to software developers consisted of Amiga C, an assembler and various other tools. This official C compiler wasn't, as many thought, a Commodore product, but was in fact written by the American software company, Lattice Inc. Lattice C became the Amiga C development system just because there was nothing else out there - it was as simple as that.

LATTICE C v5

for

- Powerful screen editor
- Code optimizer included
- Powerful source level debugger
- Code is faster and leaner

against

- Compilation time is still relatively slow
- Hefty price rise from v4.0

BENCHMARK CORNER

Enough of all these fancy features. How well does version 5 perform compared to its predecessor, Lattice C version 4.0? We ran a couple of tests and came up with the following results.

	VERSION 5		VERSION 4.0	
	File size	Speed	File size	Speed
Simple Hello World	6.2K	-	7.4K	-
10000 Floating point operations	15.4K	29 secs	12.3K	27 secs
10000 Square root calls	17.4K	33 secs	14.9K	33 secs

features

1 2 3 4

performance

1 2 3 4

ease of use

1 2 3 4

manuals

1 2 3 4

format value

1 2 3 4

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TIPS

Disk boredom

Loading files from a softwaredisk can become a hazardous experience. Often, when you have saved and exited one program after another, the amount of time taken to find and load a file can be dramatically increased. Another side effect of poorly "softwared" files is occasional loss of data. By removing all your files, moving everything on the disk and then re-saving the whole lot, you can reduce the loading time by up to 40%. This causes massive access savings if the same procedure is applied to a hard disk.

John Wilson

Whitby, North Yorkshire

STOS

The Game Creator



Standing over STOS

The tip in February's issue of Personal Informer STOS owners like to make rudimentary copies of their adventure games. A far better method of achieving the important task is to first load up with your STOS Basic disk and then load STOSCOPY.AOB from your accessory disk. List the program and then edit the list: three lines go as follows:

```
120 Data 76715, 2141,
12079, 26149, 12010,
2060, 2364, 2164, 2650,
2241, 1446
```

130 Data

```
"BASIC.BSP", "BSP.BSP", "B1",
"ST.OS", "STOS.BSP", "B1", "B1", "B1"
```

```
140 Data "PROG.BSP",
"BBB.CB", "BBB.CB",
"AAA.CB", "AAA.CB",
"COBSP.BSP"
```

Now, list and reload, you're able

DESKTOP

When your favourite word processor starts sneering at you, or your mouse takes to biting your fingers, then it's time you came down to Desktop for all the latest tricks and tips. This month's winner is Rod Lavers from East Sussex for his autobooting information. £30 will be on its way to him just as soon as our master forger gets back from his hole.

AUTOBOOTING SOFTWARE

An autoboot program is one which will automatically set up a disk so you insert a disk that games operate in the manner because it's not of course most of default software games. When you insert a disk into your drive and re-load your computer, your loader if one exists and then straight to the AUTO folder (if one exists) and then straight to each program listed there in the order that they were placed on the disk. The best use of automatically executing your programs, it seems, is to move them into the folder. Unfortunately this doesn't always work.

Initiation routines

When you patch on your ST and insert a disk, a short initiation routine takes place. Your machine looks to see if an AUTO folder can be found. If found, the machine will move into this folder and execute any programs that it finds there and then call up GEM (the Graphics Environment Manager). This is where the computer will with autobooting systems. Any program which makes use of GEM commands cannot be loaded.

So what do you see?

There are three basic types of program file on the ST: there has extensions PRC, TOS and TYP. Of these, PRC programs are the only ones to make use of GEM. Hence, Power Book copies programs which contain GEM graphics commands as PRC files. Any non-GEM programs are compiled as TOS

files. And if a program contains the header 0000-BASES then it will end up as a TYP (TOS program parameter) file.

What you need to do is rename any program with a TOS extension and give it a PRC extension. Put this into the AUTO folder and load up. And for good measure, you'll find that it loads successfully.

Afterwards

There is one small point to bear in mind if you try executing a renamed TOS program at a later date (by double-clicking on it from the Desktop), then you'll probably find that it never

loaded a secondary cursor on the Desktop screen as soon as it has finished. It's not an easy job to get rid of this bug, but apart from spelling your screen dirty it doesn't seem to cause any harm at all.

Rod Lavers
Hasting, East Sussex.



Customiser and parser

First Word can be a daunting program to begin computer users. For those who have looked at the cursor and wondered how to get it to do that it doesn't appear as the cursor then here's the solution. Often customised people have tried to catch it

with the mouse and delete it which might be tedious exercise for protective games players, but it doesn't do much good when you're desperate to print a document. Forget about it for a moment and then a document is printed it won't appear with the rest of the text.

