

# AMIGA USER

## INTERNATIONAL

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MAY 1991

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AUI's Exclusive  
Amiga Rodent  
Round-Up

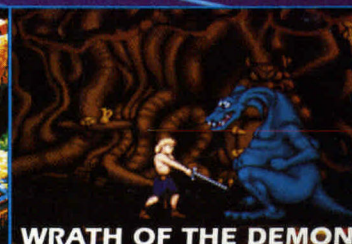
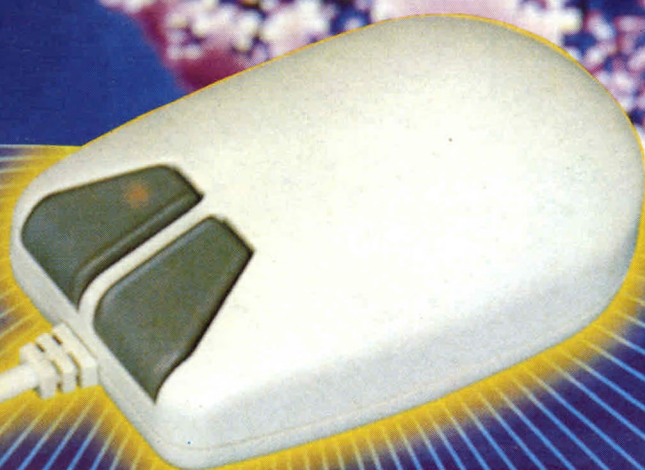
**Hot Report . . .**  
New York's Amiga Show  
The Latest Graphical  
Software . . . Draw 4D and  
Disney's Animation Studio  
Fractals and Chaos . . .  
Create Your Own

**Special Reviews . . .**  
Dynacadd,  
IVS Trumpcard and  
the Cameron Scanner



### Top Amigames

Genghis Khan . . BRAT . .  
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## THE GENLOCK PEOPLE

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*Amiga Format magazine review,  
February 1990.*

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**Marcam's FrameGrabber is the answer to every Amiga owner's digitising dreams.  
Marcam's unit currently represents the ultimate in Amiga video digitising.**

*Amiga Computing - October 1990*

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RENDALE 8806

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### 3D PROFESSIONAL

3D Pro represents the state of the art in Amiga rendering packages. The program is initially daunting, but once you've got the hang of it you'll be churning out complex ray trace images in no time.

Highly recommended - *Amiga Computing October 1990*

Powerful polygonal rendering techniques allow you to create stunning 3 dimensional images and animations quickly and easily. 3-D Professional combines power and performance with an intuitive interface that gives the Amiga user complete control of the entire object rendering and animation process. Use the mouse to manipulate every aspect of an object: size, rotation, surface lighting, colour, etc. 3-D Professional then lets you choose between several advanced rendering techniques for displaying your objects in spectacular 3-D form! Also, create impressive backgrounds with fractal landscapes, trees and clouds.

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**PRICE  
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# MASTER S.O.U.N.D

Sound sampling Hardware and SOFTWARE for the AMIGA

## WHAT IS MASTER SOUND?

MASTER SOUND is a low cost, high quality sound sampler for the AMIGA range of computers featuring advanced Sampling/Editing/Sequencing software. MASTER SOUND enables you to record sounds from devices such as Personal Cassette or Compact Disc players into the AMIGA. When in the Computer, MASTER SOUND'S unique editor will enable you to edit the sound in practically any way you can imagine. Once you have the sample how you want it, you may incorporate it into your own Demo's or programs or use MASTER SOUND'S own BUILT IN sample sequencer to play back the sample along with a number of others too!

## THE MASTER SOUND EDITOR

incorporates the following facilities:

- |           |            |              |              |
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| ★ CUT     | ★ COPY     | ★ OVERLAY    | ★ WIPE       |
| ★ FADE IN | ★ FADE OUT | ★ VOLUME     | ★ REVERSE    |
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Allows you to play back samples in a sequence. Multiple samples can be held in memory at once and sequences are as simple to record as tapping keys on the computer's keyboard. Once recorded, the Sequencer can save the samples and sequence file out onto disc so that the files can be used in your own demo's.

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Allows you to play back your own sequenced sounds from the sequencer while displaying IFF picture files. This is great for creating your own public domain demo discs without having to be a computer programmer!



MASTER SOUND EDITOR



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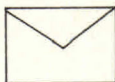
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# AMIGA USER

## INTERNATIONAL

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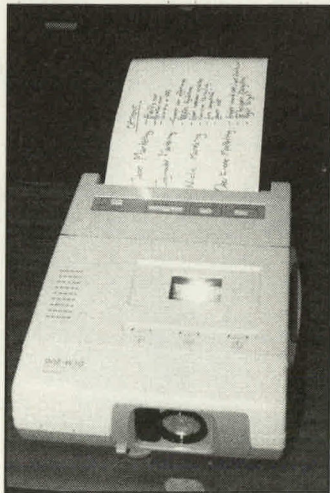
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# THE WORLDS FIRST CAMCOPIER

The world has only just taken on board the idea of the camcorder, and now Chinon have introduced the world's first Camcopier. It is like a camera but gives you photocopies of whatever you point it at..... whiteboard, blackboard, flipcharts, posters or people, the new Chinon Portable Image Copier will give you an A4 size photocopy of anything, any place or anybody, at the touch of a button. You can now photocopy 3D objects for the first time and you can choose whether you want your copy as a half-tone, positive or negative image.



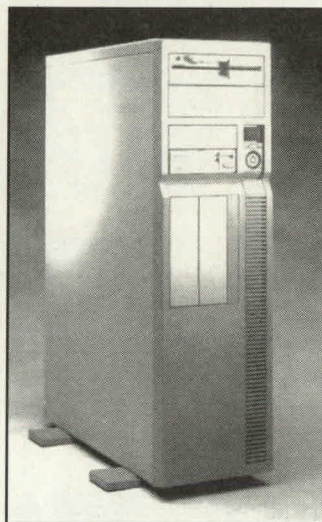
The Camcorder is the size of a portable typewriter. Its applications, say ECB who distribute it in the UK, are many: training, education, management, design and engineering etc.

Using the Camcorder is simple. You select whether you want a half-tone, positive or negative image of your subject.

Then you look in the view finder, frame your subject the way you want it, press the button and the A4 picture is delivered in less than 30 seconds.

**Contact: ECB (Electronic Copierboard) Ltd., Regal House, London Road, Twickenham, Middlesex TW1 3QS.**

# COMMODORE'S UNIX WORKSTATION



Commodore has finally launched its first Unix-based amiga running AT&T's Unix version V.4. Previewed at Business Computing 90, the Amiga 3000UX is a powered version of the A3000. It was held back until Unix V.4 was available in large volume.

The binary compatibility enables applications written for other workstations to be run on the Commodore hardware. The user interface is based on Sun's Open Look GUI, developed initially for Sun, IBM, DEC and HP workstations. CBM regards it as a low-end workstation and will sell it mainly on price performance. At Business Computing 90 CBM showed the prototype as a graphics workstation.

The price will be around £3000 which could make it very competitive as its main rivals are priced at around £5000.

# MIRRORSOFT'S MIRROR IMAGE

Mirrorsoft is launching a new, retrospective (Mirror Image ! - Geddit? ) label named Mirror Image.

Mirror Image will re-release 16 Bit products from Mirrorsoft's different labels. In addition, good quality games from other software houses will be re-released.

The first four games to be launched on the new label will be old favourite Defender of the Crown, Oskar-winner Rocket Ranger, Speedball, and Carrier Command. Two releases per month are scheduled.

Mirrorsoft says Mirror Image will introduce new 16 Bit computer users to the classic programs of the past while allowing more experienced users to purchase programs they may have missed first time round.

Included in the first batch of releases is DEFENDER OF THE CROWN - this classic program from Cinemaware showed the games industry just what the capabilities of 16 Bit machines were. To quote the MD of CBM at the time - "It sold more Amigas than anything else". Its graphic and sound effects astounded both press and public alike and established Cinemaware in the European market place. Its blend of strategy and arcade action has more than stood the test of time, say Mirrorsoft.

The price of Defender of the Crown and other Mirror Image games will be £9.99. Well worth the money we would say just to know how it felt to play the first big game on the Amiga...

# GIGABIT CHIPS

According to Toshiba, dynamic memory chips will continue quadrupling capacity every two or three years for the foreseeable future.

Michael Edwards, Toshiba's memory marketing manager, recently commented "I expect to see 1Gbit D-Ram chips by the end of the 90's".

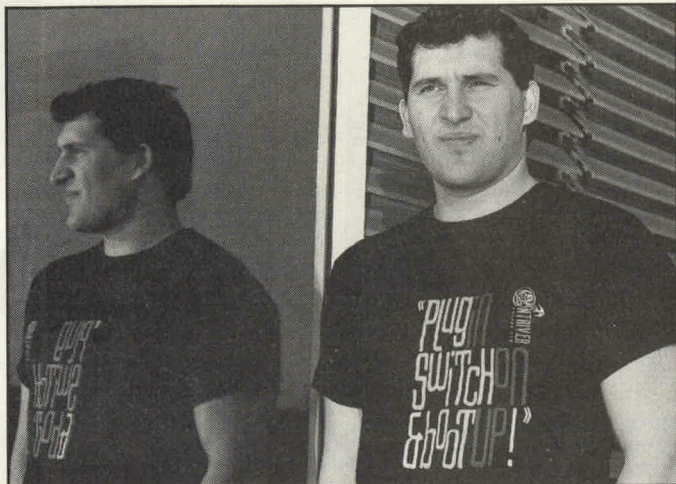
Hitachi too has announced that it is aiming for a 1Gbit chip by the year 2000 - a sub 0.1

micron processor with a performance rating of 1Gbps and transmission rates of 40Gbps. But before that, both Hitachi and Toshiba, which currently lead the market in 4Mbit D-Ram chips, will be competing to be the first 16Mbit chips. Both have pre-production 16Mbit D-Ram chips, but neither is in a position to begin volume production before the end of the year.





# PLUG IN, SWITCH ON AND BOOT UP!



Caption: The Plug Ugly - sorry Plug In - Contriver T Shirt.

**If you buy the Contriver 5 in 1 and Multi DPI mouse you can currently get a free Contriver T shirt too.**

The T shirt, which is engraved with the immortal legend "plug in, switch on and boot up" is available free despite the fact that the mice retail for, what Contriver calls "an insignificant £29.99".

One thing is for sure, Contriver say once the computer has been switched on, operating the Contriver mouse will be an extremely user friendly task, even more friendly in fact than Contriver are being in giving away the T shirt. (Well, they would say that wouldn't they?).

The Contriver Multi-DPI Mouse offers a variable resolution of 100 to 800 dpi. A changeable resolution can be useful for the Mouse becomes suited to work requiring close detail such as the design or graphics where 100 dpi would be appropriate, and the opposite extreme where speed is all

important and 800 dpi is important.

The Contriver Five in One Mouse is, claim Contriver, unique because although it is common for serial mice to be compatible with many computers, the Contriver Five in One is a bus mouse. Many computer owners prefer to use a serial port for other peripherals and so have a preference for the bus mouse. Those with 2 or more computers from the 5 compatible machines will find the Contriver Five in One Mouse a particularly tempting product. It runs with the Schneider PC, the Amstrad PC, the Commodore PC/30 series, the Atari ST and the Commodore Amiga.

**Contact Contriver :**  
**Unit 3 Buckingham Industrial Park, Buckingham, MK18 1UH.**  
**Tel 0280 822803**

# GOLD DISK MEDIASHOW

Gold Disk has announced MediaShow, a multimedia sequencer for creating presentations and desktop video productions of all kinds, quickly and easily, especially on the Amiga 500.

"Mediashow can turn the Amiga 500 into the ultimate movie making machine," said Kailish Ambani, president of the Toronto-based software developer. "The easy to use timeline interface, and our patented multitasking engine, makes creating long running presentations and movies a reality for every level of Amiga user."

MediaShow is a multimedia sequencer that allows the user to harness the Amiga's power to combine and play animations, graphics, music, and sound effects. MediaShow automatically loads upcoming segments of the movie from disk while the movie is playing. This allows for long running, continuous playing animations without waiting for disk loads.

To aid in the creation of movies, MediaShow features a built-in video titler that can overlay text on top of movies with special effects such as multi-coloured extrusions, shadows and outlines. And a wide variety of built-in wipes, fades, transitions, and dissolves to give the presentations or movies a profes-

sional look and feel, say Gold Disk.

MediaShow's unique timeline user interface makes creating movies accessible to all levels of users, requiring no complex codes to remember and no programming. MediaShow supports files from most paint programs, 3-D rendering and animation programs, music programs, and sound digitizers/editors. No additional hardware is required.

MediaShow's presentation, education and entertainment applications are, say Gold Disk, virtually unlimited. And it makes long running presentations or movies available to anyone with an Amiga 500 and 1MB of memory.

Due out in Spring 1991, MediaShow retails for £129.95 and will run on any Commodore Amiga 500, 1000, 2000, 2500 or 3000 with at least 1MB of RAM and is Workbench 2.0 compatible. A hard disk is recommended, but not required.

**Contact: Gold Disk, 5155 Spectrum Way, unit 5, Mississauga, Ontario, Canada, L4W 5A1. Tel: 416 602-4000.**

## Quote of the Month

***"The main difference between a home computer and a console is that a computer has to be sold, the console sells itself."***

*Tim Chaney, MD Tecmagik.*

Ah, yes, that may well be true - for now and for the mindless games addicts. But what happens when the two devices get confused? A Miami, Florida company is launching a series of cartridges for the Nintendo Gameboy console that provide it with a spellchecker, dictionary, thesaurus and an organiser. Serious stuff... Mindscape too have a music instruction pack for consoles. Will these more intelligent add-ons make it harder for the consoles to sell themselves? With any luck, a lot harder...

## PEN PUTTING SYSTEMS

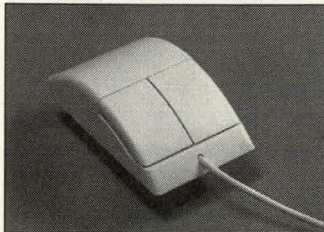
Cheshire-based Eden has launched a pen-input system for computers which the company claims is the first to be designed and produced in the UK.

Papertalk consists of an A4-sized pad, one inch thick and weighing four pounds, with VGA screen and an attached electronic pencil. It can store 200 pages of messages.

In addition to proprietary software, Papertalk supports Dos applications and the rapidly emerging write-on-screen operating environments.



## PANDAAL'S MOUSE



**Pandaal have announced the launch of DAATAmouse for the Amiga.**

This new design has a slider switch located underneath which is used to choose between Atari and Amiga operation.

The high resolution 280 dpi DAATAmouse is "a superb feeling silky smooth mouse!" (Silky smooth? Very sexy!) claim Pandaal.

The mouse features two microswitched buttons with a lifetime of 1 million cycles, which Pandaal say, ensures a light and positive click.

The anti-static extra lightweight ball runs smoothly on most surfaces and can be removed for periodic cleaning. (You know, mouse droppings...)

Pandaal believe that the DAATAmouse is the fastest mouse in its class and will operate in a very small desktop area.

**Price: £39.99.**

**Contact: Pandaal Marketing Ltd, 44 Singer Way, Woburn RD Ind. Estate, Kempston, Bedford MK42 7AF. Tel: 0234 855666**

# A KILLER OF A JOB ?

**What causes people who work on secret projects to kill themselves so often and by such strange ways, is a mystery yet to be solved. It can't do much for Marconi's recruitment though...**

Over the past seven years, no less than 25 computing or electronics scientists working at Marconi, the electronics defence contractors, have died in mysterious circumstances. The cases, many involving those working on top-secret torpedo projects, have been typified by the apparent suicide of the victims in bizarre circumstances.

The latest, Graham Puddy, 44, followed the earlier eccentric pattern. A quality control engineer at Marconi's underwater systems division at Addlestone, he was discovered just before Christmas drowned in a canal, weighed down by a painter's trestle. (Which is a very odd way to choose to die, don't you think? Would you use a painter's trestle - whatever that may be - to weigh you down?)

At the inquest, his wife Dorothy said he had asked to see his bosses at Marconi to discuss something of a highly classified nature. She told the inquest: "He was visibly excited about an invention he had been working on for several years."

A few days before he disappeared, Puddy, who had worked for Marconi for 23

years, burned everything to do with the mystery invention and then erased data on his computer disk. His death came the day before he was due to meet Marconi about his invention, which he wanted to patent.

After his death, the invention was submitted to the Patent Office for evaluation. According to police evidence at the inquest, the Patent Office said the invention would not have worked. Curiouser and curiouser...

## 25 Deaths

It seems strange that there should be such a mysterious series of deaths - 25 oddly coincidental and generally peculiarly achieved deaths - that have taken place connected with people employed at Marconi, a company who have, by the way, been recently accused of allegedly pirating software for use in their office. The moral of the story so far, certainly seems, if you work for Marconi, not to ask for an interview with your bosses. a long distance application for redundancy might be a better option - and stay away from painter's trestles...

## NEW CLIPART LIBRARY

The Digigraphic library contains Amiga IFF clipart in 8 colour medium resolution. Each disk contains clipart for a particular subject and can be bought separately, or buyers can make substantial savings by purchasing the whole library. All graphics are original and have taken a four man graphic design team over a year to develop. Every disk is 85-100% full.

Categories include: Travel; Sport; Estate Agents; Department Stores; Hardware Stores; Art Pack; Science; Office; Transport; Electrical; Footware; Business; Map Pack; Confectionary; Fashion; Finance & Insurance; Grocers; Hairstylists; Pharmacy; Hotels; Public Houses; Chemicals; Backdrops 1; General 1.

Digigraphic will be expanding the media library to include more clipart and a library of sound effects in the near future.

**Contact: Digigraphic Ltd., 1 The Terrace, High Street, Lutterworth, Leicestershire, LE17 6BA.**

**Price: £14.95 Per Disk or £199 the Complete Library.**



# ACCOLADE'S PASSION WAGON

**Accolade is launching a new add-on disk that combines both erotic (sorry exotic) cars and scenery for use with Test Drive III : The Passion, (They named it after Accolade's Nadia Singh's own very sporting vehicle).**

The addition of the two hottest new sports cars on the market - the new Acura NSX and the Dodge Stealth R/T Turbo (we haven't seen that one toddling down Totteridge Lane yet) - in-

creases the number of state-of-the-art cars in the Test Drive III showroom to five.

Road and Track magazine called the Acura the best sports/GT car over \$50,000 - better than any Ferrari, Lotus or Porsche at any price. (Tony Horgan has two!) Accolade says that "The technical esoterica" (Do you mean erotica, Nadia?) of the Dodge Stealth, on the other hand, is only comparable to that of the Porsche 959."

(Well, of course, you knew that didn't you?)

The actual dashboards of the cars are digitised onscreen and the speed and handling characteristics are faithfully reproduced. And not only can they be driven on the Pacific coastal roads contained within Test Drive III, but for more fun they can be raced on the five distinctive roadscapes of New England.

(New England in the Fall, we

like that, it's beautiful!).

Combining Autumn colours and fast challenging roads, Road and Car 1 will take you from Cape Cod to Providence to Hartford; from Albany to Syracuse to Niagara Falls. (And into it if you aren't careful!) There are tour buses, buzzing airplanes, hot air balloons, bridges, water wheels and ferries to distract the driver on the way. (All it lacks is Nadia's hand on your knee!)



# ANNOUNCING THE A5000 AND B5000

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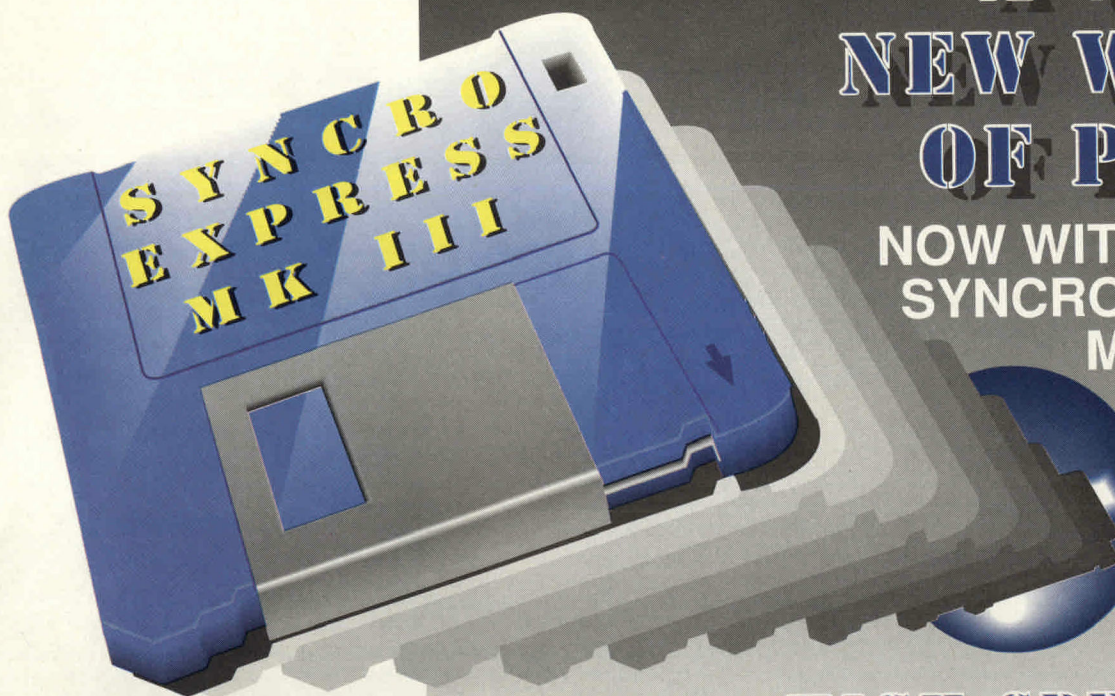


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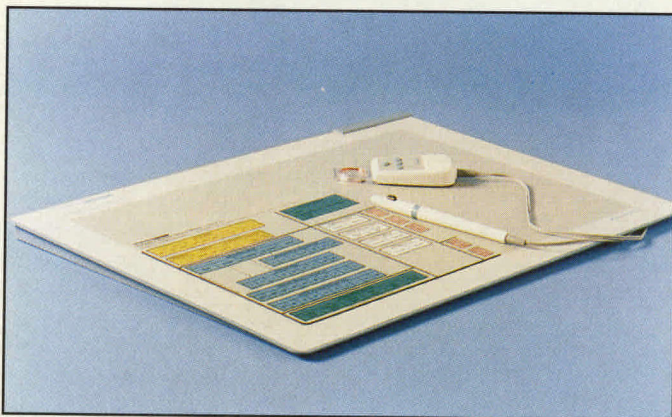


L i m i t e d

SYNC III



# GRAPHIC MASTER TABLETS



**TDS-Numonics' GraphicMaster series of digitizer tablets is now available in a special, low-budget package devised specifically to appeal to both professional and private members of the Amiga community.**

TDS-Numonics say the ideal input device for popular desk top publishing, CAD/CAM, 3D modelling and paint software, "GraphicMaster provides precision sketching and pointing performance far in advance of anything that can be accomplished with a mouse".

These professional quality tablets are priced at £185 for 12" x 12" and £290 for 12" x 18" active surface. The package also has a choice of 4-button puck or pen stylus with two switches for £75; an Amiga software driver and cable pack are included free of charge.

Technical specification is

1000 points per inch resolution, absolute accuracy to 0.025 cm and output rate of 160 points per second.

Operational features include user definable origin, metric/imperial units, non volatile memory, tablet surface menu for set-up and automatic pen tilt correction. Very low power consumption means GraphicMaster is directly powered through its RS232 interface.

**Contact: TDS-Numonics, Lower Philips Road, Blackburn BB1 5TH. Telephone: 0254 676921**

## HELLO TO BERLIN

**April 25th to 28th is a good time to be in Berlin for Amiga users. it is the date announced for the third German Amiga-only show.**

So far some 100 exhibitors have reserved space on the 5,000 sq. metres (45,000 sq. ft.) exhibit floor, located in Hall 1 of the Berlin Convention Complex.

Just as with last year's Amiga '90 Cologne, Amiga '91 Berlin will begin with an Industry Day (Thursday, April 25th), during which the show will be open exclusively to industry guests from the computer and related industries. Industry guests include computer dealers, distributors, developers and press, together with professional

Amiga end-users, - educators, graphicartists, video-, EDP- and MIS-professionals. Industry Day hours will be 10.00 am to 6.00pm.

Amiga '91 will be open to the general public from Friday, April 26th through Sunday, April 28th, from 9.00am - 6.00pm daily.