Alan Tugend
Tate, Bristol



1ST WORD PLUS

The Standard 1st Word Processor

Pieces of Protocol

If you use Amsoft's Protocol and would like to be able to subdivide a list of files you need to do is copy the main PROTECT.PRG program into an AUTO folder first if that exists. The resource files and auto-exec routines should stay in the root directory. The only problem which can occur is with the latest version of Protocol which gives you access to desktop accessories by

After the last part to load

```
CHOOSE, CHOOSE and save
SPRINT.AOB. Now you'll find that
when loaded as an autobooting, the
animation works perfectly with a
full memory bank of spaces.
```

John Hick.

Chard, Somerset

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Power Filter
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PACK 4

Power Pack
Power Supply
Power Switch
Power Transformer
Power Filter
Power Connector
Power Cable

PACK 5

Power Pack
Power Supply
Power Switch
Power Transformer
Power Filter
Power Connector
Power Cable

PACK 6

Power Pack
Power Supply
Power Switch
Power Transformer
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TIPS

Kickstart 1.3 tricks

If you're lucky enough to have Kickstart 1.3 installed in your machine or you Amiga owners have the official Kickstart 1.3



Installing the Amiga recoverable ram disk from the OS

disk, then this tip will be of great interest to you.

Does the loading speed of Workbench annoy you? It often seems to take an absolute age for Workbench to load. Wouldn't it therefore be nice for the Workbench to instantly load when the machine is rebooted. Well, if you're lucky enough to have a 1Mbyte expansion, it is possible.

Hidden away on the new Workbench disk, you'll find a listing in the mountlist for a new ram device. This ram device is in fact a powerful recoverable RAM disk that returns its contents even after reboot. If you have 1.3 Kickstart, you need only mount it once as the system will automatically call it each time you reboot. If on the other hand you're still using 1.2, then you'll have to mount it again everytime you reboot. A further advantage of using RAM under Kickstart 1.3 is that you can even have the machine boot from RAM disk - truly impressive!

To access RAM, you'll first have to drop down into the OS. Before you can start using RAM, it must first be mounted onto the system device lists using the mount command. This is achieved by typing enter: `mount`

WORKBENCH

Where can you find more tips than the Himalayas? Workbench of course! Within the next two pages you'll find a mass of handy hints to help you get the best from your Amiga. This month's lucky £30 winner is **BARRY WHITEHOUSE**.

RAD will install if you've got enough memory. If you haven't got Kickstart 1.3, you may have to format the RAD disk before it can be used. This is achieved using the mount program in your system drawer.

It just remains for you to visit the OS to copy the Load directory and the various commands required from the c: directory into RAD, and to create a startup

sequence for your new boot device. Before your machine will out a disk in the internal drive and after a few seconds control will be transferred to RAD.

Simon Griffiths
Knowledge

A real time saver
One very handy feature offered by the Amiga A1200 - and many of the RAD expansion cards available - is the inclusion of a battery

backed clock. Unless you've got plenty of disk, such a feature is a mere luxury and you are left with a system LOCK that dies every time the machine is switched off. Wouldn't it therefore be nice if the machine automatically asked you the time when you first boot Workbench? Yes, you've guessed it, you can.

Many AmigaDOS commands are templates that show you the

USING A CPC MONITOR WITH THE AMIGA

Handy stuff the old Amstrad hardware. Last month there was a tip on using the Amstrad IMP5000 printer with the Amiga and this month, if you upgraded from an Amstrad CPC computer, you can find out just how to link your old Amstrad colour monitor to the Amiga.

The Amiga has a real colour palette and therefore can all colour monitors are up to the job. Any monitor that accepts a linear video signal, such as the Amstrad monitor, should be able to cope.

To make your Amstrad-to-Amiga lead, you'll need to get your hands on a number of components. Firstly you'll need a 23-pin female D-type connector for the Amiga, a 4-pin DIN socket for the monitor and about a metre of heavy shielded cable. You may have

problems getting your hands on the 23-pin connector as this is a Commodore specific component. You can get by with a custom off 23-pin connector just cut off pins 13 and 25. The 23-pin socket are available from Tandy and other good electrical component specialists.

The wiring is fairly simple and only requires the soldering skills. Once the lead is complete, just plug in and go. Some older Amstrad monitors may require some internal tweaking by an experienced electrical engineer.

Barry Whitehouse
Mike's Keynote

AMIGA RGB VIDEO

- 3 _____
- 4 _____
- 5 _____
- 10 _____
- 20 _____

AMSTRAD CPC MONITOR

- RED _____ 1
- GREEN _____ 2
- BLUE _____ 3
- COMPOSITE SYNC _____ 4
- GROUND _____ 5

23-way D plug (rear view)



AMIGA RGB connector as viewed from the rear

AMSTRAD MONITOR SOCKET as viewed from the rear





FAME AND EVEN LOOT TO BOOT!

Do you fancy yourself as a bit of an Amiga programmer, and even an expert with the name? Are you the master of your database or a Probus with a good package? If so, why haven't you already shared your wealth of wisdom with other Amiga owners, you could pocket £20 for your trouble!

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terminal by using the command. These templates are usually called up when you enter a database mark (M) as the only parameter. This can be used to your advantage for getting a response from the user while a disk is loading. For example, if you enter 000 1, a template will pop up saying OK,OK,OK.

To use this tip, you'll have to load your StartUp-Sequence file

into a text editor and add the line, `code 1`. If you now save your StartUp-Sequence back again and then reboot, the Amiga will ask you for the time, (temp) but use `1`.

Getting along without an Amiga

Amiga mice are delicate little creatures, when one does not get onto its back and do, the machine

is left virtually unusable. OK, so you can use StarDigger 6, but what happens when you want to use the StarDigger? Before you started making this tip you would have been stuck!

It is possible to get along without the mouse using some very nifty keyboard shortcuts built into the Amiga. The first thing you will have to do is to press down on the right Amiga key and keep it

pressed down. You can now move the mouse pointer around using the cluster of cursor keys.

That's all very nice, but what about the mouse buttons? No problem, while keeping the right Amiga key depressed, press the left ALT key for the left mouse and the right ALT key for the right mouse button.

**David Pigg
Bath, Avon**

BEGINNERS CORNER

This month we continue where we left off last month with our look into the darker depths of the Amiga's Command Line interface. In this month's exciting installment, we'll take a look at how the Amiga disk filing system works.

Disk filing system

The Amiga disk filing system is essentially made up of volume, devices and directories. Although you're probably wondering what this has to do with the CLI, it is essential for you to understand these simple principles before delving too deep into more complicated areas.

Volume names

Contrary to what most non-Amiga owners will tell you, AmigaDOS is indeed a powerful beast. One example is the ability to name disks; nothing special in that (even the BBC allows you to do that), but AmigaDOS takes this one step further. AmigaDOS actually allows you to distinguish between disks by their names.

The only way of getting the user to insert a specific disk on other machines is to ask the user to physically insert the disk in a named device. If the user inserts the wrong disk, the program will very often continue dumbly and try to read the required file from that disk even though it is in the wrong disk. The Amiga, on the other hand, will prompt you to insert a disk of a particular name. If you insert the wrong disk, provided that the disk hasn't got the same name, the machine will reject it and redisplay the request.

Don't drive my device

How do I access the disk in the internal drive even though I don't know the volume name? This is often a problem new Amiga owners encounter; thankfully it can be overcome very easily by understanding



■ The best way of viewing a disk's structure is as a hierarchical chart. This chart shows you to see how each directory relates to the next.



■ Does the CLI bother you? Read *Beginners Corner* and you could end up talking about BCP, too (handles with the best of 'em)

how the Amiga handles devices.

When a disk is in a disk drive, the Amiga is able to access that disk through two routes: it can either refer to the floppy disk by its name as discussed above or it can directly access the disk by referring to the drive that the disk is inserted into. The latter is similar to the method used by machines such as the SI. The computer has no idea about the actual floppy disk itself, but instead refers to the disk drive forwards. This method may seem limited, but can often be very useful.

Directory dealings

In the darker days of home computing — when Commodore made disk drives such as the Apple (541) (yes, the apple last time) — the files on a floppy disk were all located in the same directory level. Disk operating systems have become more powerful since then. With the Amiga it is possible to group specific files into a number of sub-categories and store them in directories.

A disk containing files within directories is best viewed to a hierarchical chart. Every directory branches off from a parent directory or root directory of the disk. If you wished to gain access to a file called **BURROCK** — held in a directory called **OLLON** which in turn is contained in a directory called **BOB** — you would have to travel down through both directories before you could access that specific file. So, the file **BURROCK** is in directory **OLLON** which is in directory **BOB** which is in the root directory. This sounds complicated, but moving through directories soon becomes second nature.