**Advance tickets (for students and adults) are available in Berlin through Showtime Konzert & Theaterkassen at SFB-PAVILLON, Theodor-Heuss-Platz, Tel: 030-302 5054.**

# The Most Powerful Computer?

The most powerful arithmetical computer built, capable, as one mathematician put it, "of opening up realms of knowledge never before accessible to mankind", has been created with 82,500 individual wires with a total length of five miles. The machine is called Little Fermat, in honour of the 17th century French mathematician Pierre de Fermat, whose ideas it exploits. It is claimed to be the first that can multiply numbers thousands of millions of digits long with absolute accuracy.

The four man team who built it include Professor David Chudnovsky who, together with his brother Professor Gregory Chudnovsky, both of Columbia University, New York, last year won a place in the Guinness Book of Records by computing the number pi, the ratio between the diameter and the radius of a circle, to more than a thousand million decimal places.

Little Fermat, a machine which looks according to its inventors like "a rat's nest of impenetrable machinery" performs its arithmetical wizardry by breaking up gigantic numbers into easily manageable 'blocks' that consist of Fermat numbers.

Fermat's series of numbers, considered by some to be among the most 'interesting' numbers in arithmetic, take the form of the 2 raised to the power of any power of 2, plus 1.

The Chudnovsky brothers

took as their 'block' the eighth in the infinite series of Fermat numbers, the number 2 to the power of 256 + 1, a huge figure which is 77 digits long.

"I think Pierre de Fermat would have been proud if he could see what we have done with his numbers, for which he could never see any practical use" said David Chudnovsky.

"Building this machine represents a tremendous breakthrough, equivalent to making the first supercomputer 10 years ago," said Professor William Alford of the University of Georgia.

"I believe its number crunching ability will bring about unparalleled advances in aerodynamics, chemistry, code-breaking, geology, particle physics, astronomy and above all in weather forecasting where tens of thousands of calculations are needed to predict the behaviour of one molecule of air."

## GRAFEXA

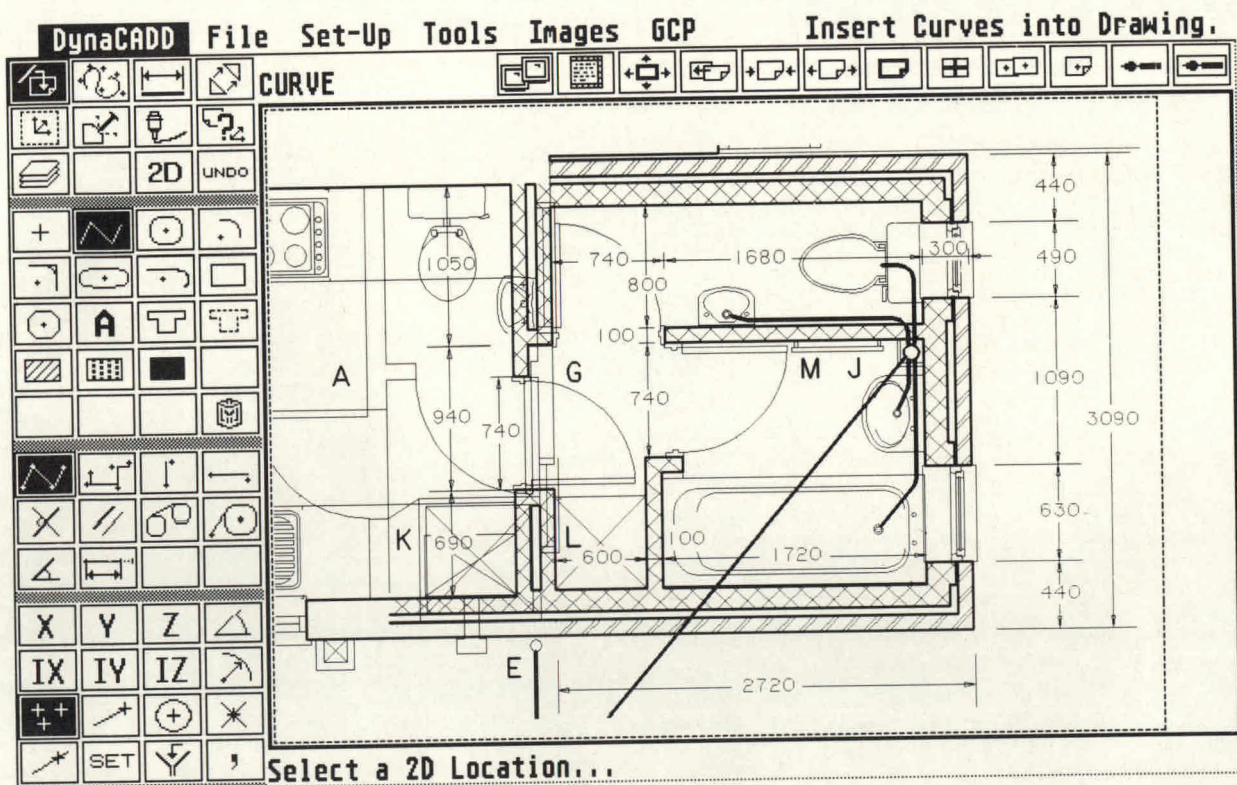
**Recently there has been set up "GRAphics EXTensions for the Amiga" - a group to arrange standards for the Amiga to deal with devices with more colours or higher resolutions than a standard Amiga.**

**GRAFEXA will act as a forum for discussion of the requirements of the new standards and will circulate a newsletter which will include proposed ideas and comments.**

**To be included on the mailing list contact: Uwe Trebbien, Commodore Buromaschinen GmbH, Lyoner StraBe 38, 6000 Frankfurt 71. Tel: (069) 66 38 - 0.**

**For further information contact: Martin Lowe, Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN, Scotland. Tel: 031 - 557 4242.**





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# COMMODORE'S NEW COMMERCIAL DIRECTOR.

Commodore's increasing effort into the PC markets has been strengthened by the recruitment of an industry heavyweight - James Minotto, formerly managing director and a European vice president of Tandon UK, who has joined CBM as Commercial Director.

Minotto's role will be to spearhead Commodore's current drive into the business PC market. (Yes, we we know you've heard about CBM and the PC market before, - but this time...) The company has captured a 4.8 per cent share of the UK PC market in the past twelve months. And they are spending another £1 million promoting their PCs now.

Steve Franklin, Commodore's managing director told AUI: "We are delighted to welcome James Minotto on board and see him as the final link in our drive to expand further into this marketplace. We believe his stature in the industry added to our highly competitive package gives us the impetus to greatly increase our market share."

"Hang on in there, Steve."

"I've always seen Commodore as the sleeping giant of PC based business systems. By re-establishing my partner-

ship with Terry Cooke (national Business Sales Manager), that giant will be waking up," added James Minotto.

CBM have heatedly denied that Minotto is slated to replace the popular and successful Franklin. But CBM is well-known for self-destructive acts. Just this month after a three year legal wrangle, Tom Rattigan, ex-President of CBM has won a case in which he was claiming \$9 million dollars for being wrongly fired. Franklin is thought by many to have made Commodore UK the most successful CBM company in the world. But then Tom Rattigan was considered to have been responsible for saving Commodore from going down when it was losing millions in 1985/6...

Most of those connected with Commodore, we hear, are advising Franklin to 'Hang on in there, Steve'.

## CITIZEN CUT 124D PRICE



Citizen have lowered the price of their 24 pin printer, the entry level 124D, from £279 to £249 RRP. The price cut represents a drop of nearly 11 per cent.

Citizen's aggressive move supports their campaign to attract nine pin users to sample the higher print quality output offered by 24 pin printheads.

Richard Scotto, general Eu-

ropean sales manager at Citizen commented: "As nine pin printers improve in quality of print output and continue to drop in price, many price conscious users are sticking with this technology. In a move to convert nine pin users to the added benefits of 24 pin printing - quality and increased features - Citizen have reduced the price of the well-received 124D - making available 24 pin quality to users on limited budgets."

The 124D is an 80 column, 24 pin machine with print speeds of 120/40cps draft/LQ. It is IBM, Epson, and Amiga compatible and comes with a standard parallel interface - a serial interface is an option.

Two resident LQ fonts can be used in a variety of typesets including quad print, and users can take advantage of the 8Kb buffer and optional 32Kb buffer expansion, for downloading extra fonts.

# COMMODORE Cuts Amiga Prices and raises spec of A500

Commodore has responded to the U.K. Government's drive to multiply the number of computers in the classroom with an aggressive new educational offer on its computers. Intent on increasing the average number of computers from 41 per secondary school and four per primary school, CBM has introduced the special offer of an Amiga 500 computer for £299 (ex VAT). Commodore says it makes them more affordable and accessible to schools.

The Amiga 500, comes complete with 1MB of RAM and the choice of one software package, from a list of well-known titles including Logo with Talking Turtle and Deluxe Paint 11.

Tony Loughlin from Feltham Community school (see report page ?) believes the offer will benefit pupils and teachers alike. "The students even enjoy working with them during breaktime".

Peter Talbot, National sales manager for education at Commodore says "The Amiga is a versatile computer, ideal for anything from basic word processing to graphics and painting applications. this offer of an Amiga 500 with software for £299.00 gives schools more for their money, allowing more children to gain first hand expe-

rience of Information Technology".

CBM UK is also attempting to liven up the depressed UK market with a new drive to sell more Amigas to the public. It is doing it by offering the most popular pack on the Amiga in the UK, the "Screen Gems" collection at the same price as before but with an Amiga 500 that already has a 512K upgrade installed. This means that CBM is at last, doing what has been done already in the U.S. sell the 1 Megabyte Amiga as its standard computer. With so many programs coming out, including games needing the full 1 Meg specification, one meg now seems the accepted and natural standard for the Amiga - and about time too! It does appear a clever move on the part of Commodore to maintain their #399.00 general public price point by giving extra value.

In conjunction with their selling of the 1 Meg Amiga, CBM are also making another Amiga offer. This one is if a buyer hands in his old computer, and they don't care how old or what condition it is in, he can buy an Amiga plus mouse and modulator for £329.00. And we remember when the A1000 with just 256K was on sale for £1700.00...

## SEXY 16 MONTH CALENDAR?

Graphic Expressions have released Girls: Impressions of the Riviera, a digital pin-up calendar for the Amiga. Girls: Impressions of the Riviera is, say G.E., a novelty/utility package featuring a 16 month Calender, a clock and memory-minder as well as 5 user-definable macro keys. (What can they be for?)

"Month after month of stunning girls, meticulously rendered using the Amiga's high resolution full colour graphics", is how G.E. describe it. "All popular images are in IFF format and may be loaded into many of the popular graphics packages.

They could also be printed to create a standard wall hanging calendar.

Additionally, say G.E. Girls can serve as a challenging data disk for use with Femme Fatale. (See review this AUI p.?)

G.E. does give a warning that both products feature adult material. They say the purchaser must be 18 years or older. Do they expect the Amiga to crash if an under 18 year old turns onto June?

**Contact: Graphic Expressions, P.O. Box 110028 Nutley NJ 07110. Tel: 201 661 0408.**



# LOWER PRICE PCs

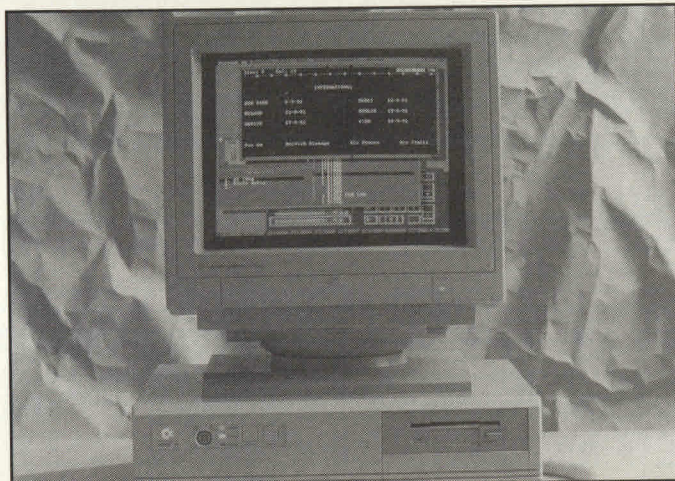
Commodore's new 386SX Slim-Line desk-top computers are designed as economical replacements for their popular PC 50 Series. The new range consists of two models, each available with a choice of disk capacity.

The 386SX-16 (pictured), based on an 80386SX processor running at 16/8 MHz, is offered by Action Computer Supplies with either a 40-MB drive or a 100-MB drive. The 386SX-

20, based on a 20-MHz 80386SX, is offered with either a 50-MB or 100-MB drive.

Prices including two-year extended warranty, range from £1239.00 (MRP £1599.00) for the 16-MHz, 40-MB version, to £1609.00 (MRP £2299.00) for the 20-MHz, 100-MB version.

**Contact: Action Computer Supplies, Alperton House, Bridgewater Road, Wembley, Middlesex, HA0 1EH. Tel: 0800 333 333.**



CBM'S NEW SMALL FOOTPRINT 386 PC.

## FREE ONLINE VIEWDATA

A vast database of practical and useful information is now available to businesses in Britain due to the introduction of a new business viewdata service from electronic publishers Business Online. The pioneering service, say Business Online, comes after 18 months of research into what small to medium sized enterprises want from an online information service.

Unlike existing online information services, Business Online is completely free to users — there are no subscription charges nor usage fees, all the user pays for is the normal telephone call charge. It is completely menu-driven and logical so that the user can go

directly to the information required.

Information on the database has been built up through close co-operation with over 30 official bodies (for example: the AA, CBI, DTI, FIMBRA, Institute of Chartered Accountants, Law Society). Impartial advice is offered on a wide variety of subjects relevant to business, from choosing accountancy services through obtaining venture capital to buying a franchise. The service also carries the Saatchi & Saatchi UK media guide to advertising rates and data.

**Contact: Business Online, Suite 224, Bon Marche Building, 444 Brixton Road, London SW9 8EJ. Tel: 071 738 6262.**

## MASTERING (MISTRESSING?) CLI

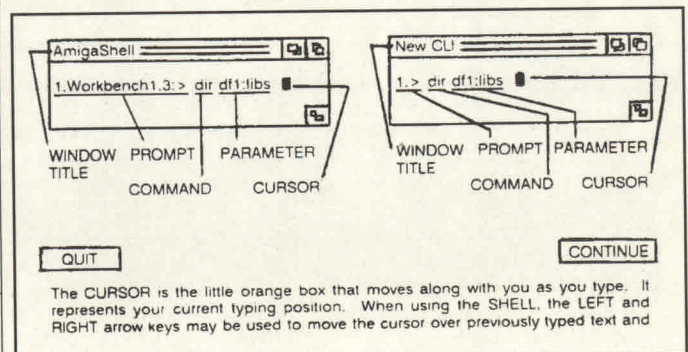
Graphic Expressions call their new package "Gorgeous software with unparalleled intellect" - which may or may not be sexist!

They claim "You'll have to take a closer look at the software to discover why Mastering CLI is much more than just another pretty face".

"Mastering CLI" is a multi-volume software library dedicated to helping all levels of users gain a greater mastery of the Amiga. each volume is created to meet the requirements of a particular type of user.

Volume I is an introduction for the beginner with simple interface which gives a quick smooth start as visuals introduce the power and grace of the CLI and SHELL. Graphic Expressions claim you will be pleasantly surprised by the ease in which you acquire knowledge and become an experienced user.

Volume II is training for the intermediate user. Their interactive Tutor will provide the hands on training necessary to help you polish your skills with the SHELL or CLI. To further reinforce your understanding of the lessons, they claim to have included 'a beautiful Assistant' who will provide you with HELP SCREENS of the most commonly used commands while you actually work with the CLI or SHELL. This beautiful Assistant - does she emerge complete from the Amiga like Minerva from the head of Zeus? If so this is a package worth trying! Ed. (Sorry Ed but as yet, Volume I is marked 'unavailable', and we all know you can't try Volume II until you have 'mastered' Volume I!)



## FOUR COMPUTERS = ONE PRINTER

Four computers can share the same printer by means of a device introduced by Micro Control Systems of Nottingham. Suitable for use with all kinds of printers, including laser printers and plotters, the Simple-4-Switch is available in serial and parallel versions. It is suitable for use in offices and schools.

It enters its automatic mode when first switched on, running a cycle each in which each of its four inputs in turn is tested for incoming data; a light emitting (LED) besides each input port shows which is currently "live".

When data arrives from any

of the computers, the Simple-4-Switch locks on to that source of data and passes it through to the printer until the document is printed. If another user attempts to print a document while the device is busy, his or her data will be "frozen" until the printer becomes available.

By pressing a button on the device it can be over-ridden into manual mode; further presses on the button allow the manual selection of which input is "live", indicated by the illuminated LED.

**Contact: Micro Control Systems, 0602 391204.**



# POWER VERSUS TRANSPORTABILITY

**There are two major trends underway in the portable computer market, according to a new report by MIRC (Market Intelligence Research Corporation).**

The first trend is to move toward more powerful machines with higher speed, stronger microprocessors, higher internal memory, and better mass storage. It is geared toward power users who need a desktop-substitution with high performance and functionality to run powerful software. The second trend is toward smaller, lighter machines, which focus on longer battery life and are geared toward travel and field professionals, whose concern is more toward the size of the machine and how long it can operate without an AC-outlet.

The portable computer market is rapidly changing, say MIRC. Portables that were considered high-end machines in 1986 are today perceived as low-end. In 1986, worldwide sales of portable computers totaled \$836 million, (approx £500 million) and by 1989 revenues had reached over \$1 billion. (£600 million approx).

By 1996, sales are expected to be almost \$5 billion. (£3 billion ? It depends on the pound/dollar exchange rate and who knows that far in the future?).

Miniaturization of portable computers has been possible

because of recent technological advances. Components, such as hard disks, are getting smaller. Some companies, such as NEC, Atari and Poqet, have even abandoned the hard disks and use non-standard credit card-sized memory cards. The components are not only smaller and lighter but they use less power, making operating time and battery life longer. The microprocessors are manufactured so that they are less power-consuming, yet they provide processing power comparable to what is available in most desktop computers.

The use of portable computers is growing, but certain markets are expected to grow more quickly than others. The transportable market is concentrated toward very high-end, fast desktop substitution, and is likely to survive through 1996. There will hardly be any 8088/8086-based computers on the market by that year, and the 80286-based machines are expected to be replaced by high-end laptop computers, says MIRC.

## 80486 Laptops for 1991

The laptop market is developing in two directions. One is toward high-end fast computers competing with transportables, in particular low-end transportables. The other trend is toward smaller, lighter machines.

The 8088/8086-based laptops are rapidly losing their share of the laptop market, being replaced by the lightweight category. The 80286-based machines are expected to be large-volume products, and will see considerable falls in price. In 1992, the 80386-based laptops will start dominating the laptop market, and 80486-compatible machines are expected to arrive in 1991.

The vendors offering lightweights today are few, but the market, (Not the computers, we hope) say MIRC, is expected to explode, with new companies offering small, light and long-lived battery-powered computers.

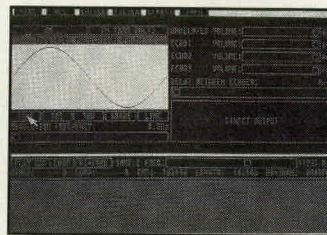
The lightweights will be a great threat to the low-end laptop computers. The first 80386-compatible lightweight machines are expected to be introduced in 1992, but should account for a relatively small share of the market in terms of units shipped.

The technological advancements are aimed at producing more readable screens, smaller hard disks, or hard disks with greater mass storage, and creating components that do not consume too much power. High-end portables are already equipped with video graphics array (VGA) boards, and the first lightweight portables, using active-matrix displays, longer-lasting batteries and less power consuming components

in general.

**For full details of the report contact: MIRC Europe, 54 rue Vanderhaven, 1150 Brussels, Belgium. Tel: +32 (2) 762.2781.**

## 5 TIMES UPGRADED DELUXE SOUND



We hear that Deluxe Sound - no relation to E.A.'s software series - is to be brought to the U.K. Deluxe Sound is the most popular German sound digitiser and has been upgraded 5 times. It has sold over 20,000. In Germany the price works out about £70.00. It is now at 3.0 version, and is compatible with Kickstart version 2.0, watch this space for other news.

## "SPY-PROOF" GLASS FOR COMPUTER SECURITY

If you are worried that your next door neighbour might be eavesdropping on your computer activity...or any other private goings-on, a new idea from Pilkington, the glass manufacturer, might interest you.

Anxieties about computer security generally centre on the activities of hackers and unauthorised access to market-

sensitive data by disaffected personnel. Computer installations can, however, also be vulnerable in other ways.

Electronic signals may be unknowingly transmitted through glass screens and windows and picked up by outside parties or "spies" whose intentions are less than honourable. Valuable data within a computer can also

be accidentally corrupted or destroyed by stray electromagnetic (EM) radiation - radar, for example - entering from outside the building.

Protection against EM radiation, and spying from outside, has hitherto been prevented by placing sensitive equipment inside a "Faraday Cage", either special steel cubicles - effective but very claustrophobic - or a metal screen within walls, floors and ceilings.

Sensitive computer installations had to be housed in rooms

which were either windowless or had very small windows incorporating a fine wire mesh which diffused clarity of view.

To protect against these dangers, a new "spy-proof" glass, Datastop, has been developed by Pilkington.

Datastop, in which the Ministry of Defence, the Foreign Office and City institutions are already showing interest, achieves the same shielding properties by means of special glass coatings which reflect electromagnetic radiation.



# More and More Jack Nicklaus

Accolade appear to be trying to get into the Guinness Book of Records by releasing longer named data disks for the longest named game.

The fourth in the series of Jack Nicklaus accessory disks and compatible with both Jack Nicklaus' Greatest 18 Holes of Major Championship Golf and Jack Nicklaus' Unlimited Golf and Course Design, the latest release is called the Jack Nicklaus Presents The Great Courses of the U.S. Open. (Whew!)

The new course disk, Accolade tell us, contains three of the most challenging and popular courses to ever host the U.S. Open, including Pebble Beach Golf Links, Oakmont Country Club and Baltusrol Golf Club. Jack Nicklaus himself has won at least one U.S. Open Championship on each of them.

Players will take on the challenge of 200 bunkers on

Oakmont, "Maybe the toughest course in the world" according to Jack, or a Nicklaus favourite the "Famous 4th" which he refers to as "one of the most diabolical ever made" as it requires an absolute carry over water to a two-terraced green.

The only thing wrong may not be the length of the course but the length of the name of the game...

**Price £11.99**



# DAATASCAN PRO

**Pandaal are launching "DAAT-Ascan Pro" for the Amiga.**

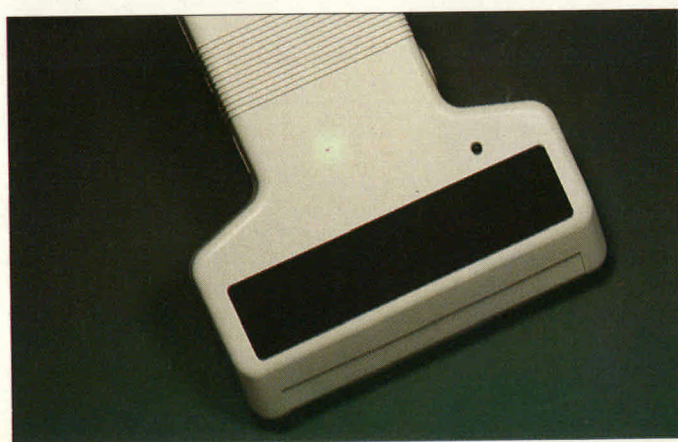
DAATAscan Pro is a handheld scanner which, Pandaal say, has already received wide acclaim for the Atari ST, combining Japanese quality with British software know-how.

The Amiga version features: 105mm scanning width, 100, 200, 300 and 400 dpi resolution; choice of B/W or 3 dither patterns representing 64 grey scales; contrast control; real

time scanning display, zoom & pixel perfect editing, clipboard feature allowing selectable Cut, Copy & Paste; crop, resize, rotate, flip & invert images; supports IFF file format and full printer support.

**Price £189.99.**

**Contact: Pandaal Marketing Ltd., 44 Singer Way, Woburn Rd Ind. Estate, Kempston Bedford MK42 7AF. Tel: 0234 855666**



# DOMARK INTO PIRACY

Domark has sent us a blood soaked shirt (Dominic Wheatley's?) on which there was this cryptic message - "Ahoy there! The Jolly Roger's Flying. Evil pirates, treasure and adventure on the high seas are all part of the action in this swashbuckling fight for food, drink, booty and revenge. Unsheathe your sword - there's more than treasure at stake here, there are wenches to be saved and pirate ships to be overhauled. Fight against the Arch Magus and try to avoid Medusa's deadly stare. Pirate fights pirate in this dramatic hack 'n slash game for two players". We think they are referring to their up coming skull and crossbones game but we could be wrong ... You never know with Domark it could be just an intercompany row going on or even a partly for PR Princess Claire....

They also have coming Hydra. You're in the future now and terrorists rule the seas and skies. When a top secret package absolutely, positively has to get there, the only courier with the skill to get through is Hydra.

With nine missions to complete, success rests on your ability to steer your Hydracraft using its supercharged speed and firepower to blast a path through the enemy. They say, "Whether you're running the gauntlet of boats, jetskis, zeppelins, choppers, fighters of hovercraft, the game delivers

heartpounding excitement and superb action against a backdrop of stunning digitised landscapes." We like Domark's usual understatement...

Another Domark coming sooner is "ThunderJaws" (No, not another reference to Claire their PR princess, we hope!)

Giant cybernetic sharks patrol the shallows and mutant mantas guard the deeps. "Rescue beautiful maidens from being transformed into lizard monsters"> (Of course we will, but will they turn into frogs if we kiss them?)



And yet another... RBI2 is a baseball game. As the manager, you get your own lineup of starters and subs and can substitute from the bench as you see fit. 26 Pro teams are represented, each with a roster of 24 real players.

Looks like somebody at Domark has been keeping busy...They are also talking about a Christmas 1991 Number One already. It is a Tengen conversion called 'Pit Fighter.' No doubt, we will have some Domark superlatives about it in coming months...





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# DRAW 4D

*Peter Lee gives the first multi-dimensional Amiga software for use in both DTP and video applications an in-depth analysis and says "I didn't know I needed it until I saw it!"*

It must be difficult finding a niche in the Amiga's crowded videoware market; most things you could ever want - ray-traced animation, 3-D animators and titlers - exist in profusion.

Many new products are released to improve on a standard (though some actually regress the State of the Art), but with something like Draw4D from Adspec, I didn't know I needed it until I saw it!

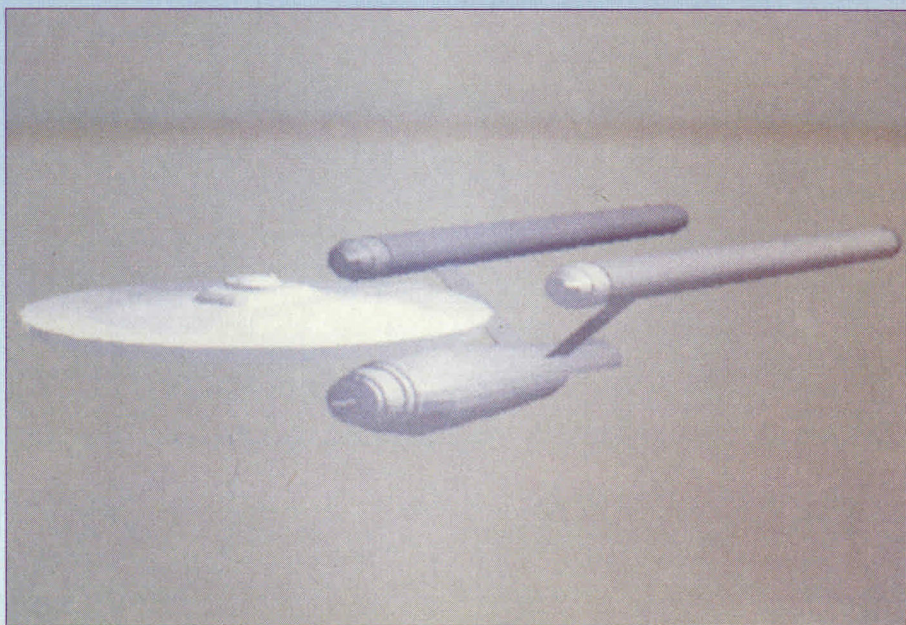
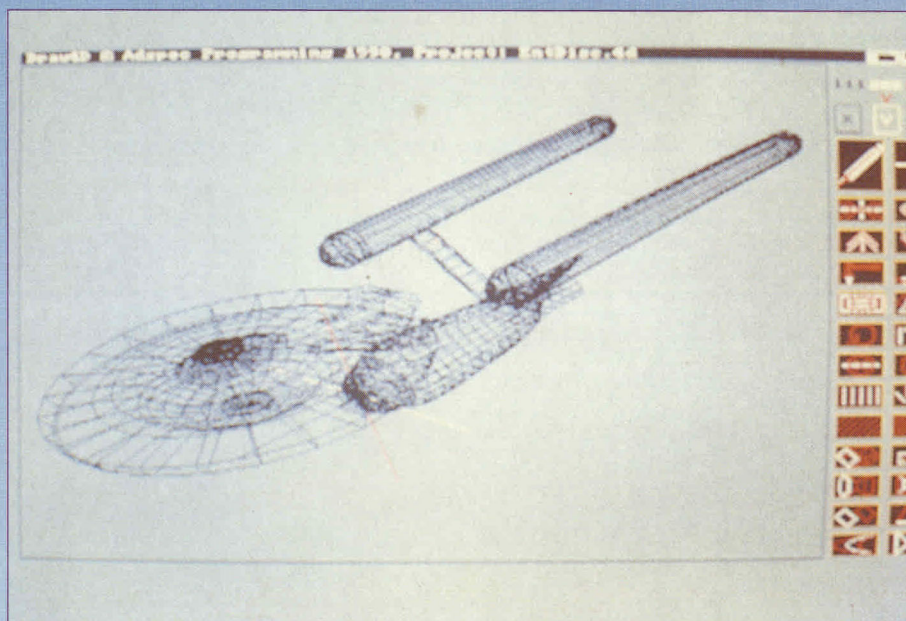
It is a professional multi-dimensional structured drawing and animation program which, due to its output, is at home with video work and desktop publishing. This is not to say it is a replacement for any of your favourite multi-spec animation or structured drawing programs; instead it forms a new branch of production which will add major facilities to your output without claiming to be the one and only program you'll ever need.

The program comes in two versions - regular, and one which will take advantage of a co-processor to help speed things along. It can be easily installed on a hard-drive or backed up, and there is an extras disk and one containing examples. The 172 page manual has been skillfully written by someone obviously well-versed in communicating complex ideas.

A minimum of 1 meg is needed (with more memory gratefully used if available), and multi-tasking is supported (which is very handy, as I'll explain later).

The program's one major problem is the first thing which becomes apparent on booting up; the version supplied for test was NTSC, and output was in this format too. However, we are informed that a PAL version is to follow. The screen is interlaced too, so for those without high-persistence monitors or flicker-fixers, eyes - as well as tempers - may be prone to strain.

Screen layout follows much the same lines as most drawing programs, with pull-down menus and a tool-box to the right.





What is different is that the program opens with a 3D axis rotating gracefully in the centre. At any time during your work your view can be altered in any dimension by using the numeric keypad. This gives a superb view onto your work, despite a perceptible slow-down of the animation when several objects are being calculated and redrawn.

Everything you create within Draw4D comprises of polygons, from spheres to curves. This has the disadvantage of not fully coping with smoothly curved surfaces, but again, the program doesn't claim to be a real-world simulator; what it does, it does very well. If you need to recreate realistic objects, then there are many much more suitable programs from which to choose.

The actual mechanics of the program hinge on the screen editor, which looks deceptively simple. It isn't, but like anything worthwhile, if you persevere the rewards are there for the taking.

The standard x, y and z format to represent the three dimensions are used, and the current editor window view is selected by means of small tool windows. Sadly, there are no multiple views, as in some programs which show top, front and side elevations simultaneously.

The number of primitives (basic in-built building blocks) are restricted to rectangle and arc, and although time-conscious people would have preferred to have cubes, spheres and other shapes to call up instantly, objects can be defined with the aid of requestor boxes; less user-friendly, but allowing more precise control. I'm afraid I don't fall for the manual's assertion that because the tools are so diverse and versatile "the need for primitives is very limited". Not with this user it is not.

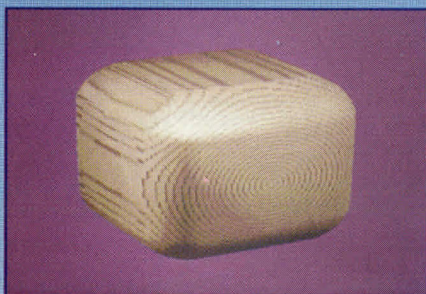
Among wide-ranging editing facilities is the ability to mirror, re-size and rotate; by using the sweep function objects can be turned on a lathe, and as well as the standard extrude comes pipe extrusion. This is a real novelty, and probably the best example of its use is for the delicate shape of a cup handle, but some fine effects can be achieved on two dimensional text.

Indeed, the program comes with two styles of structured fonts, which can be extruded and manipulated in the same way as other objects. You can also define your own structured fonts, and on an optimistic note, Adspec say you can market your own designs.

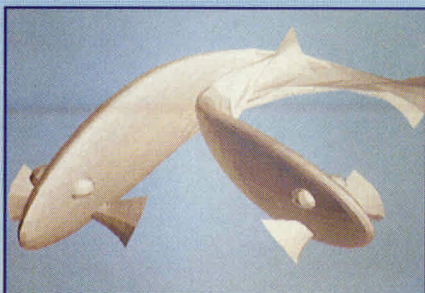
By using Draw4D's animation techniques on text, excellent titles are possible, from the kind which recede into the distance (a la Superman) to exploding titles (the multi-directional Channel 4 logo looks like a doddle for the program).

Tools exist for fine-tuning your work - individual points can be edited, and polygons grouped together for global amendments. Polygons can be cloned, and each assigned a colour and reflectivity, whose

***"To create a path, you firstly create a polygon (a straight line for instance) then tell the program this is a path."***



***"It forms a new branch of production which will add major facilities to your output"***



***"Although it may slow the creation of an animation, you are at liberty to use the Amiga for things such as word-processing, as Draw4D multi-tasks."***

attributes are changed during solid rendering by the configuration of your lighting sources.

#### ANIMATION

An animation editing screen on Draw4D looks something like an ordinance survey map. Polygons tend to stick out every which-way, making it hard to see the objects for the paths (though admittedly, paths are highlighted in red). This is because the program uses polygons as paths. You create a shape (as you would for an object), and once a real object is assigned to it, that object will follow the lines of the shape.

To simplify; if you draw a circle and a square, made the circle a path and assigned the square to it, the square's animation route would take it along the path described by the circle (which, of course, would not be drawn during the animation).

The drawback is that whilst editing paths, you tend to get odd shapes thrusting out of spheres and the like; it all looks like the diagrams scientists draw to try to explain the space-time continuum. But it works.

Once your objects are created - say, for instance, a four-cylinder engine with pistons and crankshaft - you can define the movement of individual components along paths.

To create a path, you firstly create a polygon (a straight line for instance) then tell the program this is a path.

You can then create the parameters of this path which will act on the object - things such as rotation, start and end frames and so on. Using this technique complex movements are built up, object and path at a time. Paths can be linked to other routes, and a path can be edited in the same way as a regular object.

It is when you have completed this that the screen begins to resemble a ball of string which has suffered a cat attack.

But by using Draw4D's superb zoom function portions can be isolated for more precise work. And when things really get crowded, and screen updates really sluggish, you can hide selected polygons and concentrate on the specifics in hand.

This is a specialist program, setting out its stall and sticking to that; it therefore comes with no animation player or print routine. To get full use out of the program it is expected you will have access to these. Superficially this may seem like a cheapskate approach, but we all have our favourite DTP or art packages, and the form in which Draw4D constructs screens or objects enables them to be imported into these.

In the case of animations or screen, the IFF standard is used, and as for structured drawings, these can be saved in the Clip format for importing into Professional Draw or Professional Page. But as the program can render in HAM, you had better be sure your animation package can cope with this mode. Normal low or high res animations can be specified, and



obviously can be simply brought into Dpaint III, or played with one of the proprietary anim players available.

During the rendering of an animation, when a background IFF picture file can be loaded if you want, a status line tells you the number of the current frame, how many remain, and an estimated duration for the process. And although it may slow the creation of an animation, you are at liberty to use the Amiga for things such as word-processing, as Draw4D multi-tasks.

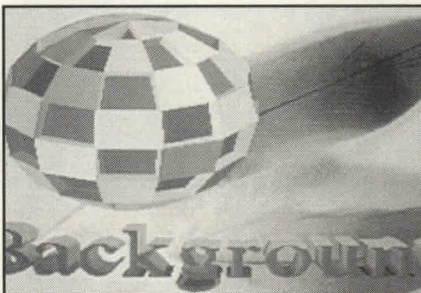
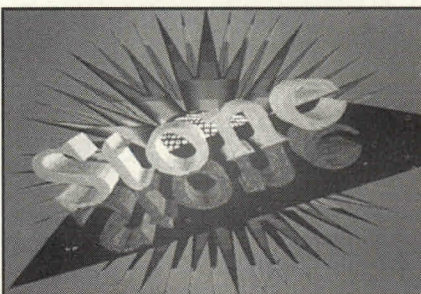
I have to admit to a sense of wonderment at some of the demo images available, as in the short time I have had access to the program, I have been unable to mimic a number of effects; maybe given even more persistence...

Finally, keyboard short-cuts are well-implemented, though of necessity there are plenty to learn.

### CONCLUSION

There is no doubting the power of this program, both in terms of its approach to 3D, and its wonderful animation potential. But you have to keep your feet on the ground when it comes to user-friendliness. Simply because of its range, it is a difficult utility to come to grips with. The manual is a big help, but users should anticipate some dedicated tutorial work to become fully proficient in its use. The results, though, are worth it; it is hard to

***"The ability to save your creations as structured drawings for inclusion in some DTP packages is a wonderful asset"***



begrudge time spent on mastering Draw4D when your work comes out looking so fine. Major problem area for European users is the NTSC format, which coupled with the interlace screen creates a couple of headaches - one actually in your head, the other when it comes to the wasted screen area when it comes to incorporating Draw4D's smaller screens in PAL programs. The ability to save your creations as structured drawings for inclusion in some DTP packages is a wonderful asset, and paves the way to an integrated video and corporate design package in which you can use the same work for title sequences and capture a 'still' for either illustrative purposes or a company letterhead.

This is not the program for people wanting photo-quality images, but given its self-confessed limitations in the rendering field, it is a very useful and unique addition to the animator's kit.

**P.L.**

**Contact: Adspec Programming,  
P.O.Box 13, Salem, Ohio 44460.  
Tel: (216) 337-1329**

## Barry McCarthy offers his opinion . . .

Draw 4D is. . . . well actually, it's difficult to place it in an exact category.

It looks and feels very much like a structured drawing program but it works in 3D and has the ability to animate.

The screen layout is very similar to Deluxe Paint, with a pull down menu and a stack of tools down the right hand side.

In the main work space, your window onto the world that you are about to create, sits a set of axis. Actually they don't 'sit', they slowly revolve. This is where you can design objects using either: a set of built in primitives such as spheres and cubes, a selection of powerful tools like lathe and extrusion, or you may edit point by point. You can then rotate your creation around any combination of x, y and z axis. This all works very smoothly.

Draw 4D is totally point based. This means that you have a great deal of fine control over the design of your objects. You can select a single, or any number of points and manipulate them in virtually any way.

This is where Draw 4D flies high above many other 3D design and animation packages. The tools supplied are all very powerful and adjustable. This, combined with the point orientated editing, means that you seem to be able to create just about any form you wish.

Text is another strong point. Two fonts are included and you can also design your own. The fonts are easy to extrude, slant, twist, bend. . . this is a very powerful and useful part of the program, that I wish many other programs would include.

Once you have designed your objects or scene, you

can animate. All of the tools that apply to drawing can also apply to animation creation. This means that you can very quickly create complex and adjustable animations using paths, acceleration and deceleration.

Finally, of course, we would like to see our finished creation. So it's off to the rendering section. This is, unfortunately, where one starts to encounter problems.

You are provided with two light sources, with adjustable directions and intensities but Draw 4D does not perform raytracing, so there are no shadows or reflections.

It really depends on what you want to use this program for. If you wish to create impressive three dimensional clip art for desk top publishing, then it is ideal in many ways. If on the other hand, you intend to use this package for three dimensional animation on video tape, then the quality of the final image is simply not good enough.

But how about using Draw 4D simply as a scene, object and animation designer and exporting the results to a better rendering package for final viewing?

Another drastic flaw I'm afraid. Draw 4D loads and saves in it's own format. If it was able to save objects in just ONE popular 3D format, then I would use this as a powerful 3D editor and convert the results to my favourite rendering package.

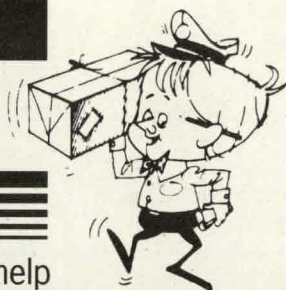
This is a great shame, because Draw 4D is a powerful and well designed tool it just doesn't seem to be targeted specifically enough.

Draw 4D is a powerful package that is severely limited by the quality of it's inability to export to other packages.

**B.M.**



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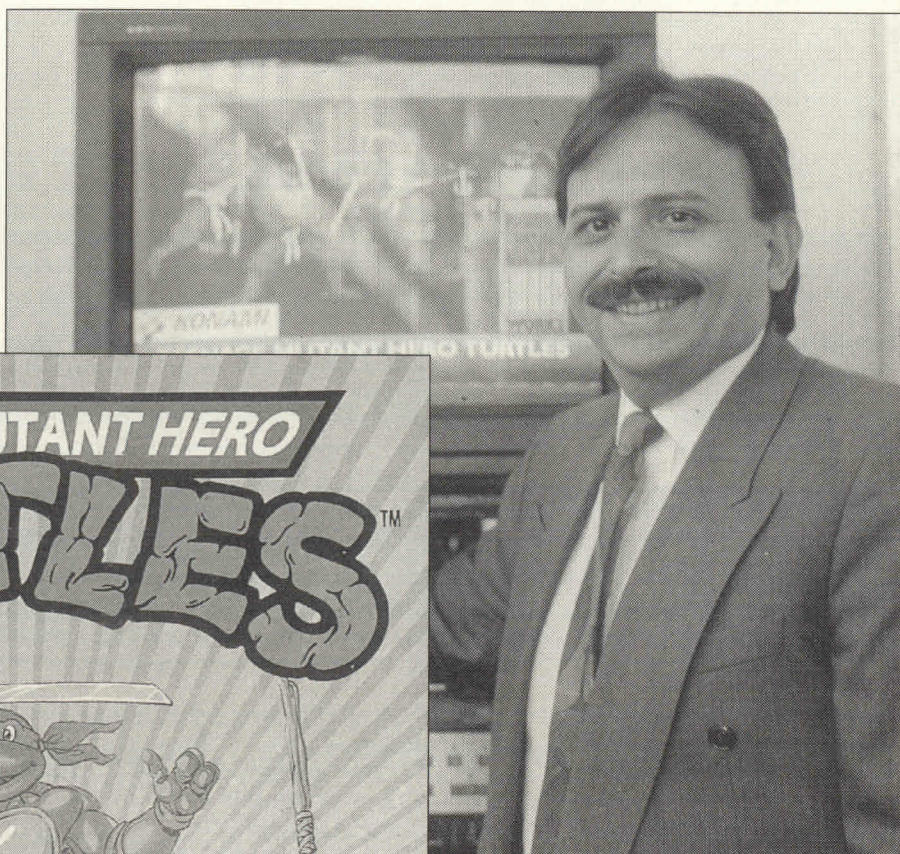




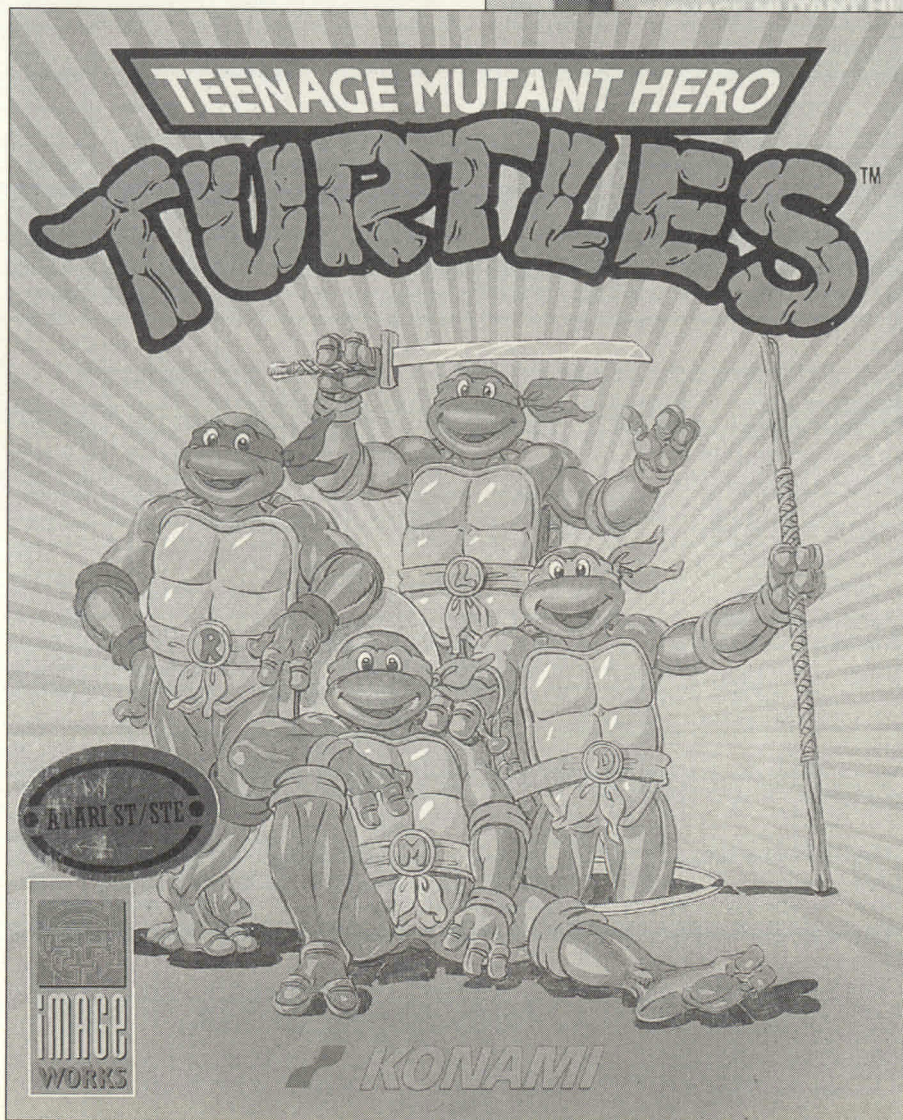
# Turning Turtle

**Managing Editor Antony Jacobson takes a call that makes him think that even some oversold reptiles may not be all pizza and hype...**

It is not altogether unusual for magazine editors to receive calls from Managing Directors of companies involved in whatever speciality the publication covers. Sometimes, rarely, the calls are to congratulate the editor on a marvellous magazine. More frequently the tone is aggrieved, even irate. The companies - or worse the MDs - have been misquoted, misunderstood, more seriously still, maligned. In the computer industry, especially where software is concerned.



**Mirror Soft M.D. Peter Billotta, No 'You - lousy scribble done my baby wrong - song.**



the call is generally to complain of unfair reviews. Unfair, in this context, often means simply unfavourable.

It is not surprising that what a reviewer may think of a product will not necessarily conform with what the "online begetter" believes to be the "truth". Like fond parents, creators of software are sometimes less than detached about the virtues - or vices - of their progeny. When I receive such calls, I take them seriously but while I investigate any suggestion of factual inaccuracy, I generally point out that what we publish is merely our own opinion which may naturally differ from theirs.

Recently I had an "MD call". It was from the Managing Director of Mirrorsoft, Peter Billotta. Not so long ago, Mirrorsoft, in spite of its association with such a powerful



organisation as the Daily Mirror, was not considered a force in the software industry, although it had been in the business since the beginning in this country especially in the educational software field.

Three years back, a new MD was appointed. Peter Bilotta had worked for Activision but was not a very well-known figure in the industry. He was regarded more for financial expertise than as influential in the intuitive business of producing entertainment software. **Amiga User International** was the earliest magazine to consider that the appointment could presage a change in Mirrorsoft's fortunes and we carried the first interview with the new MD, in which he sketched out his ideas on the future.

In the three years since then, Mirrorsoft has grown substantially. It is now ten times the size it was. It has risen to become one of the top two or three companies in computer games in the U.K. and probably one of the major half a dozen in the world. It is also a part of the Maxwell Communications empire which this magazine recently joined.

I thought the man most responsible for Mirrorsoft's success was unlikely to make a telephone call just to complain about a game review; particularly, as he wanted to talk about the most successful computer game of the year - the ubiquitous Ninja Mutant Turtles.

## 600,000 Turtles

Indeed what Peter Bilotta had to say was much more than the usual "You lousy scribbles done my wonderful baby wrong!" song. He commented correctly that our very short, dismissive review had been scathing but he did not object to that. However, he made a number of other points that were very interesting. First, he drew my attention to the fact that our review clearly assumed that the audience to whom we were talking was likely to be disappointed with the Turtles game and while the product had sold over 600,000 copies during the Christmas period, Mirrorsoft had received not one single complaint of dissatisfaction. Secondly, the Turtles, with their universal popularity had brought much needed relief to a depressed industry in a recession-struck country. So much that he had even had telephone calls from dealers and rival software houses thanking him for stirring up what had been a very downcast scene. Thirdly, the constraints imposed by a licensed product, especially in time and restrictive control, can make a difference to the quality of the game.