As promised last month, next month's installment will see us actually starting to use those strange commands hidden within the Rubik's Cube C-directory. Hang in there...

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FORMAT LETTERS



"Dear Format, My computer doesn't understand me!" No problem is too small to baffle us as well, but at least you can sound off about it to thousands of

readers. Let off steam to: Format Letters, ST Amiga Format, 4 Queen Street, Bath BA1 1EJ - the best two each month win a lavish Format personal organiser!

Breathing space

Having recently purchased an Amiga 500 to further my BASIC programming, I'm at the least a bit confused with an Amiga 500. I have to admit that I believe the Amiga to be running an inferior BASIC to the CPC's.

My main reason for buying an Amiga was the increased memory available for my programs, after all 512K is fairly large, but alas I can only use 256K of this. My Amiga500 gives me 48K. On reach-

ing a stage well covered by Amiga2k version, I find the machine crashing up an 'Out of memory' error when only a few tasks had been completed. I turn to the clear command to save me by reinitialising a CLEAR command before running my program, but, however I am then faced with an 'Out of memory' error after setting up only two output windows for my program.

Not knowing where to turn, I apologise my programming and wish to you hoping you can help

me out of this mess. To me at this stage it seems that I would have been wiser to keep my Amiga2k than have the increased expenditure of purchasing an Amiga.

Please help me to recover my confidence in the Amiga's BASIC capabilities.

**Kevin Weaver
Workshop, Wells**

■ You're almost there, the CLEAR command is the one to use, the 'base' is the memory left for BASIC to use after you've reserved your program text area

I have just bought ST Amiga Format, having never seen it before - being as I do in school years - and am very impressed by and sympathetic with your letters!

I am a grandfather but have been used to computers since the prehistoric days of learning to program a computer that was used a whole building and didn't know as much as the ZX81. That was in the 1960's. My son programmed from the ZX81 to the Commodore 64, then to the 65 and I learned to program them, and even for a year acted as playtester for 550 in the USA. They'd had no money problems with shipping their games, even here and had no 'dead back' from the European Market - they found quite a few faults in their systems as a result, and that they seem to have learned from them!

In July I was hit by a small earthquake and my son was leaving home complete with 64 - what was I to do without a computer? After

Old time virtues

much research I bought the ST 520 FM Summer Pack, and several games and printer. I thought I was set now to do all I wanted - play games and write a book etc. But then my problems started. The ST is a marvelous machine and fits very nicely with it, and one very annoying complaint. Some games will not play, and after long draws out phone calls at great expense I have found out why. The games that won't play fit (Oregon monitor, King of the Shogunate and now almost all the clones) all have the same type of copy protection - they access a certain part of the disk.

No one will admit to it openly but apparently the fault lies in the computer's disk drive which is out of alignment. This is all - to

the fact that the demand for the Summer Pack was so great that Atari imported a lot of machines from Taiwan and sent them straight out without testing, so far as I can make out about a third of machines have the same problem.

When I inquired about having the disk drive realigned I was told by Silica Shop outlet to wait until it was out of warranty and have it realigned myself, buy a second disk drive or send it off and wait 2 to 3 months! Clearly that for after sales service! Surely testing a machine before it was sent out would be easier, quicker and cheaper than all this hassle!

**Mrs Ceilia M Taylor
Preston, Dyfed**

beach, or CLEAR command obviously isn't working enough. By lowering the 'base' down to its size at you really need.

Alternatively, by leaving more memory up to not loading Workbench, if you know how to do it, edit your Startup sequence file in the a directory to remove the line 'copywin' and not AmigaBASIC from the OS prompt. This should save you a good bit of memory.

Mandelbrot on the landscape

I would be grateful if you could help me with a couple of queries regarding my Amiga 5000 computer.

The first concerns the fractal scenery demonstration program included on the disk presented with the last January edition of your magazine. Usually, how is it done? I know that the Mandelbrot equation may come into the equation somewhere and perhaps this question may prompt you to write an article on this subject explaining, in not too technical terms, why and how the program works.

The other question concerns the analogue RGB output from my Amiga which I have used up till my TVRGB Monitor. When using the computer via the TV monitor for into the TV section I had control of the colour calibration as the colour control on the TV the second volume also was control

■ You aren't the only one to write to us regarding a sticky ST disk drive. It seems that Atari have installed many different models of drive in the STs over the years, presumably choosing around for the best price. Some drives seem more reliable than others. Officially, Atari don't know of any problems, except that some people by its an Summer Pack games (which are double sided disks) in older STs with single sided drives. They won't work, of course. Atari might get you try a disk cleaning or in case your heads are dirty.