Reconsidering in the light of those comments, I have come to the conclusion that our review of the Turtles game was misjudged. Not in its attitude to the game, that was a personal opinion of the reviewer, but in our view of the audience for which the game was created.

## Teenage Wrinklies

I would guess that apart from indulgent parents, most of the world over the age of

twelve found these highly-marketed reptiles eminently resistible. Footballs, bubble baths, toothpaste, watches, handcuffs etc.etc.etc raining down bearing their image did not arouse any desire in me except for some distinctly unecological turtle soup. But for millions of small people round the world, the last Father Christmas, and for all I know, Mohammed, Buddha and Shiva, should have been clad in a shell and munched pizzas. It was this trusting and over-gifted group at which the computer game too was aimed.

## 20 Minutes

Since speaking to Peter Bilotta, I have done some ancestral research, questioning parents whose children were of an age group to have acquired the game. In each case, where the Turtles computer game was bought, the point that the Mirrorsoft MD made was borne out. The kids liked it, maybe even loved it, as it was about those fantabulous Reptiles. And one of the reasons for its popularity was precisely that which our reviewer would have found least appealing - that the game was easy. For inexperienced game players the ease with which it could be finished - twenty minutes, I was told once proudly - was a plus not a justification for dismissal.

Taking this juvenile but sincere appreciation in consideration, I now believe we should more carefully have judged whether the game had succeeded in its own terms - those of the under twelves, not those of the anti-Turtle teenage and twenty-year old wrinklies for whom it was no doubt childish and boringly simple.

As for Peter Bilotta's other points, I am less convinced. It may be for him, as a manufacturer of entertainment software, to regard the industry in which his company works as in need of general support. Our responsibility, as a publication, is to our readers; to provide them with unbiased, well-founded information through which they can form their own opinions. We have to take products, the industry and indeed companies as we find them. We clearly had no axe to grind against Mirrorsoft. By coincidence, in the same issue of *AUI* in which we slated the Turtles, we highly praised two other Mirrorsoft games, *Speedball II* and *Harpoon*.

## Hot Fads

On the question of constraints in licensed products, I suppose, it is cash that counts. If a company, in this case it was Konami rather than Mirrorsoft who had the main licence, has a property such as the Turtles and has paid a great deal of greenstuff for the right to market some aspect of it, they are going to get that product out on the streets while the fad is still hot. Nonetheless, according to the Mirrorsoft MD, people like Steven Spielberg are concerned about what is being done to their films and actually want to see the product before they are willing to sign it off. "They do not take the money and run," he insists.

Where, as Peter Bilotta pointed out, a product like *Speedball*, created without a

licence hook-up, might take as long as it needs, as much as two years, to reach the standard Mirrorsoft would want, a licensed game may have to be produced in, say, six months. Hence it might well lack the sophistication that time and effort would bring. If, in fact, sophistication is what is required. "But it is this kind of game that gives us the freedom to develop the quality games for experienced players," says Mirrorsoft's MD.

It is clear that for games, as in many other fields, such as books, critical acclaim too often does not equate to best sellers. Mirrorsoft and other licensees make their hugest bucks out of those down market licensed products, profits, which Mirrorsoft's MD says, can be invested in quality non-licensed games. That is an interesting and commercially valid point. The trouble is that, for me, it turns out to be an unpleasantly acceptable justification for those appalling - or do my ten year old friends say appealing? - Reptiles!

## Senseless Slaughter

Mirrorsoft like most of us live in a commercial world. They do not publish games for altruistic reasons but to make money. Peter

Bilotta is disarmingly frank about it. "Senseless slaughter sells well." Even the supposedly-ecologically sound Turtles - "A phenomenon" he happily calls them - had some 200 acts of violence in their film. So I think it behoves all of us to understand what this commercialised world involves. It means that we cannot take a high and mighty view that infantile games should be intellectual challenges even if that is what we prefer. The Turtles may be kids' stuff but are they any worse a craze than were the Wombles? What would be sad, however, is if the kids only use their powerful Amigas for nothing more than playing Turtle-type games no matter how commercially significant those games may be.

Two ironic notes: One; Mirrorsoft, with those Reptiles, is conquering an age group that they were originally set up to reach but not with games - with educational software (And their present Managing Director believes that the educational sector may yet be worth investing in). Two; the week in which I spoke to him, it was announced that Activision, who were making lordly claims to be world number one when Peter Bilotta left them, had slumped to being taken over and their U.K. company closed down. In recent years Activision themselves had deserted the quality field of games like Infocom (of which Virgin are now making a success - well done David Bishop!) and gone for the Kids' market with games like what one inventive observer called "Howard the Turkey". So nothing is for ever...Not even software trends. Maybe we will yet see a not so commercial, more just and Turteless world!





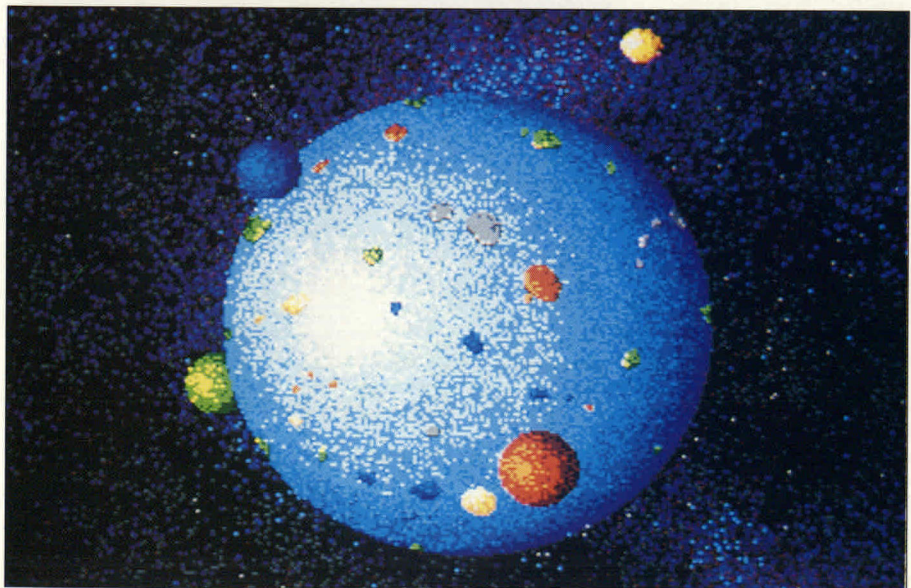
▲ *Mega-lo-Mania*



▼ *Brat* ►



▼ *Mega-lo-Mania*



## Mirrorsoft Rising

As the star of the U.K software scene over the turn of the year with the Turtles running away with the sales honours in every format, Mirrorsoft have something to live up to. In coming months they are involved in a wide variety of styles of game ranging from real kids' stuff to the higher levels of Falcon follow-ups.

One on which they are betting some big money is **Back to the Future III**, the last of the series and linked to the recent release of the video of the movie. Programmed by the everactive Probe Software, Mirrorsoft make no secret that they believe it to be a better game than **BTF II**, which their PR lady, the delectable Cathy Campos, hurries to point out was a top seller and, in fact, is still chalking up return orders at a speed faster than McFly's hoverboard.

Another game they think will hit the charts is **Brat** in which a diaper-clad baby would-be hoodlum has to be protected from dangers by a bionic-type minder - you, the player. Brat looks like a very updated version of the great Marble Madness but with all the improvement of Amiga graphics. It also looks the kind of game that should make a big impact in the States.

Other hefty releases for Mirrorsoft, mostly on their ImageWorks label are **Killing Cloud**, programmed by Vectorgraphics, **Flight of the Intruder**, Spectrum Holobyte's sequel to the international simulator hit, **Falcon**, and **Mega-lo Mania** from Sensible Software.

**Predator II** may also prove another market leader. Aimed too at the younger market, it might seem an odd tie-in, considering that the film is for over 16s. However, La Campos explained, with a wicked gleam in her Spanish eyes, that it was all a part of the Machiavellian Mirrorsoft strategy. Because the kids could not get to see the movie they would want to see the nasty Predator and the game box will contain a separate disk with the graphics of the gory monster as, in the film, and the game which faithfully follows it, you don't get to view the horrid thing until half way through.

We can also regretfully reveal that sometime in the not-too-distant future those green shelled reptiles will be hitting the big screen again with their Sequel. And guess what...who do you think will be producing the computer game Nxxxx Txxxxx II? Don't call me, Peter, I'll call you.

A.J.



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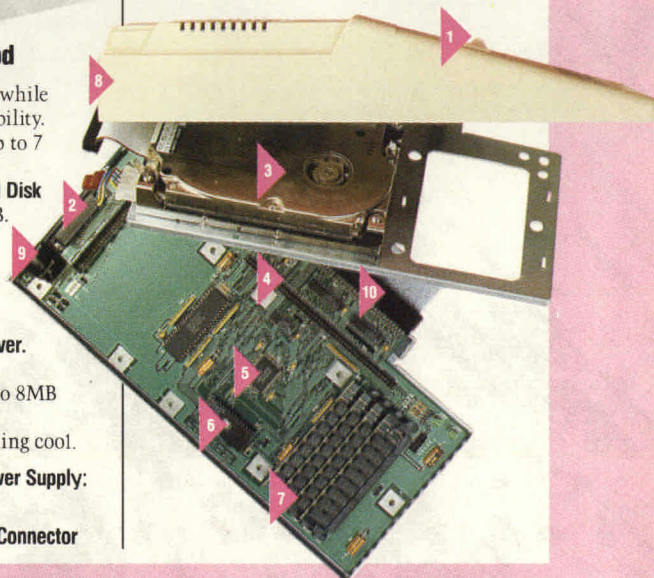
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# Amiga World EXPO Spring 91

***Dateline: New York March 18, 1991. As AUI goes to press, Mike Nelson, still dozy eyed by visions of the Amiga's future, files a hot news report...***

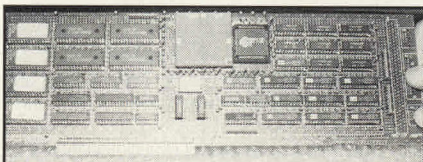
**T**he Amiga World Expo, billed as the biggest Amiga event of the year, was held in the New York Hilton during March, and a pretty spectacular affair it turned out to be. This is a preliminary report on the show, and a full blow by blow account will be in next month's **AUI**.

Firstly, we have yet another taster of that Toaster thing from Newtek. Yes, it is as good as they say, and is actually shipping by the thousand. In fact, the digital effects/mixer/paintbox/titling/3-D rendering package is really taking the States by storm, with almost unprecedented media coverage for both the Toaster itself and the manufacturers, Newtek. Several major announcements of future developments were made, but us poor Europeans with our superior telly protocol, PAL) must remain Toasterless for at least another twelve long months. Watch this space for more details.

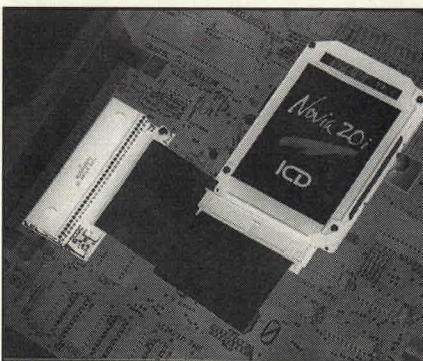
Everyone in America is going for more bits, 24 to be precise, in the graphics display, giving a satisfying 16.7 million colours to choose from. The Amiga Centre in Scotland are supplying the Harlequin board, but M.A.S.T. have developed a low cost 24-bit system of their own. Before you start bemoaning the PAL system, however, the Colour Burst sorry, Color Burst, will work over here, so those options on the ray-trace programs which take half a decade to render anything more complex than a triangle, can at last be seen to be believed. We will be running a review of this exciting product very shortly, and also look out for an upgrade to Blitz Basic which will support Colour Burst (and other little things like Intuition). Tony H. is going to flip what is left of his lid at the prospect of games running at lightning speed in glorious technicolour.

Accelerators are most definitely the order of the day, and you cannot even think about turning up to a half respectable user group with a bare 68000 on board, unless you are fond of being laughed off the face of the planet (perhaps

you're an ex-ST user. We looked at the CSA Mega Midget Racer last issue, but for those who are scared by speeds over 16 MHz and do not really want the 68030, there is always the possibility of AdSpeed, virtually doubling your Amiga's horsepower, without changing the internals such that software older than one week won't run. Not to be upstaged by anyone in the known universe, CSA were showing tantalising views of an A2000 board with that elusive 68040 chip. They expect to start shipping within a couple of months and **AUI** will bring you the details as soon as we can prise one out of UK distributor,



**CSA's 040 accelerator board.**



**ICD's 20Mb Internal Hard Disk Drive for the A500.**

Bytes and Pieces, but we confidently predict another huge jump in processing power.

Hard disks are set to explode into the UK scene during the next few months, with almost every area of size and performance under a constant barrage of

upgrades. The ICD Novia 201 is not a car, but an internal hard disk for the A500. Yes, that is correct, internal; it interfaces to the processor socket and hides under the shielding. Relying on laptop technology, this is currently available as a 20 Mbyte beast, but a 60 Mbyte option will soon be available, and 100 M monster by Autumn.

Speed is also spiralling upwards, with transfer rates of nearly 2 Mbytes of data per second. This is sufficient to display animated frames of 24-bit graphics with 16-bit CD quality sound in real time, directly from the drive, and IVS are currently at the top with their Grand Slam combined memory and hard disk card.

Talking of sound, we have a number of new, fast samplers from both Oxixi and Sunrize. The latter company are also finalising a high quality 12-bit sound board and also a 16-bit version for true CD-quality sound samples.

The annual Amiga graphics competition attracted some utterly brilliant entries, as usual, and the winner was an esoteric vision of computer manufacturing; the chips, resistors and other little bits actually walk to their sockets the RAMs with all their pins moving in perfect harmony is a sight to behold) before lying down gracefully without so much as a jumper of soldering iron.

On the software side, Gold Disk boss Kailish Ambwani put on a entry-level multimedia demonstration using their new product showmaker on MediaShow, but they won't be available for a number of weeks. They received a reception and the future for the Amiga in this lucrative field looks assured (analysts have done their sums and come up with a figure of \$5 billion by 1995).

The sheer scale of the show was impressive, and the emphasis on the Amiga as a true video production tool was incapable. Hopefully it will not be too long before us Europeans get to experience this new area for our Amigas.

**M.N.**



# DynaCADD

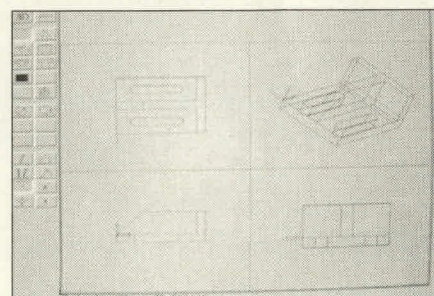
**When a top professional package already a favourite for other computers arrives on the Amiga, it is worth serious examination, says David Leadley....**

**D**ynaCADD is a 2D and 3D draughting package. It comes from Ditek International and is represented in the UK by Expressworks. DynaCADD has been available for the Atari ST and IBM PC for some time now, establishing itself as a leading choice for professional CAD users. When I was asked to review the new version for the Amiga, I jumped at the chance of evaluating what is billed as "The ultimate in CADD for the Commodore Amiga".

DynaCADD comes in a sturdy box, containing the manual, 2 disks and a dongle. The disks are not copy protected, enabling you to back them up easily, but the dongle must be fitted in the joystick port to allow the software to work. The version

thumb through 110 pages, just to get to the introduction, seems fairly unnecessary.

After running the program for the first time, a dialogue box is displayed which enables you to select a "part" and drawing to work on. You will also specify the drawing size, which can be any standard paper size, from "letter" to "A0". Alternatively, you can manually enter any other size you wish. The drawing units and scaling are selected from the dialogue box, and these can be in Inches, Feet, Yards, Miles, millimetres, centimetres, metres or kilometres. If you are really perverse, you could, for example, set the drawing units to "Yards" and the scaling to "39 Miles" equals "17 millime-



**In 3d mode, isometric projections are easily created**

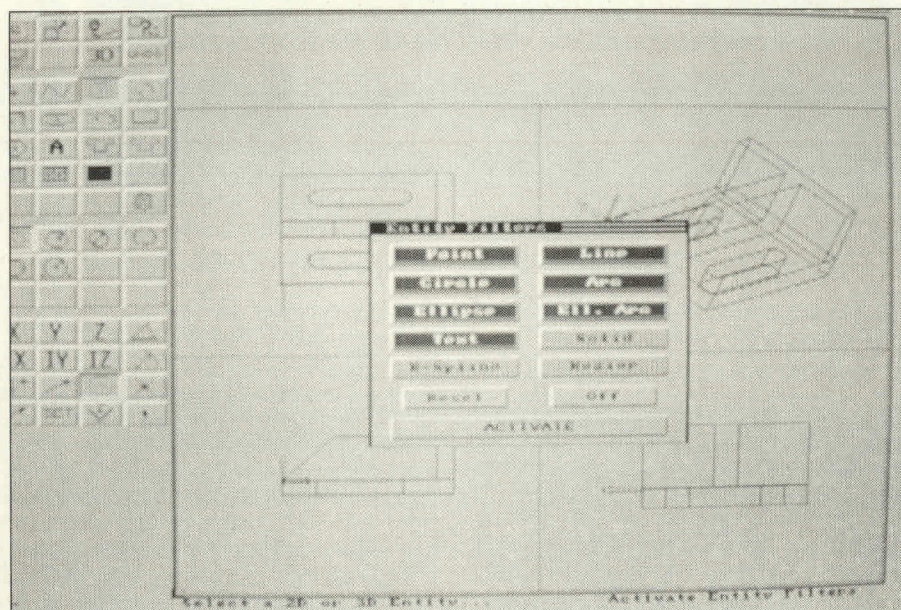
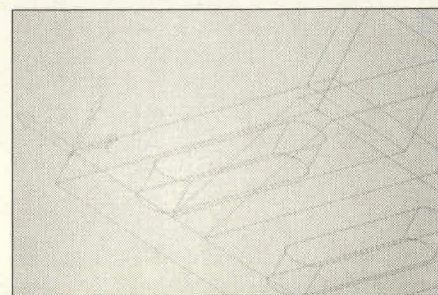
functions of the program, like file transfer and view selection, are available from the menu bar at the top of the screen.

Any geometric object (or entity, as DynaCADD calls them) can be placed or modified in a variety of ways - lines may be placed freely, orthogonally, locked in either the X, Y or Z axis, tangentially between arcs, etc. They can then be scaled, rotated, copied, mirrored, aligned - the list

***"If you are really perverse, you could, for example, set the drawing units to 'Yards' and the scaling to '39 Miles' equals '17 millimetres'"***

goes on. The immense power of the program can seem a bit daunting at first, and with so many options to choose from, it could be quite easy to get confused. Don't worry, Ditek have considered this problem, and solved it by providing a context sensitive help system. If you do get lost, all you have to do is to press the "Help"

***The gcp indicator shows the orientation of the view***



**3dfilter - Filters allow entities to be locked**

received for review, was for an Amiga with 68020 or 68030 plus a maths co-processor and a minimum of 2Mb of RAM. Checkmate Digital supplied us with one of their new CDL A1500's fitted with a CSA Mega Midget Racer accelerator card and an internal hard drive. We were very impressed by this equipment. All we have to do now, is to convince him to lend it to me on a permanent basis!

Installing the software onto our newly acquired hardware was a fairly painless procedure, but would have been made simpler if the DynaCADD manual had been more sensibly arranged - having to

tres". Once all the parameters have been entered, you can begin your drawing.

The program runs in high resolution, and presents you with a drawing area that takes up about two thirds of the screen. To the left of the drawing area, are a series of "Workbench 2" style icons. These are used to select the various commands, such as insert line, curve, point etc. The icons are arranged in an hierarchical fashion, and as you select one with the mouse, new icons pop up, allowing you to perform complex instructions very easily. In addition to all this clicking, you can also enter commands using the keyboard. Other



key, and up comes a window, to explain what the currently selected command is, and how to use it. Should you require further help, the window also informs you of the appropriate chapter in the manual.

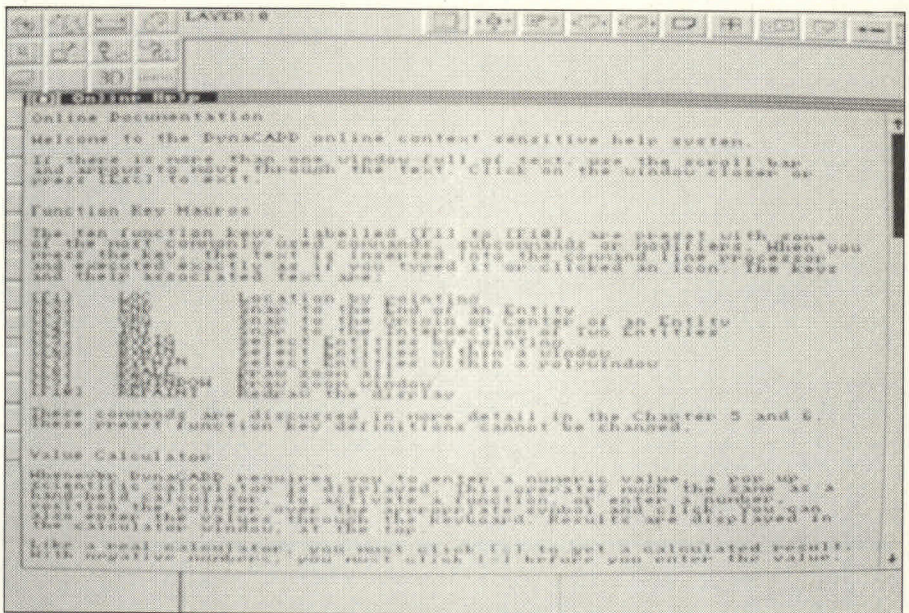
In addition to the help functions, there are two tutorials in the manual: one for 2D drawings and the other for 3D. These tutorials are readily understandable, and take you through the process of making a drawing from scratch, showing you some of the many commands available.

At this point, I must mention my criticism about the documentation. Firstly, it is

***"If you do get lost, all you have to do is to press the "Help" key, and up comes a window, to explain what the currently selected command is, and how to use it."***

fairly obvious that the manual is basically the same as the ST/PC version, with modifications to "Amiga-ise" it. Because of this, there are some references to the program that do not apply to the Amiga version. An addendum to the manual, does point this out, but these discrepancies could be confusing to someone unfamiliar with the Amiga. Secondly, the on-line help suffers from similar problems, with the odd reference to irrelevant keystrokes, etc. These are relatively minor criticisms, but considering the cost of the package, the manual and help facilities do take some of the shine off this fine product.

DynaCADD offers many user definable functions including the ability to create up to 16 separate views of the drawing - very useful when working at high magnifications. These views can then be called up instantly, by selecting one from the menu. Grids can be defined, with the X and Y axes independently adjustable to any suitable size. When a grid is selected, the program automatically turns on grid snap. The only way grid snap can be disabled, is



The online help facility provides context sensitive information

to turn off the grid. If you still need a visual reference, but not grid snap, then you can always use the "Axis" function. This is also definable, and is displayed as perpendicular lines on the screen. If required, this can be used in conjunction with the grid feature.

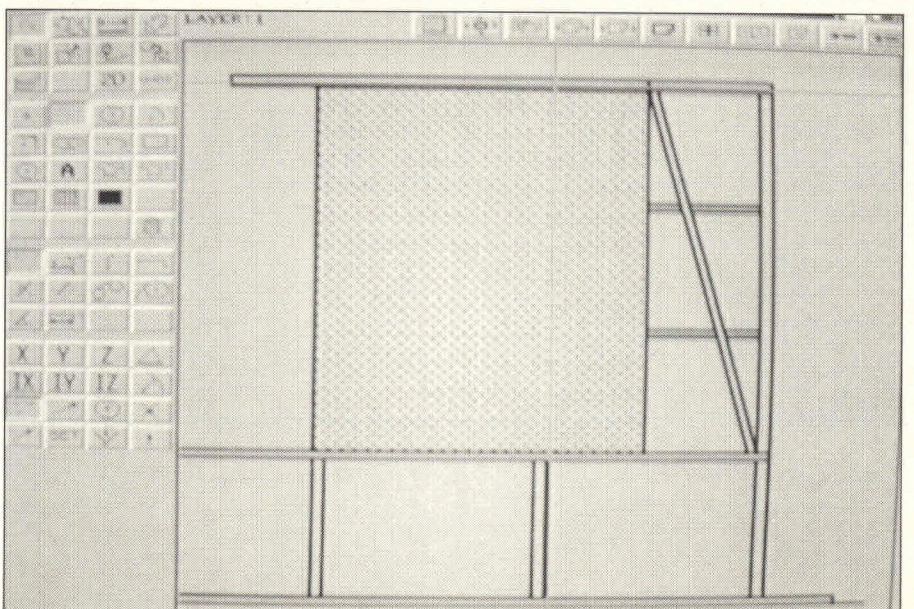
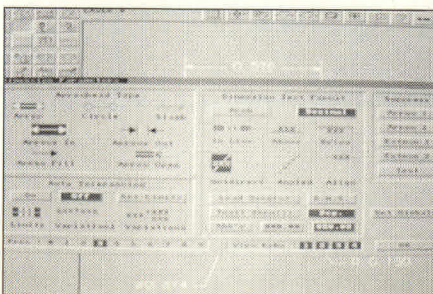
Drawings can be built up, using a system of layers - up to 256 layers are available and each one can be locked or made invisible, making it easier to work on complex structures, without accidentally affecting other entities. A typical use of separate layers would be for the drawing frame and title box.