Silica Shop also say that they handle such a large number of STs that a 2 to 3 week repair time is the best they can manage.





label. However, I have no control over colour as the RGB output from the TV colour control has no effect. (The same was found) with volume control but this problem has been overcome by wiring in a potentiometer between computer and monitor. Some colours in programs can be quite garish, and the ability to tone them down would be useful. The TV controls/brightness controls help, but I would be glad of any advice you could give.

**I Q Main
Aberdeen, Scotland**

■ This isn't the place for a lecture on fractal geometry - suffice to say that maths really can be beautiful, despite what you may have thought at school. We may run a short article on fractal patterns, revealing all its details.

As to your colour problem, there's no simple solution apart from using 'Preferences' to alter the palette of the Amiga. Or see a pair of spectacles.

Are you mad?

What on earth is going on down there? Everybody is screaming that Operation Wolf is stupid-perfect and you say it's slow and boring? What on earth did you get the courage to give Thunderbolt several 90's issues?? When you read the review you get the idea that it is a world class game. I think that Thunderbolt is almost appagable for in the double function latitude & speed of the fire buttons and very slow movement response. I don't know who to start to believe!

The top fault of most 16 bit games is that they rely on flashy graphics and sound levels, we are talking about 16 bit machines aren't we? But forget the playability - this title is producing more and more pain covered with lots of spin - Name games? Street Fighter, Ninja Challenge (to, to, to, to, to, to) and Thunderbolt. Nintendo Game is recovering from the same sickness with great games like Gearsman Wolf, Sam and the Perfect 100000.

I liked the review on the standard in issue 8, but who can afford to pay over £200 for a 386? I have a cheap (about £100) screen that you plug on a printer lead and which can cope with 150 Hz grey scale and 118 (most) Hz. It's cabinet free, and one info can be obtained at EMC, telephone 0161 4637746. Captain 14, 3887166, Capital 474024, The Netherlands

I have just bought a colour 1200 Printer, and so I need it set on OFprint. I drew a picture and clicked on Print in the menu. After about 30 seconds the print is started up, but all it printed was a series of numbers and letters. Is there something wrong with the printer, or my OFprint package? I got OFprint free with my computer in the manual for the printer it gives a program for the Amiga 500, so could you give me one.

**Scott Orchard
Bournemouth, Dorset**

■ You're probably not set your Amiga up to expect the correct printer. Once you've started up with your OFprint disk, set the Preferences program and select 'Epson' or 'Epson2' from the menu of printers. Now click on 'User' and OFprint should work fine. (This only need to run Preferences once, after that the changes will be permanent.)

I am the proud owner of an Atari ST 500FBI. I looked at your review on black and white printers, so I went out and bought a Citizen 1200. It works fine, but the Atari ST is allowed a maximum number of characters in a string.

When I type something into the computer I often use more than 255 characters so I have to start a new string, carrying on from where I left off the last string. Finally, when it comes out on paper, the strings containing my sentences aren't joined up.
eg:
10 GRENDE
"oooooooooooo....."
20 GRENDE "oooooooooooo....."
On the printer, instead of this:
oooooooooooooooooooo
4 comes out like this:

EMUC is a Dutch magazine for the ST, a bit more serious-minded than 'ST'. I think it's great value. I have no connections with EMUC in spite of the fact that I live only nine hours!

**Jay Lee
Capelle aan zee, The Netherlands**

■ Well, if everyone had the same opinion the world would be a lot sadder. Thanks for the info on the 32487 scanner.

Promises, promises

I had a strange thing the Commodore should not be suffer-

prints of darkness

oooooooooooo
oooooooooooo

Could you please give me a comment which will put us the things?

**A Alexandra
London**

■ Whether you're printing to screen or printer, the FORV

statement will always do a row line after it has printed it's message... unless you set a semi colon after it, which means, "Please Leave the cursor where it is 'm I've approx print some more" So, change the first line to read:

!! GRENDE"oooooooo....."
You should be OK now.



ing from the same shortage of RAM chips that affected all computers last year, especially so, at the time, they took so much trouble to highlight the responsibility of these companies in allowing themselves to be so badly affected I wonder if the same holds on the face of the People of Commodore how you have been deceived by worried friends?