All entities can be drawn in one of several line styles (all of which can be edited), any one of 16 colours, or one of 3 different line weights. Hatch patterns can be added to any enclosed area in the drawing. The size, style and angle of hatch can all be edited to suit. I did find one problem with the hatching command - if you do not specify a size for the

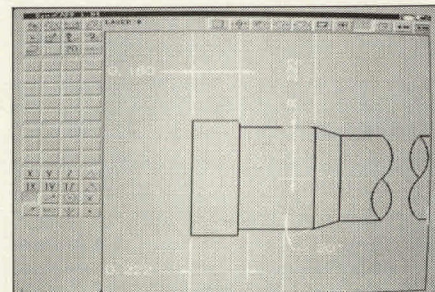
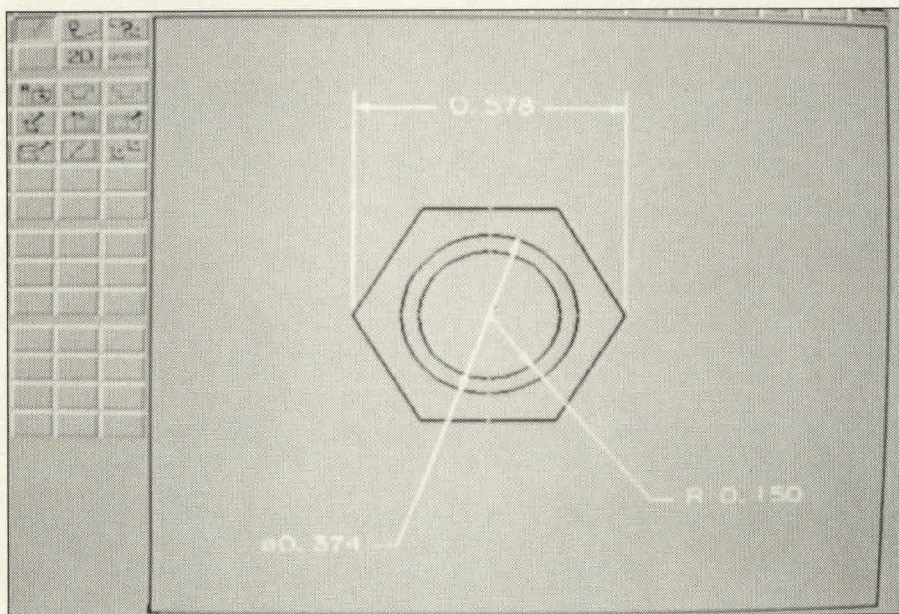
***"DynaCADD offers many user definable functions including the ability to create up to 16 separate views of the drawing - very useful when working at high magnifications."***

Elevation of prototype building (right)

The dimension parameters may be easily defined (left)







Examples showing adjusting screw

## Conclusion

Having used CAD packages for a number of years - mainly on high-end systems, I was very pleased with DynaCADD's performance. Its screen redrawing is very fast, and only seems to slow down when there is a lot of text in the area. If this bothers you, then you can always set text "greek" on, and the program will zip along at its normal rate. Just like any other professional CAD system, DynaCADD will take a while to master fully, but after only a couple of days of use, you should find yourself quite at-home with the program - whizzing about, creating new entities and discovering all sorts of new commands. As mentioned above, the only real criticism I have, is with the documentation. When this is properly sorted out, it will be very hard to find fault with the system. If you are a professional CAD user, looking for a package to use on the Amiga, then I suggest you get in touch with Expressworks, who, for a modest outlay (£25), will supply you with a demonstration version of the program, enabling you to evaluate the product in the comfort of your own Amiga.

D.L.

**Price: £650.00+VAT RRP**  
**Contact: Expressworks, 75 Heath Lane,**  
**Upper Hale, Farnham, Surrey, GU9 0PX.**  
**Tel: 0252 726255**

hatch, it is possible to lock the program, and on one occasion, I managed to crash the computer. So bear this in mind, and save your work regularly.

The program has excellent text handling facilities, and comes with 15 fonts, including 10 Compugraphic ones. After registering the software, you will be sent a font editor, which will permit you to design your own fonts. Text strings are entered

***"Drawings can be built up, using a system of layers - up to 256 layers are available and each one can be locked or made invisible, making it easier to work on complex structures"***

via an on-screen editor and can be placed at any position and angle, in any size, with, or without kerning. The height and width of the fonts are independently controllable, allowing tall or wide text to be easily created.

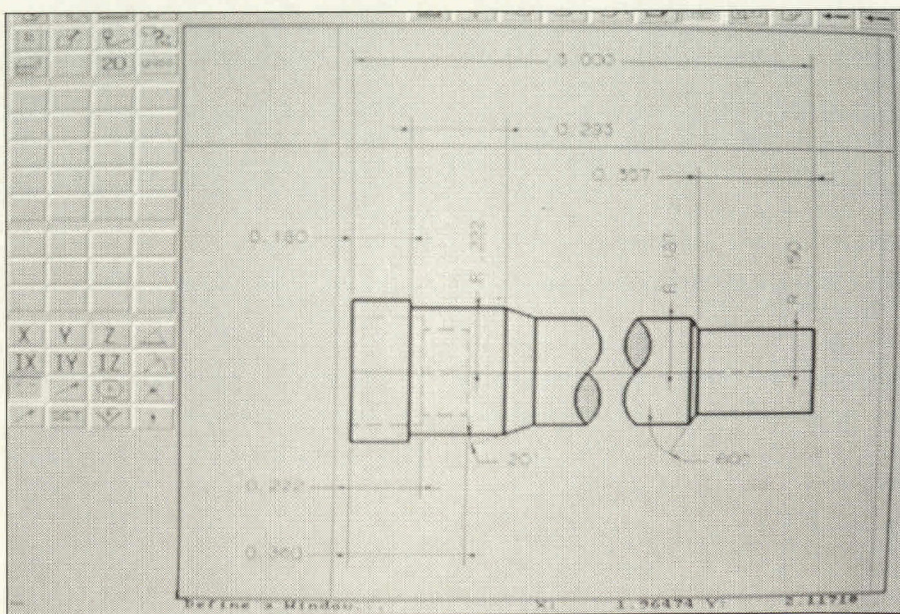
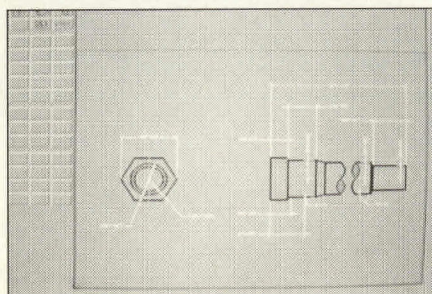
One other feature of the program that particularly impressed me, was the auto-

dimensioning option - any line, circle or pair of points can be selected, and dimensions are automatically applied to them. The style of dimensions can be modified to suit a range of different formats, with open or solid arrows, circles or slashes. Text can be placed above, on, or below the dimension line and angled at 0 or 90 degrees, or allowed to follow the angle of the dimension line.

Drawing files produced by DynaCADD, can be imported from or exported to any other CAD program that supports the popular DXF file standard. The finished drawings can be output to a plotter, Postscript device or a dot matrix printer. The Postscript files can also be saved to disk, enabling them to be used in a DTP program. The program comes with a number of drivers, to suit most printers and plotters; if your plotter is not included in the list of supported devices, then it is possible to create your own driver, using the Makeplot program.

Detail from 2d tutorial (right)

Complete technical drawing (below)





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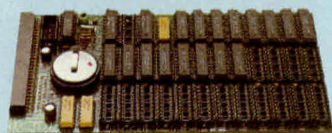
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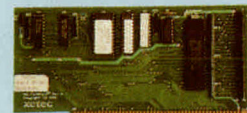
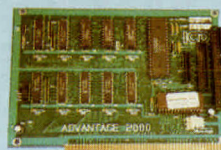
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# THE ANIMATION STUDIO

Disney Software

*Barry McCarthy examines Disney's The Animation Studio to find out whether it will turn Amiga artists into computerised clones of their founder, the great Walt Disney...*

**M**ovement...The creation of a living character or world of your own imagination... Make them do what you want! You can make anything happen! Animation provides you with this possibility.

Animation has come a long way since the days of flicking the corner of a book and watching a stick person run about. Everyone has marvelled at the grace and beauty of Walt Disney's incredible animated masterpieces. The amount of work films like 'Fantasia' took to produce is incredible. Every frame, every subtle change and movement had to be painstakingly drawn and coloured by hand.

Now we have the computer. It provides the animator with labour saving tools. You can define a part of a drawing as an object and then

is a veritable plethora of animation programs now available. They can produce anything from two dimensional character animation up to three dimensional raytraced abstract animation. Among these programs are classics such as Deluxe Paint III and Sculpt Animate 3D/4D.

With this sort of competition, a new contender in this hard-fought area must be pretty good to get anywhere.

## A NEW CONTENDER

It is important to establish just what this new program is intending to do. Unlike the others The Animation Studio is designed specifically for character-based, cartoon type animation.

## PENCIL TEST

You start the program in a black and white drawing area called

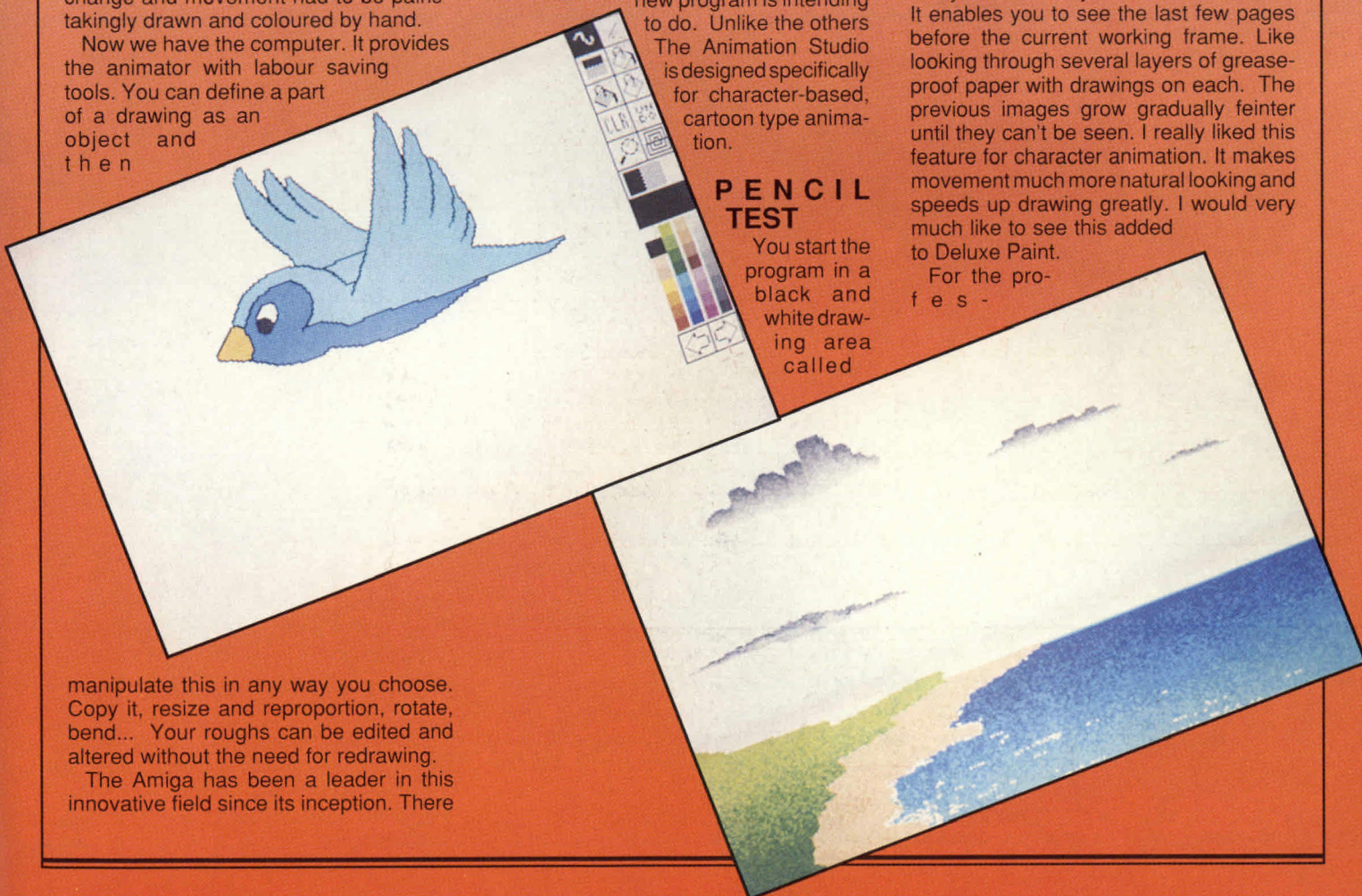
"Pencil Test". This is where you draw and edit the frames or cells of your new animation. It looks very much like Deluxe Paint but in black and white. The tools are limited to the basic drawing functions and movement between cells. It feels like a cut down version of Deluxe Paint III. Fewer and limited tools in a similar layout. It is quickly familiar but what you see is virtually what you get.

The major redeeming feature is the so-called "Onion Skin" effect which comes from traditional animation artists using a material called onion skin paper. This is really useful for any animated characters. It enables you to see the last few pages before the current working frame. Like looking through several layers of grease-proof paper with drawings on each. The previous images grow gradually fainter until they can't be seen. I really liked this feature for character animation. It makes movement much more natural looking and speeds up drawing greatly. I would very much like to see this added to Deluxe Paint.

For the professional

manipulate this in any way you choose. Copy it, resize and reportion, rotate, bend... Your roughs can be edited and altered without the need for redrawing.

The Amiga has been a leader in this innovative field since its inception. There





sional market, it is preferable to work in high resolution if possible. Annoyingly, the tools in this package are resized to a minute level in this resolution and are very difficult to see and to select. I wish companies would sort out this swapping from resolutions and the relative size and proportion of menus. Life would be so much easier if ALL menus and tools remained the same size in ALL resolutions.

## INK AND PAINT

When you have carried out your rough pencil animation, you can move on to the next stage of production. Ink and Paint does what it says. You paint your black and white rough frame by frame and add backgrounds if you wish. It provides most of the Pencil Test tools plus a colour palette of up to 32 colours and a stencil feature for locking out figures when loading a background.

When you have finished drawing your animation and saved it in standard ANIM format, there is one more section that you may enter.

## The EXPOSURE SHEET

This is for adding music and sound effects and for adjusting the timing of the animation frame by frame or over a series of frames.

It is a good idea which I am not sure that has been implemented very well. It is a fairly traditional affair, with text entry for music and sound commands and a totally numerical frame display. In fact, it is just like a wordprocessor but the words apply to pictures. This is confusing for the beginner and slow to use. How much better it would have been with some sort of visual representation of the animation. Take a look at the ANIMATION STATION for just such an approach. Obviously a fair amount of numeri-

cal information is needed but more icon control would be nicer.

You can decide for yourself whether or not, you would like the Exposure Sheet information saved with your animation.

## PRESENTATION

The Animation Studio comes in a smart box, with three disks and two professional looking manuals. The big, "Getting Started" manual, takes you through several simple tutorials, in order to familiarise you with the basic tools and processes. It is written in five languages and turns out to be quite small after all. It took me about five minutes to complete! It felt like a bit of a waste on its own. It would be better, incorporated into the main manual.

The actual tutorials also seemed far too simple. Yes, the beginner needs all the basic stuff but where do you go from there and what about the expert user?. More advanced and more varied examples are needed, especially in the areas of music and sound, the exposure sheet, and editing. It is all presented very well, as you would expect from such a famous name.

The programs all do exactly what they say and all work very well. It is a stable and professional environment.

There is unfortunately, program protection. You must keep the original STU-DIO DISK in drive df0. This is very annoying and not good for back-up purposes. Hard drive installation is easy but you still need to access the STU-

protected by disabling the SAVE function when they are loaded. This means that you cannot ink and paint them or use them in your own experiments. What a shame. All of them have been digitised frame by frame from original drawings by the look of it. And very nice they are too.

## FOR THE ARTIST?

I get the feeling that this program is for artists. You sense that you NEED to be able to draw to produce good results. In fact, you can have an enormous amount of fun, just producing funny or silly animations. It certainly does woo you towards the area of character animation. It really does not matter how well you think you can or can't draw, you can still get involved in this area and have a lot of fun.

## CONCLUSION

The Animation Studio is great for character type animation in the traditional mould of the likes of Disney. This is what it is designed for and this is all that it does.

The range and tools provided still feel limited. Drawing tools could be more advanced and adjustable. It could also have furnished one with more short cuts to animating figures than simply redrawing them. How about inbetweening? That is what I am waiting for in a two dimensional animation package. The ability to define two frames as KEY frames and let the computer work out the inbetween frames. It could use a more visual Exposure Sheet with more icons. The Onion Skin effect is terrific. It is ideal for frame by frame editing and creation of characters.

Overall I cannot really recommend this program. It seems limited to one specific job, which, however, it does in an effective

D I O  
D I S K

each time you load or swap between one section of the program and another.

There are some lovely demonstration examples provided on all of the disks. These are useful and impressive and obviously drawn by a professional animator. The only drawback is that most of the Disney ones have been



straight forward manner. I feel it is too limited except purely for character animation.

The feature that stands out is the onion skin effect. If you want to produce just Disney type animations then this program could certainly be useful.

*B.M.*



**Price:** £99.99

**Contact:** Entertainment International  
**Tel:** 0268-541126

## SECOND OPINION

Peter Lee sums up his view

The Disney organisation have a reputation for high-quality, high-earning products - from feature movies to games licences. The name is money in the bank, but as far as this new release from Walt's stable is concerned, the name is the only thing likely to attract anyone.

Produced by Disney Software, The Animation Studio tries to capture the essence of animation techniques first adopted by Walt Disney in the late 20s - and has these have made mega-millions over the years, who can argue with their success?

But the laborious techniques which have made Disney animation so popular take time and expertise; cartoon features can be many years in the making, and most Amiga users I know get itchy if something takes longer than five minutes to compute.

So the question is, how have the labour-intensive skills of cell animators been translated into a computer program? Very nicely indeed - they have all been included - pencil test, exposure sheet, ink and paint, camera and sound capabilities.

This still begs the question of whether you actually want to go to the trouble of animating in this way at all. Personally, I haven't the time.

Screen configuration allows a choice of high and low resolution modes together with interlace, but does not take account of the extremely useful 64-colour halfbrite mode. In pencil-test mode this is immaterial, as you are working in monochrome, but when it comes to colouring your work, it is something of an omission.

The program's onion skin effect (ghosting previous images) although clever, should be viewed cautiously; drawing animations a frame at a time is a painstaking job, and there are only a couple of tricks in the program to help out.

Something glaringly absent is any kind of automatic brush movement or transition; keeping the pencil test environment as true to life as possible is one thing, but having a computer like the Amiga sitting idly by whilst you try and move a brush across screen a cell at a time is ludicrous. A quick glance at Deluxepaint III's brush animations shows the amazing potential there. And even the

difficulties of animating brushes in HAM mode have been achieved by the forthcoming Spectracolour from Aegis, so there can be no excuses.

Having to move into another program to add colour is probably the straw which breaks the camel's back for me.

### Finally

The Disney badge on this product guarantees its quality. It does not, however, guarantee its usefulness - you'll have to judge that for yourself. There is no doubting that it is superb at what it does, but what it does, doesn't coincide with what I want from an animation package in 1991 - not when we have the marvels of DPaintIII and others. It achieves what it sets out to do, to recreate on computer the skilled techniques and stages of traditional hand animation; this is all very well if that is where your interest lies. There is obviously a great deal of satisfaction to be had by being competent in these crafts. But anyone wanting quick and easy turnaround with the Amiga doing all the hard work in terms of animation and redrawing should think twice. In an attempt to capture the mystique of the past, Disney Software seem to have ignored the thrill of the present; the potential of the Commodore machine has been obscured, which seems a little goofy to me...



# Cando Paks

*Can't do it with CanDo? Then a pair of new support packages should turn you into something of a pro, says Peter Lee, and let you program the Amiga without learning difficult languages...*

**W**hen they released CanDo, INOVAtronics unlocked the door into the hidden world of the Amiga. Anyone with a yearning to program the Amiga, but without the skill or time to master complex languages or machine code techniques, looked this gift horse in the mouth - and promptly harnessed it.

My initial enthusiasm for CanDo has endured, but in all honesty mastering some techniques have been uphill work. One reason for this was the lack of insight in the original documentation and tutorials. I'm a firm believer in dissecting examples to find how things work, but possibly because of a need to launch the product, opportunities for this were sparse, the original program having too few examples.

So it comes as a welcome boost to find INOVAtronics adding momentum to their product with the release of two support packages the Intro Pak, and Pro Pak1. Both require the original program, and each has a thorough manual.

## IntroPak

This is a real must for first-time users, and although a good deal of work has gone in to its production, if INOVAtronics feel it necessary to augment their program in this way, why not include it with the program proper? To my jaundiced eye, it smacks of a clean-up operation to overcome problems encountered by initial users.

The most useful aspect of the package is the inclusion of seven decks, with step-by-step tutorials. Having this as a foundation is a big help in quickly understanding what is, by its sheer size and nature, an intimidating program.

The gradual spread of exercises means that complexity rises with each new chapter, until finally one is guided through the intricacies of the structured programming aspects of CanDo, which for some users prove something of an obstacle.

The examples on disk quite stunningly show the program's potential, and I for one could not have worked out for myself how to achieve some of the effects they contained. Now, the knowledge is shared, because being able to read the scripts,

## CANDO

CanDo was reviewed in *AUI* in March 1990. It is available as a stand-alone program which aids the development of application software in much the same way as AMOS does for games programming. The software is supplied on two disks, one containing the program, the other some examples, and both are unprotected to allow for installation onto hard disk. The hefty manual is vital because of its vast scope, as well as initial difficulty with the software which now seems to be corrected by the launch of IntroPak.

Using CanDo allows users without previous programming knowledge to create professional programs. Produced by INOVAtronics in the United States it is marketed in Britain by Checkmate Digital whose previous contributions to the Amiga market have included the Checkmate A1500 mini-workstation.

and follow the course of events within the program is a good way of learning.

Included in the tutorials is advice on getting animations to run correctly, as well as designing a multiple choice question and answer session, which can be tailored to your own needs.

There is also a nice bonus in the form of a keyboard reader; you can have CanDo read and respond to a keypress now, which is an overdue facility and one which should prove its worth very quickly. The

**"The examples on disk quite stunningly show the program's potential, and I, for one, could not have worked out for myself how to achieve some of the effects they contained."**

utility comes in the form of a KeyInput Object, which is loaded as and when required during a programming session.

Three types of events are associated with KeyInput Objects: Pressed, Repeated and Released. A script written for the Pressed event will execute when the designated key is pressed down. A script written for the Repeated event will execute regularly as the designated key is held down, and a script written for the Released event will execute when the designated key is finally released.

The designated key may also involve simultaneous presses of command keys, such as shift and control.

The manual is excellent, and contains a set of tips and techniques which have clearly been culled from user experience. Little dodges are all gratefully received! - things such as a few simple lines which allow the user to drag out a box on screen, or the best way to incorporate a function in your script without the danger of generating an error.

The publicity blurb accompanying the pack promises to turn a CanDo user into an expert - an exaggeration maybe, but you'll certainly be improving your chances.

## ProPak1

This package requires version 1.02 or later of CanDo, and contains some startling decks as examples and tutorials, together with images and sounds to help in your own work.

It makes a good companion for the 'learner' intro pack, delving further into the subtleties of CanDo with clear and detailed information about how each step is achieved, and what each portion of the script does.

From my point of view, the most challenging deck is the mini-art program, which is small meat really, but which unravels the secrets of some very powerful user-defined drawing routines on which you can build on.