The phenomenon isn't isolated to hardware manufacturers alone, it is also prevalent in software houses. I remember seeing an advert for Tomahawk, its Digital Integration, and then having to wait and wait a year for the game to be released. Many full price software appear months before the software, sometimes,

and accompanying them are order forms which lead readers to believe that the product is ready. Another recent example of this is FORV by Comix, advertised early last year and now only just available. The games in dozens of games by different software houses. Advertising a game that is far from completion is a guaranteed way to bring in the money.

I am an Amiga person, so my feelings are not purely based against Commodore. In my view they have produced, in the area, one of the best all round computers that money can buy, and in that respect I must thank them. The point of my letter is that I, along with many other computer owners, are sick to death with



As STs and Amigas replace the subject of weather for casual talk, what do you think will replace the ST and Amiga in the next century? Do you know how far the development of computers using light instead of electricity has progressed since the construction of logic gates?

I read an international journal on microprocessors that researched into a 64 bit processor is occurring - is this a hoax or will news? Will it mean looking rather sales as people try to use existing software?

false promises and fanciful announcements. It's about time they started to be a bit more honest with us all, and advertise products when they're really available.

Adam B '8101 awaiting the arrival of FORT
Marling
Luton, Leics.

■ It's the old two-weeks-waiter's-we're-just-waiting-for-the-manuals-to-be-printed syndrome. The vast cause of such disappointments isn't usually intent to defraud, but just poor communication between programmers and marketing men. Programmers are

Future perfect?

**J Fletcher
Trotteridge, Wiltshire**

■ Read Tals about big questions. The most recent innovation I've heard of is computer codes in the molecular music program. But later in the states have managed to make a switching circuit made of super-cells which is only a few

nanometres across. If these can be successfully combined, the use of microprocessors could drop by a hundred or thousand times, with a corresponding speed increase. Imagine Skyline 2 at that!

64 bit processors will undoubtedly come the Cray supercomputer already uses one. However, it's not how

many bits you have but what you do with them that counts - for example, the Amiga seems over 8 bit computers mainly due to the quality of its graphics and sound hardware.

If any readers have a market for these ideal machines of the future, we'd be interested to hear. Just because it's impossible don't let that stop your imagination! 

usually of unrealistic deadlines that they can't meet, and don't have the nerve to say they can't meet them and they're instead sorry (Mind you, that's exactly a lot like monthly magazines...)

Words of wisdom

I quite agree with D R Sanders on the problems involved with copy protecting software by the 'key word' method. One the last few months, I have purchased about seven programs, and six of these require certain numbers or words

to be typed in. I find it a real pain to keep all these manuals lying around, and I never bother to look up the disks anyway. Why don't software houses do the following:

Copy protect their software in the usual way - using 'key formats' on the disk - so that when the software loads it checks the disk and if it is correctly 'fused' the software works OK.

It, however, the check fails - because you've made a backup or you've got a virus - then the software should ask you to enter 'page 4, line 4, characters 57' or whatever. The software should

give you three chances to get it right. If you're entered a number zero should be used in case the person is a bad typed a letter.

If this failed they could then put the software in a 'demo mode', taking out the user but giving them an idea what they are missing.

By the way, I think the Commodore should get some sort of award for their protection method in Pro Mod Plus - it always asks for the same word to be typed in.

While I am having my say here is a quick message to Commodore.

I have two main questions to ask you:

1. What is a RAM disk?
2. I have an Atari 520S (RAM) and will be upgrading it to a Mega 2 before next year and I know quite a lot of BASIC and I can honestly say that I'm good at it. However, since reading the article in issue 8, on Steve Bink, I would like to take up machine-code programming. Therefore, what is the best computer that I can buy for under £15? I have never ever used machine-code, and know absolutely nothing about it, so I need a good clear manual.

Congratulations on a really superb magazine. I get it every month however the one online that I have is the amount of typing errors that occur. I managed to count 26 in issue 8, and 37 in issue 4, without searching for them!

Please could I also comment on the superb customer support offered by Computer Concepts. I needed help with Amiga BASIC and they were totally superb!

**B A Howard
Stammore, Middlesex**

■ A RAM disk is simply an area of a computer's memory which

Going Bakwards

is set aside so you can store files in it, just like a disk drive. Because it is memory rather than a physical disk drive with a motor to be turned on and off, file access time is very fast. However, all files are lost when you turn the machine off.

The best machine code development system I know about (RGOS Devpac 2 at £50.95 version 1 is on this month's cover disk).

We do not make news spelling mistakes, money. Not many, anyway. You'll be relieved to know we have a new production editor starting next month, so things should get a lot better!

After using Sinclair Spectrum mikes for many years I recently tried the 128K version plus. Despite disk interface I have recently bought an Atari ST system, and I have a few questions:

1. My Spectrum wordprocessor is Timesed 2, and I have many files stored on disk. They can

only be converted into ASCII data files, but can they be transferred to an ST wordprocessor, such as 1st Word, via the RS232 ports of the two micros? If so, how is it done?

2. In issue 5, Steve Bink writes that he uses a Mega ST to split files, via the RS232 ports, into a 520 ST. Could you please explain what this means, why it is done, and how it is achieved?

3. Finally, to satisfy your obsession with column facts about animals, have you realised that you can turn them into a word robot?

**Philip Ryland
Horned Hempstead,
Herts**

■ Well, I don't know anything about the Spectrum but if it's got an RS232 port then there's no problem. You will need a Spectrum program to send text to the serial port and an ST program to capture incoming text and save it to a file. Then you

need to get a serial test cable sure the person who makes it for you knows it is for the transfer - serial cables for printers are wired differently and won't work!

Once you've transferred the text, virtually all ST word processors can read ASCII files.

As for Steve Bink splitting files from Mega ST's to 520's it just means using a camera lens to transfer data. And no, I can't think of any good reasons why he doesn't just swap disks.



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We want to be able to make tasks, not just make them

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Garvin James

Ashted, Surrey

■ I think your software is a bit too complex - printers are getting pretty good at copying even weird disk formats, so you aren't addressing the real problem.

And, paid for your software for the Amiga made rock solid sense. Roll on Workbench 1.4, and let's hope Commodore are reading this.

Automatic lover

This is a cry for help from an absolute beginner!

I have stubbornly absorbed the contents of the ST Amiga Format since it first hit the scene - there's dedication for you! - particularly the letters section and the Desktop version looking for a way to make the AUTO folder work on my 2080.

In spite of following the advice given, its besetted! What am I doing wrong? Or what does every-

Disastrous jokes

I have two grievances from issue 8 on page 62. You refer to Clapham Junction and try to make a fatness joke out of it. On the same note, on page 66 you make another fatness joke about Aramis, to come after the earthquake took place. I was disgusted. I hope you do not print any other cracks like these. You had better print this letter or otherwise it's proof that you do

not take any for criticism and only print letters which praise you.

Rahim Chibhga
Harrow, London

■ Sorry for any offence caused... all our jokes are meant to be taken with a pinch of salt. The man responsible has been taken out and had his head stapled to a lamp post.



body know that I don't?

Look at issue 4 page 89. Beginner's Corner, and page AUTO FOLDERS. Not for me! I have followed the directions exactly but it doesn't auto load. I have tried putting a FPO on the Auto folder name - still no go. Help, please.

I would appreciate any instructions in easy to follow steps and it would be no more than one and a half syllables.

Bill White
Worthing, West Sussex

■ It's really dead easy: to make up a disk which automatically runs a program, the first thing

you need to do is create a mini-loader called AUTO. Most most ST programs have libraries that read with -FPO. Suppose you want to autoboot ST BENCH - just drag the file BENCH.FPO into the AUTO folder, rename the machine and everything should go swimmingly. The only possible problem is if it is a big program which needs to get some other files - just make sure every file you need is in the AUTO folder.

Decent cover

ST Amiga Format is without doubt breaking new ground in its innovative approach to the Amiga and ST. It is a pain in the neck to only get 12 50 or more for a monthly or bi-monthly magazine which as far as programming is concerned, only provides text and listings in C, Assembly or Pascalish. The CoverDisk idea is brilliant and compared with the expense involved in other ways of getting PD and Shareware, such as Modems with calls and phone bills to pay, it's a bargain.

The Fractal Systems program was worth the price on its own. Some of the games are so brilliant and readable the Commodore coastline. I have named two scenes: 'Mullon' (love) and 'Eggnog'. And as FT files they can be easily loaded into CoverDisk 2 and worked on in my host's content.

John Gray
Eastbourne, Sussex

Roll back the years

I would like to take advantage of your voucher scheme but unfortunately I can't travel back in time or 1986. Look at it a reverse side of the voucher and see. It states they must be received by

February 28 1988 - dated **Andy Van-Korvo**
Huntingdon, Cambs.

■ Watch out for the next month's cover-mounted T-shirt...