You may also learn how to code games - there is a frustrating one called CodeBuster (we know it as that old chestnut Mastermind) in which you have to guess the colour and order of four pegs by a series of logical responses to your



guesses. And a charming piece of code called Shooting Gallery, which I was amazed to find ran as a single card; it is full of movement as various animated targets (anim brushes) move about the screen awaiting a hit.

***“Anyone with a yearning to program the Amiga, but without the skill or time to master complex languages or machine code techniques, looked this gift horse in the mouth - and promptly harnessed it.”***

Included on the disk is a cross-reference utility which will examine a deck and give you a read-out of various parameters - names of routines, variable usage and so on. In addition, you also get a layout editor tool with which you can specify individual line widths and lengths for running text around irregular objects. Initially awkward to manage, this is nevertheless something I immediately found a use for in my graphic-orientated decks. Cosmetically it works very well.

## Conclusion

Although a number of example decks are games, I would advise the use of AMOS if that is where your main interest lies, because in my experience that is much more suited to games development than CanDo, which is better at doing other, but equally powerful, programming jobs. If, like me, you learned how to use CanDo despite the manual, then the IntroPak would be a little redundant. Anyone new to CanDo should seriously consider it, though for this reason I must again object to improved documentation (albeit with added examples thrown in on a disk) being dressed up as an 'extra' and sold; someone, somewhere, needs a lesson in customer support. But as for the ProPak1 - a great support and a godsend in helping develop techniques for what, after all, is an outstanding program and one which was first to open up the heart of the machine.

P.L.

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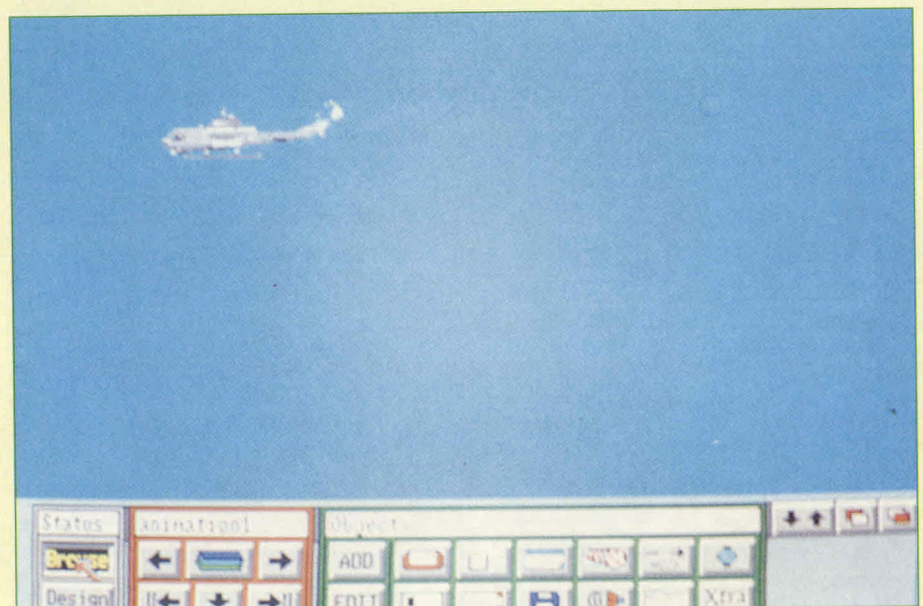
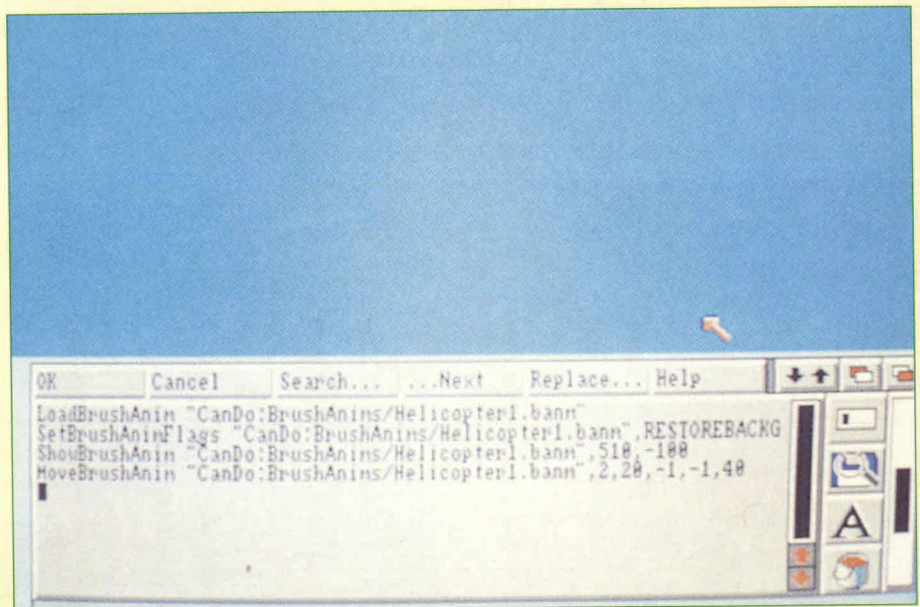
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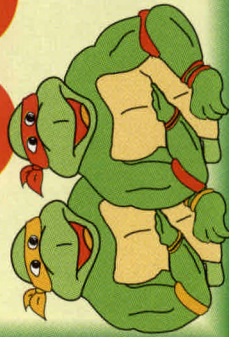
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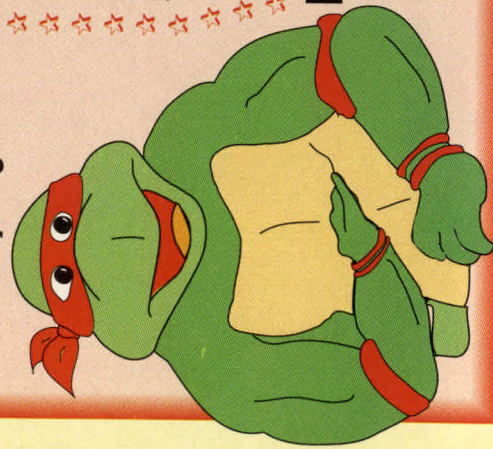
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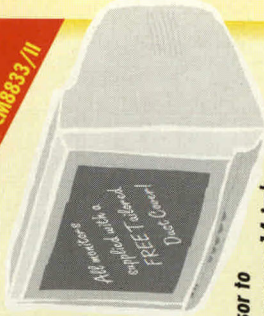
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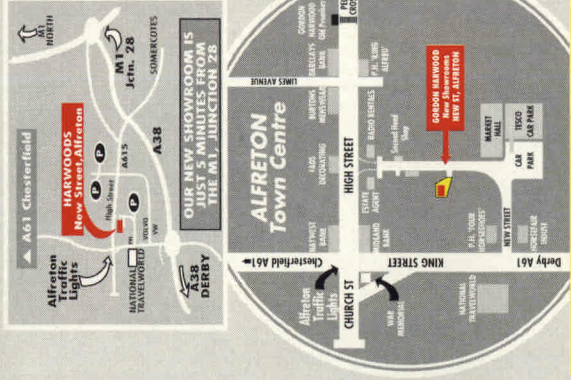
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# FRACTALS AND CHAOS

## Part 1

*Do you ever get the feeling that you have no control over your life? Are there strange forces at work? Is the universe out to get you personally? Is the Mandlebrot Set a hiphop group, a German bread, a new hairstyling or something you can do on an Amiga? In this first installment of a fascinating series, John Kennedy cuts through chaos to uncover what is really going on...*

### Introduction

Every Public Domain library has at least a dozen programs to display the now famous Mandelbrot Set. But just what is this strange pattern of colours? Do they have any real meaning?

As you may know, it's all to do with mathematics - but don't let that put you off. Most of the maths is incredibly simple stuff, and doesn't even require knowledge of trigonometry or nasty things like that. If you have come across a square root, you'll be able to understand the formula involved.

Fractal geometry is simply a different way of looking at curves and shapes. The idea has been with us for hundreds of years, but until the advent of the computer it was almost completely ignored. Now with micros as powerful as the Amiga, you can explore this unfolding science yourself.

Like most great discoveries, a lot of what follows happened by accident. Sometimes experiments just don't turn out the way they should, and when investigated, they lead to whole new branches of science. So it was with Chaos. The signs had always been there, but no one had noticed them.

New applications of fractal geometry are being discovered every day. The recreational aspects include the generation of natural looking landscapes by simple programs or the analysis of the patterns inherent in music. More practical uses include constructing realistic models of dynamic systems, speech recognition and even methods of data compression.

### Fractal Geometry

Fractal geometry began when mathematicians started drawing strange looking curves. These curves were unlike any seen before, and had all sorts of peculiar properties. They were self-similar, in that magnified portions looked like the original.

Their length was difficult or impossible to determine and worst of all they didn't seem to conform to the normal number of spatial dimensions. We are all used to the three dimensions of height, length and breadth. Most objects in the real world have these three properties, but are different in the world of mathematics.

For example, a straight line has only a single dimension of length, whereas a mathematical plane has two dimensions, length and breadth.

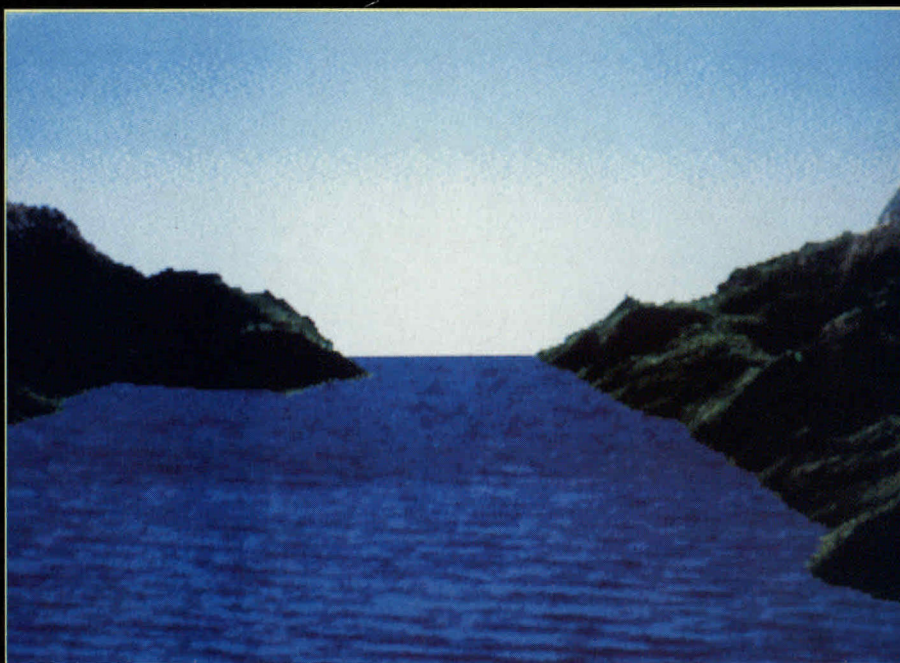
However a squiggle on a piece of paper can't really be said to have one or two dimensions, but a dimension somewhere in between.

If it were one dimensional it would be a smooth line, and if it had two it would cover

every part of the paper.

In other words, these new squiggly curves seemed to have dimensions that weren't integers, but fractions. For example, the von Koch snowflake (figure 1) had a dimension that could be calculated to be approximately 1.26186, and the coastline of Britain had a dimension of about 1.26. These non-integer dimensions lead to the term 'fractal' being used to describe them, coined by Mandelbrot in 1975.

This sort of fractal thinking upset a lot of traditional mathematicians, who steadfastly refused to have anything do with this type of nonsense. "It will never amount to anything much" they said, and went back to their slide rules.



*Scenery like this is produced by fractals.*



And so fractal curves remained a mathematical novelty until the advent of digital computers. The maths required to generate the curves was usually boring and repetitive, and so no one could really be bothered to sit down with a pen and paper to explore properly. Then came computers which could do the sums themselves. Better still, along came computers with graphics, so that the results could be seen in a pictorial way.

Mathematicians rely heavily on graphics to make sense of the formula they work with. For example, the hyperbolic function 'cosh' mightn't mean anything in its written form, but when a graph is plotted, it just happens to be exactly the same shape as piece of rope suspended at both ends. Being able to visualise an equation is an important part of mathematics.

### The Mandelbrot Set

The Mandelbrot Set has become the most popular expression of fractal geometry. There are dozens of Public Domain programs available which will display the set for you. But what on earth is it?

Well, the M-set is a fractal curve produced by repeating a simple formula many times. By using different colours for different results of the formula for each point on the screen, we obtain the famous multi-coloured splotch.

Here is how to produce a Mandelbrot Set. First take the starting equation like this:

$$Z = Z^2 + C$$

where both Z and C are complex numbers.

What this equation says is:

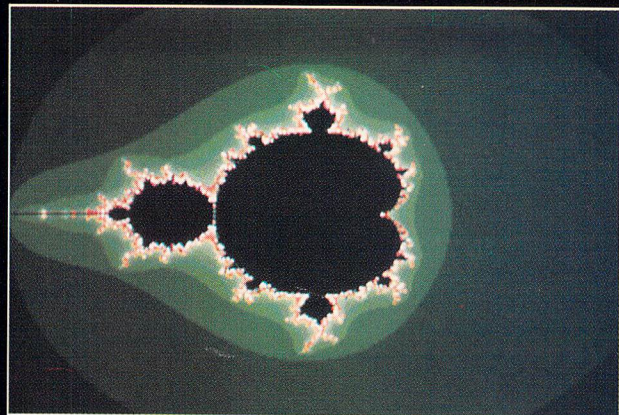
"Take a number Z, square it, and then add C. Now take the answer and square it and add C. And then do it again. And again. And again..."

(Calculations are further explained in more detail in the **Complex Arithmetic Made Easy** section.)

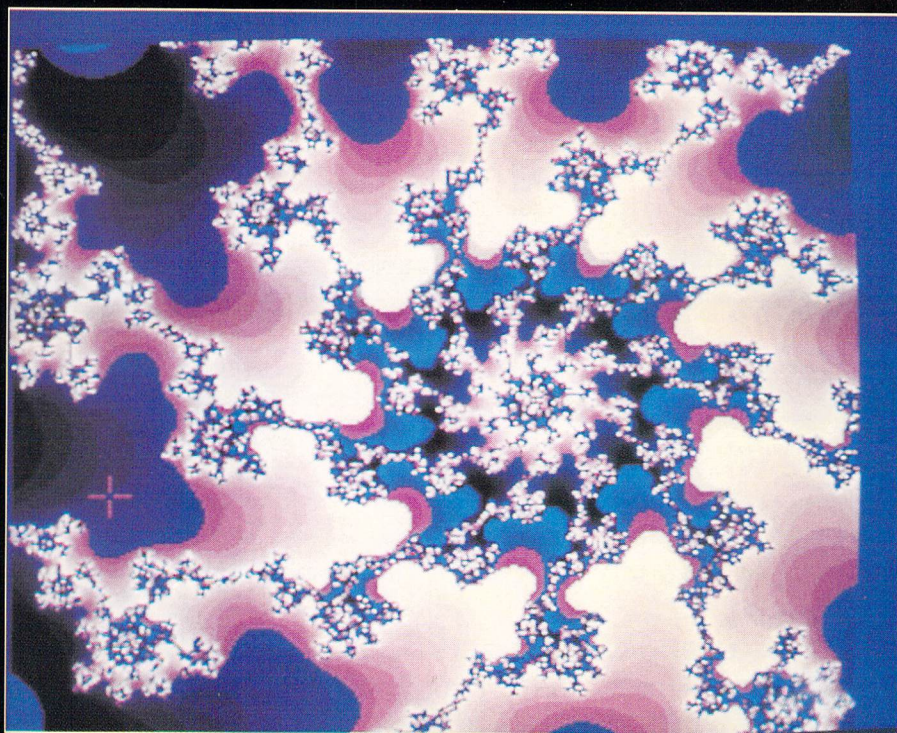
In programming terms, this equation uses its output as input. If you were to let it, there is no reason why it would not continue forever. You just decide what the starting values for Z and C are, and then set it off.

When Z is a real number (that is, it has no imaginary part) and C is zero, the equation is quite easy to understand. If the starting value of Z is less than one, Z will tend towards zero. If the starting value is greater than one, Z will get bigger and bigger: it will tend towards infinity or 'blow up'. If Z is one, it will stay one forever.

When we start using complex numbers in the equation, things start to get a bit more unpredictable. The equation will still tend towards infinity, but a tiny change in the starting values can make a huge change in the rate at which it blows up: it has a chaotic behaviour. The colours in a



Above: Figure 1.  
Right: Figure 2.  
Below: Figure 3.



Continued on page 100.



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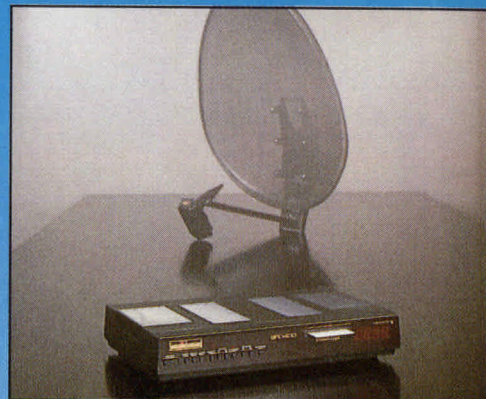
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AUI



# Back to the

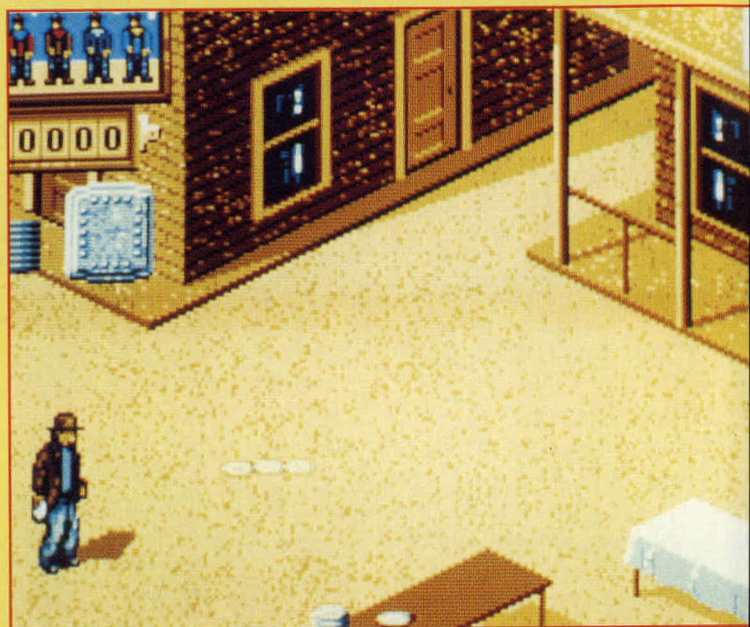
## Imageworks

**T**he first Back to the Future storyline was confusing enough, and now we've reached the third episode, events have got even more twisted. One complication after another has lead to Marty and the Doc being sucked back to the late 19th century, the days of the Wild West. Although the Doc had decided to throw in the towel on all this time travelling, the discovery of his imminent death has persuaded both him and Marty to get back to 1985.

The multi-stage format pioneered by Ocean has been used, with a selection of scenes from the film recreated in a collection of sub-games. From the options screen, you can choose to practice either the second or third of the four levels, or have a crack at the whole thing from level one.

Coincidentally I presume, the first stage is very similar to level one of Readysoft's Wrath of the Demon, also reviewed this month. In pursuit of a runaway carriage, you ride your steed across a parallax scrolling background. There are ditches to leap across, bonus items to pick up from the ground, red indian tomahawks and stray pieces of luggage to avoid. This is shorter and more playable than the Readysoft version, and gives way to a second horseback section.

Here you see yourself from above, as you ride through a gunfight between the cavalry and the indians. Bullets are flying from both sides, but you can only safely shoot the indians. Kill



# BRAT

## Imageworks

**N**athan is a quiet one-year-old baby. At least by day, but after his sweet little head hits his cot-pillow and he is asleep he has the wildest dreams. Nathan becomes a brat in Bratland. Every night he travels through the three lands

*"Time to party, dude!"*



of Bratland looking for trouble. The big problem is that, as he's only a baby, he'll get more trouble than he can handle which will

*The Jack-in-the-box knocks poor Brat off Toytown, but the milk bottles (on the menu) restarts the game from where he falls. Otherwise its back to the start of this stage.*





# e Future III



a cavalry man and your score takes a dive. Soon after, you find yourself caught in the crossfire of another battle, this time with the cavalry attempting to stop a bank raid.

Level two is a traditional fairground duck-shoot. Ducks are shot for points, while bonus targets in the background can be knocked out for bigger prizes. Some comical sound effects liven up this otherwise unremarkable interlude.

***“There are ditches to leap across, bonus items to pick up from the ground, red indian tomahawks and stray pieces of luggage to avoid”***

The third level is a custard pie fight with a gang of outlaws. It's set on a single isometric 3D screen, with the gangsters hiding in the bars and hotels around the town square. As they peep out from behind the doors, you have a few seconds to land a direct hit with a pie, using the “aftertouch” feature to fine-tune your aim. The awkward controls and lack of humour or excitement combine to make this the low point of the whole game.

temporarily bring him out of the dream. As Brat's (don't call him Nathan by night) Guardian Angel, it is up to you to keep Brat dreaming, so that he has a pleasant, however hectic, nocturnal rest. To do this you are equipped with a menu of tools.

Bratland is an isometric 3-D world with the play area raised. The boundry of the play area is not protected so the first obstacle, or danger, facing Brat is that he may fall off. The six arrow keys on the tools menu are used to pick up directional arrows which can be placed in front of Brat's path. When he walks directly over them they disappear, but divert Brat's orientation to that which the arrow was facing.

The play area scrolls from bottom to top, so Brat's second

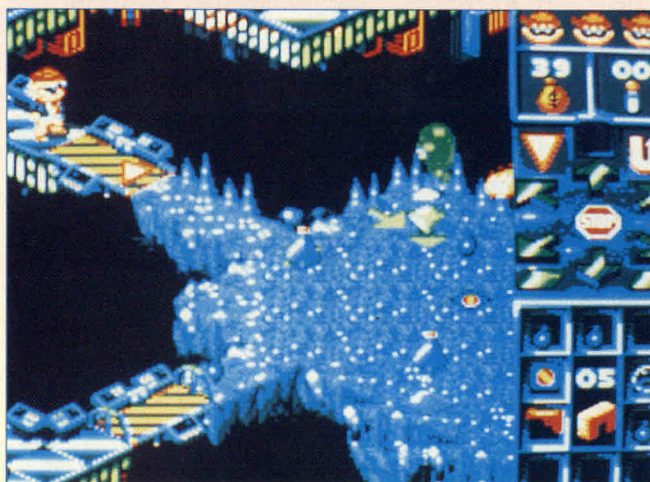
task is not to lag behind the scroll. This can be done by continually guiding Brat towards the bottom of the screen, but

***“Objects which can foil the ‘baddies’ plans to knock Brat out of his dream are scattered conveniently around Bratland and the menu allows 10 to be carried at any instance.”***

'reverse scroll' and 'stop scroll' will do the desired deed for 10 seconds. These special menu tools can be picked up by Brat as they are strategically placed throughout Bratland.

Brat's final level is on Moon Base which hosts aliens and robots.

***In Parkland Brat can play on the roundabouts, but must wade through the water, and there's sharks about!***





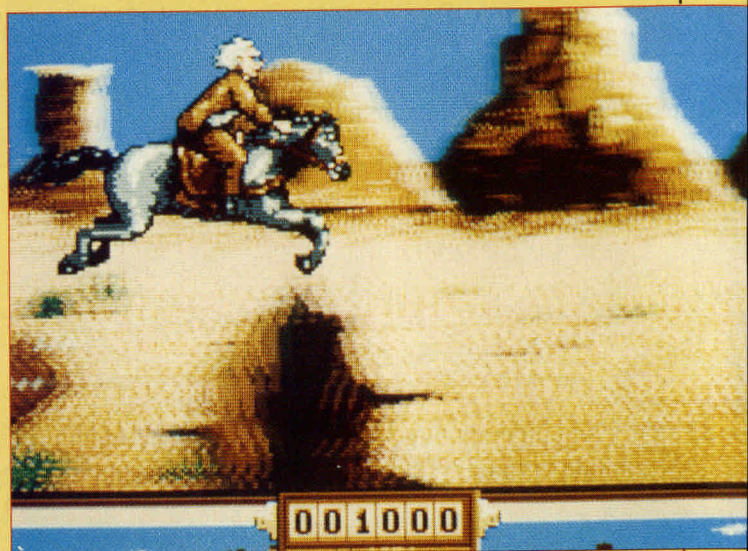
## Back to the Future III

Finally there's a race across the roof of a speeding train, during which you're accosted by more gang members, who can either be dodged or sorted out with another of those pies. Collect enough logs to stoke the fire, get to the front of the train and hop into the DeLorean, and you've finished the game.

Hugh Riley, he of the famous Rolls Royce illustration (sorry Hugh), was given the job of graphic artist. Although the graphics look suitably dusty and dry, they're not classic Riley stuff. The sound is a combination of twangy banjo music and sound effects. Unfortunately there's no option to disable the music, so most are going to be forced to cut the sound completely to keep their sanity.

There are two ways you could view the diversity of gamestyles on offer. The intention is obviously for the player to feel he's been given a collection of varied games for the price of one. The other, is to see the game as a compilation of souped-up "type-ins", which move from one to another with no apparent flow or logic. What you get isn't far from that old C64 budget game Kane. That went down well at the time, for the price, but Back the the Future III is selling for a fair bit more than £2.

As long as the potential buyer knows what he's getting, there's no problem. If you're expecting a flowing, well developed arcade game, you may well be disappointed with BTTF. If however, you've enjoyed the style of games such as The Untouchables, Licence to Kill, Ghostbusters II and Nightbreed,



you'll probably go for this too. It's far from the best example of a multi-scene game but if as so many of the Amiga owners, you arrived on the scene through the welcome gift of an A500 as your first computer last Christmas, you will probably find this a worthwhile and entertaining challenge.

T.H.

**Graphics: 72% Sound: 43% Playability: 68%**  
**Absolute Value: 69% Price: £24.95**

## BRAT BRAT BRAT

Brat will also have to contend with various obstacles which prevent his, and your, journey through Bratland from being simple. Some of these objects include; gaps in the path which must be fixed using bridges, moving soldiers, cars, robots, and sharks etc. which must be halted with various applicable objects.

Bratland has three different levels, Toytown, Park Land, and Moon Base, each of which has four stages to conquer. Brat is given three lives in which he can try to finish one of the four game stages. Each time a game stage is completed a special code is given which enables Brat to skip previously completed territory. If Brat loses three lives he will have to restart from the beginning of the stage last achieved.

Bratland's display area comprises a 'play area' and a player menu screen. The mouse is used to pick up objects from the menu and place them on the play area, while Brat picks up objects from the play area which are automatically placed on the menu.

The game's introduction is similar in concept to the Psygnosis intros, and the digitised speech and graphics are of good quality. The whole game's presentation is well implemented and there's even a demo option which allows players a glimpse of each of the worlds, and what to expect from them. By watching these demos an understanding of the game's controls can become clearer.

Brat's gameplay concept is, in a way, similar to Lemmings. You control the movements and actions of a 'dumb' being who will self-destruct at a given opportunity. Thankfully there is only

one Brat and the graphics are much larger. The well-drawn 3-D isometric play area gives the game a cutesy aura, and the accompanying soundtrack is pleasant enough not to need to be turned off! Overall, Brat is a very agreeable little game.

P.K.

**Graphics: 88% Sound: 92% Playability: 80%**  
**Absolute Value: 82% Price: £24.95**

The game is supplied on two disks and works on 512kB machines but it does not use external second drives - the fated insert disk B and press mouse button is displayed whether or not your 2nd drive is connected. Control is via the mouse.





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# GO!

## Oxford Softworks

*"Do not pass GO!" is an instruction Anthony Mael takes to heart after meeting a Korean gentleman and some suntanned girls..*

I once belonged to a squash club which had an eccentric owner. Among his later eccentricities was the setting up of a separate space for some chess enthusiasts. The quiet room possessed a very different atmosphere from the sweaty, highly physical, orange juice guzzling, victorious highs or head-sunk-in-exhaustion lows of the rather macho club. One day, the contemplative chess people were gone. They had been replaced by a mysterious, more valuable group who looked somewhere between us racket smashers and the more sedate knight movers. This may have been because there was a preponderance of orientals among them, some still clad in the loose white outfits of the martial arts classes which took place in the same building. On the door, was an odd invitation, it said, "GO"

In the room, there was an mood of noticeable aggression and though I stood for some time trying to figure out the game, played on a board larger than chess and with "stones" resembling draughts pieces, I found it very confusing indeed. Pieces were taken but returned to the board. The board filled instead of emptied as in chess. Apparently taking pieces was not the object because howls of triumph rose which seemed to bear no connection with numbers of pieces captured.

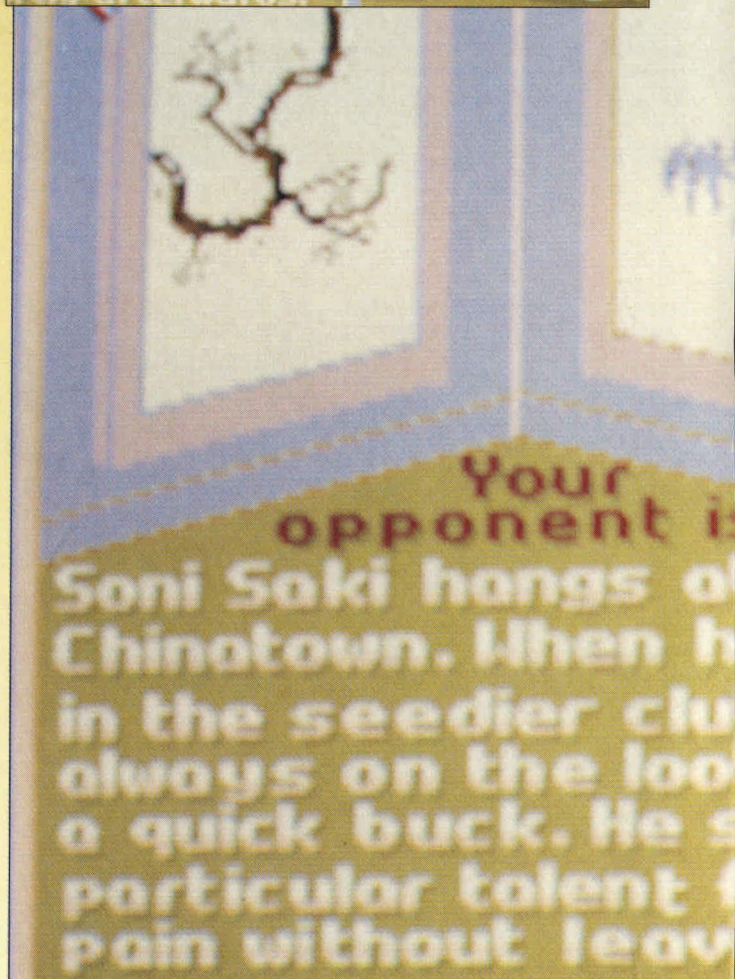
A subsequent visit brought me a little instruction from a Korean gentleman whose English was barely fluent enough to inform me that Koreans are the world's best players and that the game was the oldest board game in the world, and that it was about possession of territory and surrounding vacant areas of the board with your stones. Also, according to his example, victories could be celebrated by shouts and the fists in the air now familiar to us from TV football.

I learned no more then about the game for the next time I went, GO had gone and the eccentricities and club owner had departed too. The club became a Health Centre, the board game room was converted into a suntanning lounge and there was an influx of leotarded, aerobically fit girls...

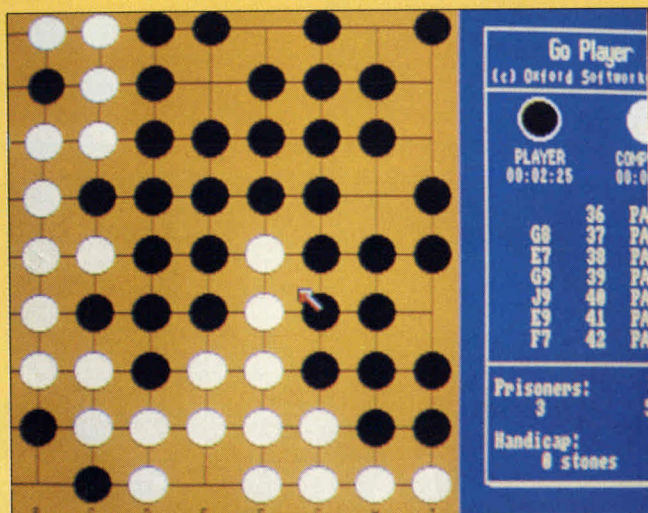
I was therefore delighted when Oxford Softworks "GO" program arrived on the Amiga, especially as it claims to be "The European GO Champion".

"GO" is supposed to be so difficult that no computer program has ever been created that could get anywhere near a good class human player. Needless to say, that inhibition does not apply to a computer playing me. A reasonable chess player, I stood no chance even at the lowest levels of this game.

GO represents the uninhabited world, bounded on all sides by the seashore. There are 19 vertical and 19 horizontal lines on the board forming 361 intersections or points. Beginning with an empty board, the players alternately place a stone, black or







white, on an empty intersection. The object is to enclose as much territory - vacant intersections - as possible by putting stones in strategic positions on the board. Once placed, a stone remains stationary until surrounded and captured. The game is finished when both players agree that neither can increase territory or number of prisoners.

After all the captured stones have been removed from the board, each player counts the number of points he has enclosed and deducts from the score the number of points lost as prisoners. The player with the highest points is the winner.

In my case, except for two games out of forty, the winner was always the computer, even at the lowest level of play. The game is a strategist's delight, offering so many variations that it demands constant attention and foresight. I think that it makes chess look easy and slow. Often, I was forced to use the helpful "Show last move" option to find out what the computer had done, though there is a slow and quick play option.

GO can be very addictive and, if you are as comprehensively thrashed as I was, both highly annoying and also very challenging.

The two games I won were, first, through giving myself an extreme advantage by setting up the start of the game with eight pieces already in good positions before the computer had one on the board and also getting the "Hint" option twice at vital stages. The "setting up" option is a very useful one.

The second win was achieved by playing the computer entirely with its own hints. I learned a lot through that game and was pleased to see that at the end of my forty games session, I was beginning to anticipate occasionally where the computer would place its stones. I was also down to placing only five stones on the board before the computer started and I was getting closer to it in scores.

One interesting point was that when I wanted to give myself too much of a start by placing eight stones on the board in the best positions, the computer seemed to refuse to play through the game. Quite an intelligent response...

This GO version is very simple for anyone wanting to start something new in board games and I must assume that if it is the European Champion, it is also good enough for a much higher class player too. It has what must be an almost unlimited variation of the levels of play.

I think it is a pity that this version does not come with an alternative to the computer, an option for two human players, but GO is structured to keep most individual players occupied for a very long or a very short time, whichever they prefer. If you have not tried GO, it is well worth experiencing. But beware, the whole game can develop a terrible fascination... Perhaps, in memory of the Korean gentleman and the eccentric club owner, I can get some of those girls to try it out in that suntanning room, capturing their territory could be very rewarding indeed...

A.M.

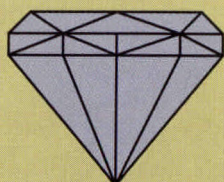
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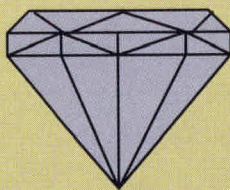


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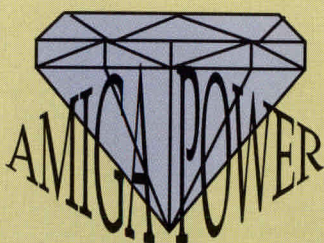
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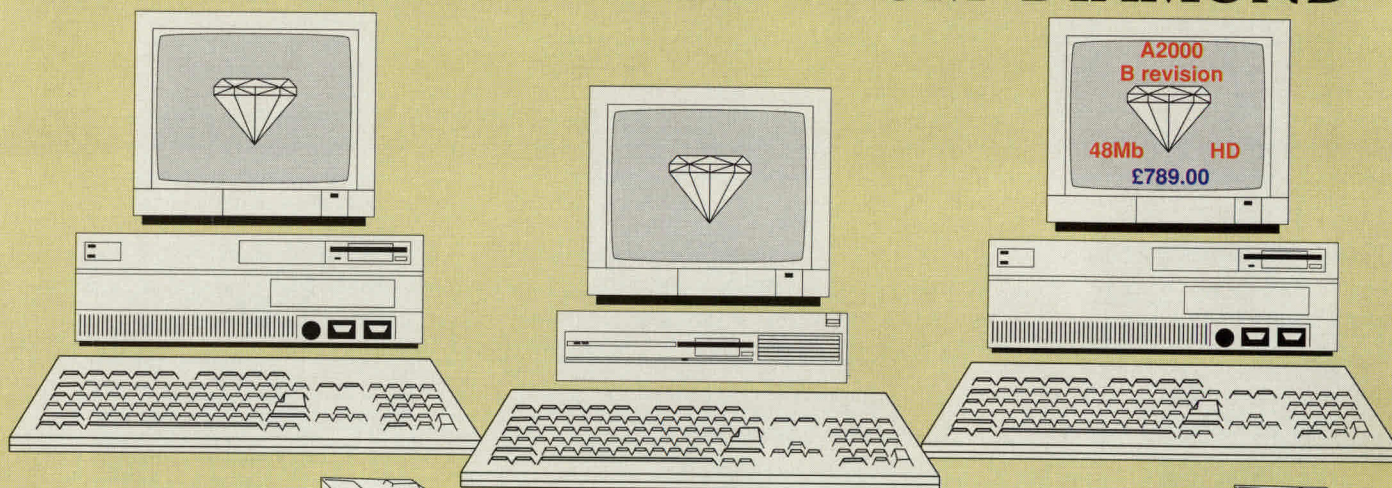
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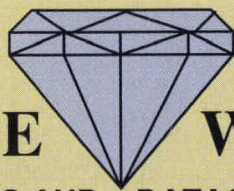
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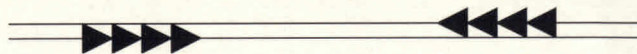
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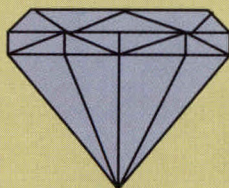
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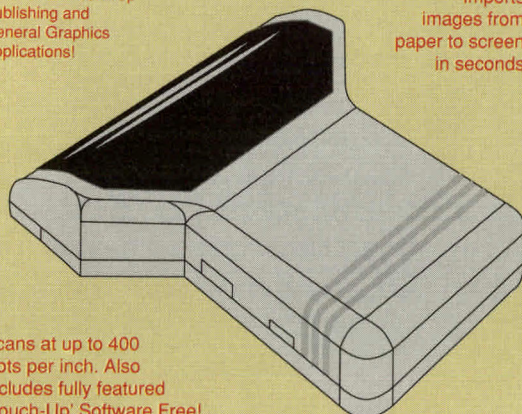


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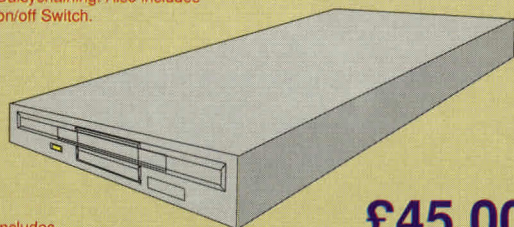
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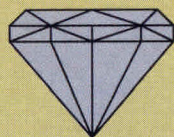
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# Genghis Khan

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**T**he legend of Genghis Khan (1155-1227) has been passed on generations after he unified the Mongolian states. It is somewhat fitting that a strategy game has finally emerged based on this barbaric great military strategist.

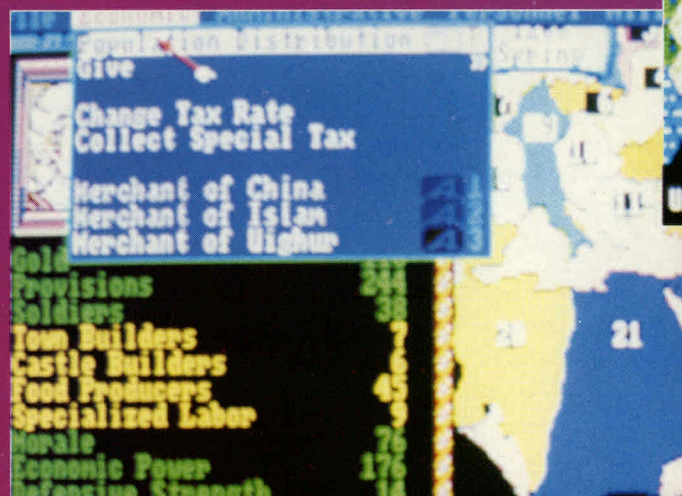
***"There are two scenarios to the game that are based on the same strategy control method, and allow up to four players"***

There are two scenarios to the game that are based on the same strategy control method, and allow up to four players. The first of these is a one player only game in which the aim is to unite the Mongol plains and become Genghis Khan. There are fourteen territories on the plains, each with its own ruler. Using acts of diplomacy, military power, and economic control Temujin - the young Genghis Khan - contrives to become the overall military leader by overcoming the other commanders and their territories.

The second scenario occurs after Temujin has become Genghis Khan, but is selectable even without playing the first, and up to four players can play. This time the players can choose between Genghis Khan (Mongol Empire), Richard I (England),

Alexious I (Byzantine Empire), and Minamoto Yoritomo (Japan) with the overall aim of world domination by conquering all of the twenty country states. Both scenarios offer the same gameplay and

*The game, irrespective of scenario, is played on a screen in a board-game manner. There is a display of the territories, a panel containing the state of the territory and other information as requested, a panel which displays messages from the computer, and pull-down menus which act as the control method for the game.*



the only differences are in the area maps and the multi-player option in the second scenario.

Three commands are issued per turn, with the computer playing the non-human commander's turn. With the use of the pull-down menus, the commander can enter into trade, change domestic policies, train soldiers, move provisions between states, spy on other territories, and negotiate terms with neighbouring states.

***"Soldiers cost money and provisions so a healthy economy must be established using labour and by trading with merchants."***

The game centres around the population of the state governed. There are soldiers, town builders, castle builders, food producers, and specialist labour. Each of these types of occupation provide the state with different attributes, normally at the end of the year. Soldiers are required to defend the state from attack and to mount offensives against other states. Town builders raise the economy and thus amount of gold collected. Castle builders will increase the defensive strength of



*When a state goes to war the battle is fought out in a special gridded map of the state being attacked or defended. The army is split into battalions of infantry, archers, and cavalry. The amount allocated to each is representative of the armies overall strength. Cavalry are the strongest type of battalion.*

**Graphics: 70% Sound: 72% Playability: 64%**  
**Absolute Value: 67% Price: £39.95**



	Richard I	Geoffrey	John	Hubbard
Age	48	45	38	28
Leadership	141	131	87	69
Judgement	142	125		
Planning	121	87		
Persuasive	146	88		
Physical	132	88		
Military	154	98	73	54

At the start of the game the ruler and governor candidates are given skill attributes. The skills can be trained (increased) as normal commands throughout the game, but are diminished or increased with bad or good decisions. The higher the skill of the commander the greater the chance of success.

the country, while food producers, and specialist labour increase the amount of food provisions and commodity items respectively. Soldiers cost money and provisions so a healthy economy must be established using labour and by trading with merchants.

When countries are aquired the ruler can appoint a governor from his candidates to rule, or command it directly. If a governor is appointed the computer will control the running of the state, but orders can still be given and policies made by the ruler. If a country is ruled directly only one command can be issued to that state per turn.

Genghis Khan is a numbers game. Like a business spreadsheet it is based on the control and distribution of numbers. The graphics aren't superb. The sound, although good, is better left off as it becomes irritating, and the gameplay, while entertaining to a strategist, is not administered in an economic manner i.e. when trading, it is necessary to access each trader individually, and the inventory of goods is on another pull-down menu. Overall, the game is for serious strategists and the game unfolds over many hours, rather than just a few.

P.K.



The best way to control a strong base is to enlist all of your subjects into your army early on. Then move about the plains to a state with high population. With such a formidable army, collecting gold and provisions from defeated states, it is possible to move anywhere. From your base you can set about attacking surrounding states using the same tactic.

# Warlords

## SSG/Electronic Arts

**W**arlords is a magical and mystical strategy game which brings the fabled Kingdom of Illuria within grasp. The aim of the game is to overthrow the seven enemy Warlords to become the unopposed tyrant of the land. There are, in total, eight races from Knights, Giants, Dwarves, Orcs, Elves, to Humans. Some of the races are good, others evil, but each wishes to become the overall rulers for their own reasons, and for that matter hate each other. The races can be either computer-controlled or human-controlled. The computer-controlled races have skill levels of knight, lord, and warlord, and the difficulty level of the game is changed by altering these settings, warlord being the toughest opponents.

The screen display is split into 5 sections which offer overall control and information to the game. There are pull-down

menus which offer the player access to actions which are not provided by the icon selection commands. These icons are the most used commands in the strategy. The two information screens display the local and overall status. Armies are shown, castles can be viewed, and an overall view of what other armies are up to are displayed.

The game is started with all sides given a home castle and a "hero", which is a powerful army capable of many tricks and tactics. The aim is to capture as many neutral castles as possible, and create armies and gain wealth from each of them. Later in the game fierce battles must be fought as the castles become heavily fortified with soldiers of the enemy.

Warlords is a mystical strategy set in a world of fabled races. Created by the Australian SSG development team who seem to have put a strong emphasis on artificial intelligence of the computer players, the game doesn't seem to gel as a great strategy, and although many D&D type wargamers will love this type of game, it is not a mainstream product. The graphics are, at best, described as appropriate for the setting, but not amazing, and sound likewise. I would certainly recommend a test drive before buying.

P.K.



**Graphics: 67% Sound: 56% Playability: 52%**  
**Absolute Value: 54% Price: £24.95**



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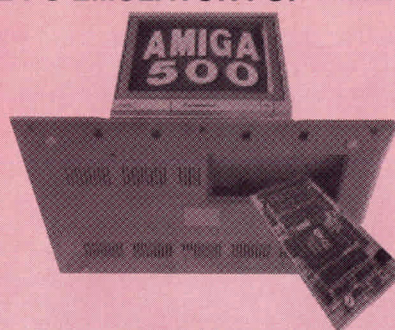
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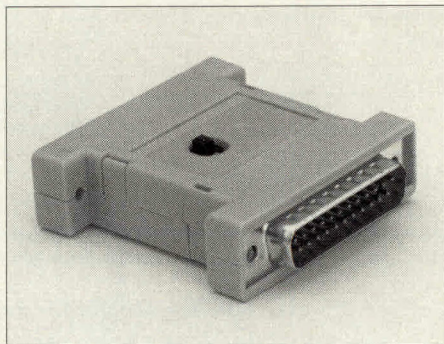
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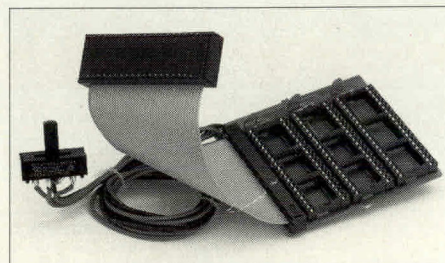
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# Battlestorm

## Titus

**Y**ou turn your back for a mere millennium, and what happens? Your home planet gets invaded by a conquering alien race. Gratefully, we've been spared a lengthy storyline, with unpronounceable alien names that spell the programmers' names backwards. Battlestorm is a pure shoot 'em up in the traditional mould, and claims to be nothing else.

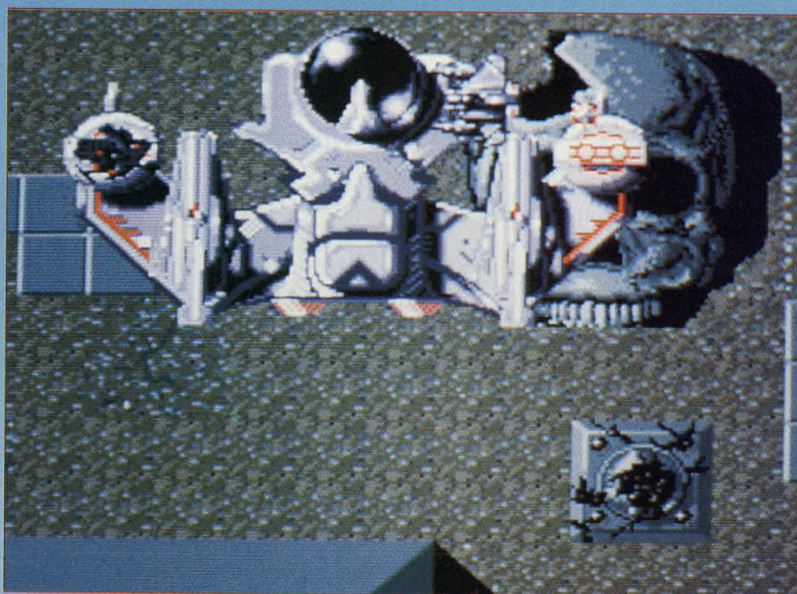
A choice of two control modes is on offer. One gives rotational control similar to that of Asteroids, while the other caters for those who prefer a simpler directional control. Once they're mastered, both methods allow a greater degree of accuracy than you could usually expect, mostly thanks to your ship's ability to fly in reverse whilst shooting forwards.