Tick, tock

Could you please help me, Please, please, please tell me if there is anything wrong with my computer. When I switch it on the disk drive it makes a noise every two seconds. The gears on until I put a disk in. This has been going on since I bought it.

I bought it about six months ago from Slicks shop. They sent me the US model, and I am not sure about the resolution. I read in some magazine about a big hole gap at the bottom of the cover (55 pixels) that the US model got higher resolution than the US model. It so call Slicks shop changed it for the UK model!

Earle Ahmed
Newcastle upon Tyne

■ Although you don't see, might I hazard a guess that you're not an Amiga? The ticking noise is just the computer checking its disk drive to see if anything is there... it's an annoying habit and one that will stop if you put a disk in. In the constant disk checking prevents you from doing anything.

There's no real difference between US and UK Amiga (apart from one or two keys if different placed). However because the two countries use different television standards (ie have PAL, they have NTSC) the software only uses 200 lines in the Amiga's display. Unless software uses 256 lines, it tries all of the screen to fill in the country of origin of a piece of software, not hardware, and determines the screen size.

Purple rage

I felt I had to write following the year February 1987 issue.

Like most of the purchasers I suspect, I was expecting a real to good demo of Purple Saturn Day. Well, how disappointed I was.



WANT ALL YOU WANKING? BY GLEN BRETT AND THERE'S NO HOLDING BACK!

Consisting of some crummy screens in the form of a slideshow, and repetitive music, this has to have been the worst demo for a game I have ever seen. If I have hope to sell many games on the strength of this demo, I think they are in for a real wankering.

As for yourselves, I am very disappointed in you for using this piece of inferior material as the main event on the CoverDisk. I hope that in future you are able to ensure that a truly worthwhile demo is deserving of the honour of headlining the CoverDisk.

Stuart Hunter
Edinburgh, Scotland

■ We normally try to make sure that our demos have a playable level to them, but unfortunately couldn't manage it for this one. Still, it's an excellent game and we can heartily recommend it.

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ESCAPE SEQUENCE

SCANNING SUCCESS

Judging from the 2,008 entries for your 8th Cameron Scanner competition, there's a loads of you who want to digitize photos of your loved ones and teach them up (or, like, the protocol).

Your mission, you'll recall, was to scan five differences between two pics of Agnes in the office armchair. In the second pic, Agnes is sticking out her tongue; she's got a third

size on her front foot; a shaded hat, a fly on her left, and her laptop reads "kissed me" instead.

The first two eagle-eyed readers out of the hat were Amiga owner M. W.S. Corigan of Little Billing, Northampton, and Steve Jonathan King of Spring Park, Northampton. O.K., didn't you spot one to "fill extracts must live in Northampton"?

Thanks to you all for entering, and to Corigan for the prizes.

MANUFACTURING UP

Format is, of course, not together by an organized team of cool, calm professionals who never panic. And the Pro's my grandfather.

This month's cover disk certainly boosted the various sales of both channels. US Sales agreed to run a demo of LaserJet's 2400 Workcenter, and the disk deadline came and went without any dramatic wringing. "Oh, didn't see any it was

NEXT MONTH

The magnificent May issue of *ST Amiga Personal* marches onto the shelves on **Thursday 20th April**. And we've already got a mass miscellany of material on the menu. As well as all the usual suspects regarding the machine code and emulation libraries, if all goes according to plan there'll be:

- **DISK SCHEDULE** - Do you suffer from sticky T5 displays? At last, the definitive guide to better T5 and Amiga vision, from video modding to 3D resolutions.
- **THE BODING TROUBLE** - Build your own sound computer for around £200 in a couple of quick weeks with all the software.
- **POWER UP! UP! UP!** - Yes, a 3.5in floppy disk can save again: can anyone point it out off *Proton Part 2*?
- **CD, 3D!** - Graphics isn't just pretty pixels, you know, it took all the world of Computer Aided Design, and a review of Professional Draw in the Amiga.
- **TOP GAMES** - Board Games and Blood Money lay the May charts. The search for the world's games heaven is here.

coming from the States? Well, you what, we'll have it modernized across to save time? A success? Over the Atlantic with more cracks than a bag of post scratches? "Sure, an always do it," they said.

As rings LaserJet in the States

to confirm things, and asked how they coped with error detection on a modern. "Gas, I damn. We will never do it before," he.

So if there are any pitches in the arena, a tabloid noted the whole line at the wrong moment.

by Sarkis

Superheroes, Inc.



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