***"Battlestorm is a pure shoot 'em up in the traditional mould, and claims to be nothing else"***

You get eight levels of alien-melting action for your money. These are split into four two-part stages. The first part of each stage takes place over a multi-directionally scrolling backdrop. The easy option has been taken with the graphics. You don't actually get to see the aliens themselves. Instead, they swoop around in small spaceships, most taking the form of spinning balls or rockets.

With all the motherships on the current level destroyed, it's on to the vertically scrolling stage. The scroll direction is about the only difference here, with the alien-zapping continuing much as before. Another mothership later, it's back to the multi-directional scrolling with the first part of level two.

It's good to see a fast shoot 'em up with smooth scrolling, but



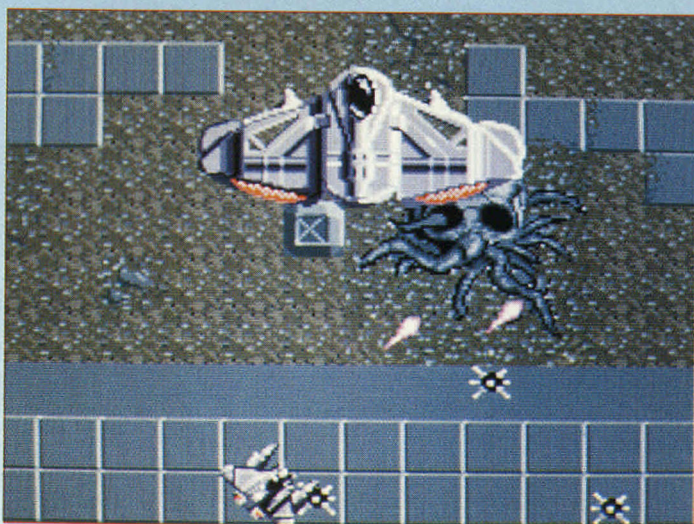
although Battlestorm scores highly on tech-specs, the design is dated. The past few years have seen a strong line-up of zappers appearing on the Amiga, with the likes of R-Type, Xenon II, Silkworm, and more recently Turricon II coming up with some great ideas. Battlestorm is very ordinary in all respects, from graphics, to sound, right through to the gameplay, which has nothing new on offer. In fact, it's very similar to a budget C64 game I remember reviewing almost five years ago, which was nothing to shout about even then.

***"Although Battlestorm scores highly on tech-specs, the design is dated"***

Battlestorm is neatly written, without any glaring flaws apart from the lack of imagination in the design. This wouldn't be a problem if it were selling for around £10, but full price software should offer a bit more than this. Zap-fans would do better to hunt down some of the aforementioned shoot 'em ups, most of which are available in re-released budget form.

By the way, our first review copy was a production copy, and was infected with the Byte Warrior virus. The replacement, also a production copy, was virus free. If you decide to buy Battlestorm, install a new bootblock to be on the safe side, and don't worry, it'll still boot and play as normal.

T.H.



**Graphics: 64% Sound: 59% Playability: 61%**  
**Absolute Value: 60% Price: £24.95**



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# Nightshift

## Lucasfilm Games

**A**fter a hard day's graft, booting up a game that simulates the sweat and grease of factory work might seem a strange idea. Then again, those Lucasfilm folk are strange people. Their games rarely conform, and nor does Nightshift.

It's a departure from their recent style of graphic adventures. Although it's a platform game, judging leaps from one ledge to another is the least of your concerns. Nightshift is one of those

the confusion. Along with all the little hiccups, you'll have to keep the factory free of pests, with the help of a modified Hoover and a semi-robotic venus flytrap.

***"Attempting to fix The Beast when you don't know what the hell is going can be quite a challenge"***

One thing the game does put across well, is the initial feeling of helplessness. Attempting to fix The Beast when you don't know what the hell is going can be quite a challenge. However, some of its other authenticities don't work in its favour. The "music" is a repetitive sequence of clanks and whooshes, that manages to wind you up even before you've got past the opening screens. The manual is devoid of any lower case "e"s, to give that dodgy typewriter look, making it a real effort to read. The preliminary screens and copy protection take an age to get through. One other niggle is that the game will only boot with the



"mental juggling" games, in which you have to multi-task your brain, concentrating and checking on a number of activities simultaneously. Anyone who's had a go at Lemmings will be familiar with the kind of mind-twisting test that's in store.

After seeing an ad in the paper, you take a job at the local toy factory. The position was for someone to look after the factory through the nightshift. All the toys in the factory are made by a machine that looks like it's been around since the industrial revolution. The Beast, as it's known, makes little dolls based on characters from Lucasfilm movies. The trouble is, it has a habit of breaking down about once every five seconds.

***"Nightshift is one of those "mental juggling" games, in which you have to multi-task your brain"***

Before each shift, you're given a quota of dolls, the minimum number you have to produce to keep your job. Details of the first few shifts are included in the instructions, highlighting the parts of The Beast that are most likely to malfunction.

The factory is seen as about three screens of vertically-scrolling machinery. Reversing conveyor belts, plugging in generators and flicking switches are common chores in the early stages. As you progress, more complex problems crop up, with one malfunction combining with another to add to



disk write-enabled. This is an unnecessary invitation to viruses, and could eventually be the cause of much frustration.

It's not all bad though. In fact, Nightshift can still be a very enjoyable game if you can put up with its imperfections. The idea is an interesting one, and it's been put together with a fair bit of humour. If you want an arcade game in which your brain gets more of a workout than your joystick, give it a shot. Anyone else on the lookout for something a bit different could do a lot worse.

T.H.

**Graphics: 72% Sound: 30% Playability: 72%**  
**Absolute Value: 70% Price: £24.95**



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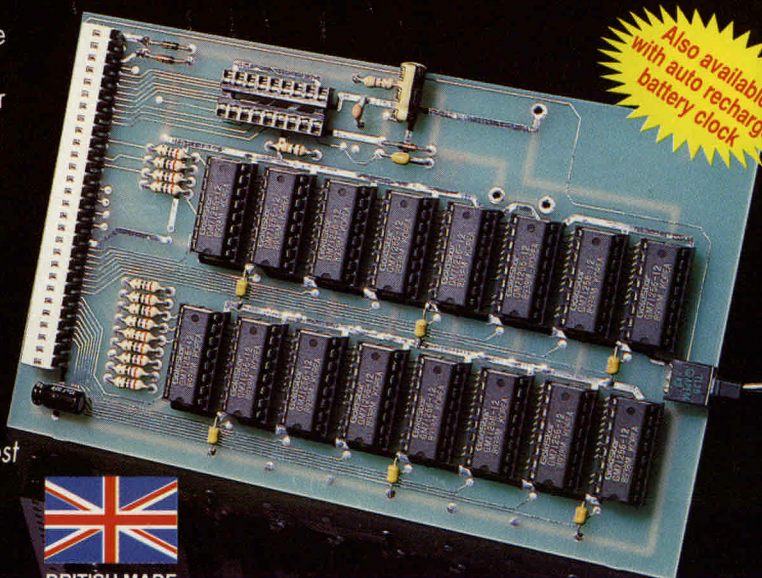
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# Wrath of the Demon

**Readysoft**

**B**est known for their Dragon's Lair games, Readysoft have carved themselves a reputation of a team that packs a punch with sound and graphics, but struggles to come up with gameplay to match. Unlike those interactive cartoons, Wrath of the Demon is a more traditional arcade adventure, inspired by Psygnosis' stunning Shadow of the Beast.

An evil demon has begun a campaign of death and destruction, which is soon to spread to your own land. The King has ordered you to defeat this fiend, so you immediately set out to slay the demon.

Stage one has you on horseback, galloping through green fields and picturesque mountains. Your horse lacks discipline, and insists on bolting at high speed from left to right. As you fly along the multi-plane parallax scrolling backdrop, your life is threatened by a number of hazards. Crates, rocks and logs will trip your horse, so a well-timed leap is called for if you spot an obstruction. Ghouls and mini-demons swoop across the screen from time to time. You can choose to duck underneath them, or punch them. Some disintegrate when hit, others just carry on their way, and some zap you of your energy. Potions left on the road can be picked up for extra energy, shields and "smart bombs". This is an infuriatingly difficult first level,

***"In your attempt to escape from the two-way scrolling cave, you come across a number of monsters, ranging from beautifully grotesque to irritatingly blob-like."***

demanding the reactions of a fly and the patience of a saint. Here's a tip: continually tap the pause key on and off, to give yourself warning of what's coming up.

Fortunately you can save your position between each level, so once you've cleared the first, you won't have to sit through it again. Your horse abandons you for scene two, which takes place on a single screen. A couple of goblins attack, one hiding in the corner throwing rocks, the other trying to beat you to a pulp. A bit of precise swordplay sorts them out.

Next you come up against a giant blue dragon in a similar single-screen battle. Cute and stupid as he is, you have no choice but to poke his belly with your sword until he disappears in bloodless fairy tale-style. Now you get to one of the more blatantly Beast-like levels. In your attempt to escape from the two-way scrolling cave, you come across a number of monsters, ranging from beautifully grotesque to irritatingly blob-like. The animation frames as you turn around look very attractive, but they slow down the control response, adding some unnecessary frustration.

The game comes on four disks, and despite all the massive graphics, it runs on a half meg machine. Some of



the sprites are superbly animated. The big blue dragon for example, is nothing short of stunning. Musician David Whittaker's brief seems to have been to come up with some more Shadow of the Beast tunes, which is just what he's done. They're all very professionally put together, but very familiar.

Wrath of the Demon is almost a brilliant game. It's let down in places by frustrating gameplay oversights. However, the promise of more monsters and surprises in later levels will be enough to keep many adventurers plugging away to the end. It's a shame more of the motivation to play doesn't come from the fun of the game itself. Some will love it, others will hate it, and a few will sit on the fence. Me? I quite like it, in short bursts.

**T.H.**

**Graphics: 95% Sound: 87% Playability: 78%**  
**Absolute Value: 79% Price: £24.95**



# Team Suzuki

## Gremlin

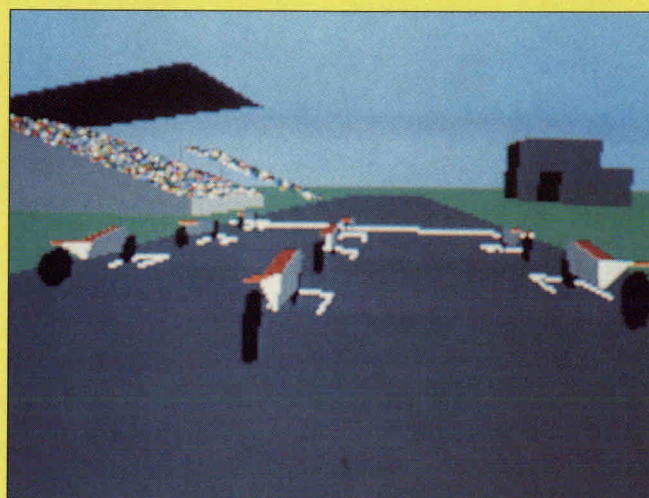
**T**hey like their motor racing up at Gremlin. Team Suzuki is the latest in a series of racing games from the Sheffield crew, and there are still more on the way. This time, with bikes, they've gone for a simulation slant. As we all know, in order to qualify as a simulation, a program needs either loads of essential keyboard controls, or 3D vector graphics. Team Suzuki goes for the vector graphics, choosing to reserve keyboard controls for optional viewpoint changes.

To say all your favourite circuits from around the world are here wouldn't be true, unless you favour some of the less glamorous international tracks. A good test of realism for any racing game is to choose a circuit you know well, and see how it shapes up to the real thing. I often use Brands Hatch as a benchmark, but if you want a British track, you'll have to make do with Donington Park. Still, it could be worse, you could be stuck with Birmingham City Centre.

***"A good test of realism for any racing game is to choose a circuit you know well, and see how it shapes up to the real thing."***

You get all the usual options, allowing you to practice a track, take part in a single race, or set out for a whole season. There's also the choice of three bikes. The smaller bikes are easier to handle, but are slower than the big monsters which have the opposite characteristics.

The view used for most of the game is from the seat of the bike, looking over the handlebars. As you turn, the horizon tilts with you. It can be difficult to get used to, but this tilting horizon effect works quite well. Even the smallest bike is very cumbersome at low speeds, so getting a clean start if you're behind a few others on the grid is almost impossible. As is the case with most race games, you're left floundering while the pack



racers round the first bend.

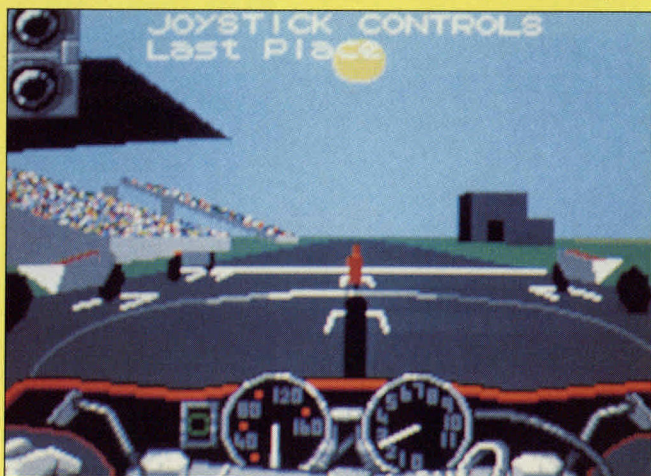
It's the bends that let the game down. On the straights, you can see far enough ahead to keep on top of things. Once you get to a bend, all you see is about ten feet of tarmac making a sharp exit off one side of the screen. If you happen to be approaching a tight chicane or a double hairpin, the layout of the track only unfolds as you career onto the verge. Of course, you can get to know the circuit with a few practice laps, but it's rather unrealistic to be unable to see more than 10 feet around the bend. You might think the exterior views would cure this tunnel vision, but it's nearly impossible to find a viewpoint that isn't worse still.

***"As you turn, the horizon tilts with you. It can be difficult to get used to, but this tilting horizon effect works quite well."***

This problem doesn't completely ruin the game, and it's hard to see how it could have been avoided without changing the game substantially. With the riders made invisible, the game runs fairly quickly, averaging around 10 frames per second. The sound fails to generate a big race atmosphere. The engine drones rather than roars, the packed grandstands are silent, and there's not so much as a squeak from the tyres.

I don't want to lay into the game too heavily, as it's still fairly playable. The trouble is, it doesn't manage to draw you into the action in the way that the likes of Indy 500 and Stunt Car Racer do. Worth a try out, but there are superior alternatives.

**T.H.**



**Graphics: 78% Sound: 40% Playability: 69%  
Absolute Value: 70% Price: £24.95**



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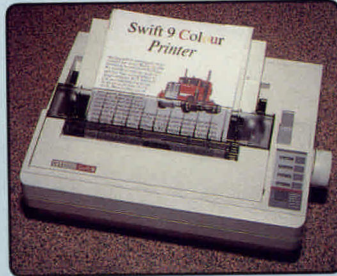
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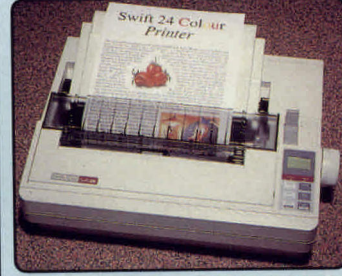
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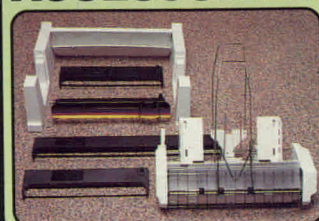
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# Ski or Die

## Electronic Arts

**S**kate or Die was one of the best sport simulations ever written for the Commodore 64, and unsurprisingly, was created by some of the original Epyx team, but sadly, it never appeared on the Amiga. The sequel has been around for the PC for some time, and has now been converted to our favourite machine.

Expecting Ski or Die to live up to its predecessor may be asking a bit much. Sequels tend to either expand and develop the original ideas, or milk them. Ski or Die veers towards the latter.

The format is identical to that of Skate or Die, with five events that can practised individually, or compiled to make a kind of mini-Olympiad. In place of an options screen, Rodney's ski shop acts as the centre of the game. From here you can view the hi-scores, sign up for a competition, or choose to practice an event. So far so good, but it's the events themselves that make or break the game.

First up is the snowboard halfpipe. This takes place in a long, straight gully, viewed from behind the skier in 3D. Psycho bunnies with chainsaws complicate matters, as you attempt to pull off tricks on the edges of the gully. Points are awarded for

moves including hand-plants, ollies, rail-slides and various other skate-originated tricks, including that old fave, the McTwist.

Strong influences from Atari's Toobin are evident in the rather uneventful innertube thrash. It's a downhill race in which you swap skis for an innertube, and attempt to bump your opponent off course and beat him to the finish line.

***"Make sure you land on your feet though; a face plant doesn't do much for your overall score."***

The highlight of the game comes with the acro-ariels. Presented and controlled in a very similar fashion to the hot-dogging of Winter Games, it's an exaggerated simulation of skiing's most dangerous variation. A touch of stick waggling builds your speed, before you fly skyward, and do your best to impress the judges with a combination of spins, flips and tweaks. Make sure you land on your feet though; a face plant doesn't do much for your overall score.

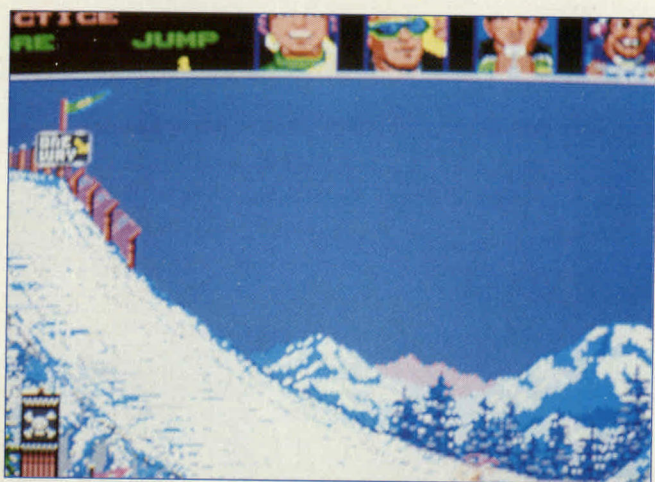
The downhill blitz is a simplified version of the downhill from Skate or Die, with an irritating oversight concerning the control method, which doesn't acknowledge diagonals. Finally there's the snowball blast, which breaks away from the style of the previous events. It's really Operation Wolf with snowballs and a sense of humour, but can get tedious before long.

***"In the same way that we see games ported from the Atari ST, games from the US seem to be suffering from a similar situation, in which the ST is replaced by the PC."***

We used to get state-of-the-art graphics and programming, with well-worked gameplans from this lot. In the same way that we see games ported from the Atari ST, games from the US seem to be suffering from a similar situation, in which the ST is replaced by the PC. It looks as if much of the original PC game has been recycled for the Amiga version, and as a result, Ski or Die is rather unadventurous. In general, the events are merely cut-down versions of those seen in Skate or Die, with the addition of snow and skis. It's not a disaster, but could, and should have been a lot better.

T.H.

**Graphics: 67% Sound: 55% Playability: 69%**  
**Absolute Value: 68% Price: £24.95**





# BACKGAMMON ROYALE

FROM OXFORD SOFTWARES.  
(IN ENGLISH, FRENCH AND GERMAN)

**B**ackgammon (known as Tric-trac in France and Puff in Germany) has been played for thousands of years in all parts of the world, and now you can pit your skills against Sons Serif or Dimitri Duzo (on behalf of the computer) as Oxford Softworks brings you the game on the

Amiga (and the PC).

The object of the game is for the player to move his 15 men (called Blots) into the inner table on his own side of the board, and then "bear" them off the board.

This is achieved by moving across the board according to the fate of the dice.

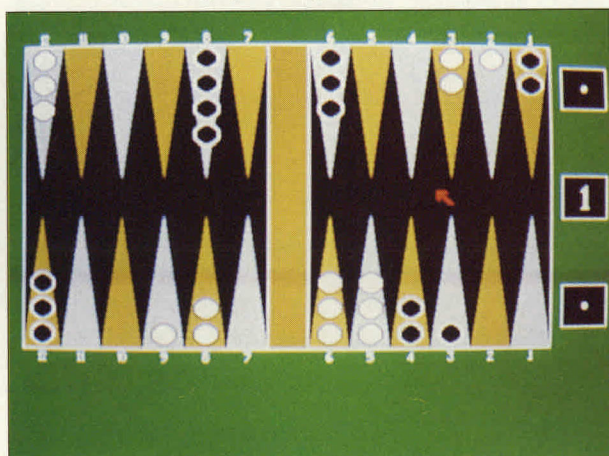
The Oxford Softworks Backgammon rolls the two dice, the upper one for you and the lower for itself. Additionally there is a 'Doubling' dice. Backgammon is played for an agreed base stake which may be increased by doubling during play. If the first dice rolling gives a double, the stake of the game is doubled and the dice are rolled again.

You have the ability to control the style of the computer's play by using the 'Aggressive' and 'De-

fensive' settings. After the first game you also have the opportunity to 'set the dice' for the first throw. Thereafter you are in Sons' or Dimitri's hands - as far as the roll of the dice is concerned - and judging by the inordinate amount of doubles that the computer got compared to mine, they obviously have a better grasp of the 'cheat' option!

For players who have not tried Backgammon, this is certainly a very accessible entry into one of the most famous gambling games in the world - a much better amusement than solitaire for example. For those Backgammon enthusiasts who haven't a ready and willing partner on hand to play, this program provides a stimulating and challenging game. It is a pity, however that Oxford Softworks did not find it possible to choose to provide the option to let you play against another humanoid, and leave Dimitri and Sons to their other pursuits!

M.W.



## COMPETITION

## GO And Never Be Board Again!

The two board games, Go and Backgammon Royale, are published by Oxford Softworks, a division of CP Software. Both of these fascinating games are reviewed in this very issue of *AUI* and as a special treat Oxford Softworks are offering 10 copies of each game as prizes. That's 20 games for the lucky winners.

All you have to do is answer the following simple questions:

1. Who are supposed to be the world's best GO players?
2. How many intersections, or points, are there on a GO board?
3. How many players does a Backgammon game have?

*Send your entries on a postcard by no later than 31st May 1991 to:*  
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Maxwell Specialist Magazines,  
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### RULES

The Editor's decision is final. Prize winners will be drawn from a hat containing correct entries. No cash alternative can be offered for prizes. No employee of participating companies or Maxwell Specialist Magazines are eligible to enter.

Closing date for entries is the 30th May 1991.



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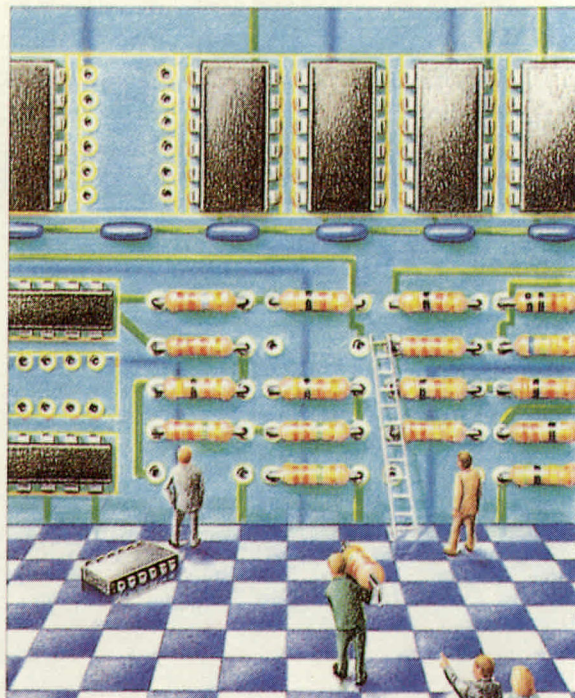
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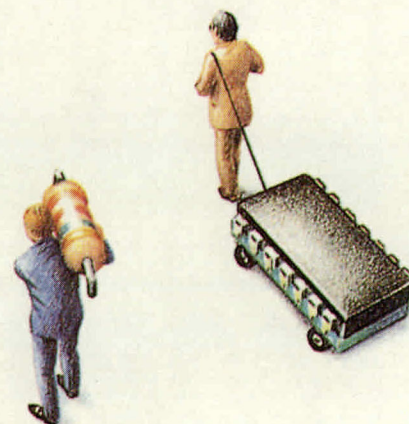
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All New Star Trek	(2) - Super graphics
Harv Laser's Top 20	(4) - 20 of the best
Megademo	(5) - All kinds of demos
Something for Nothing	(2) - 15 Video and graphics tools
Games	(1) - 7 Top games
Mandelmania	(2) - 9 Mandelbrot set
Toolkit	(5) - Massive tools and utils set
Deskbench	(3) - 1.3 Workbench with icon system
Fontlib	(1) - 48 Fonts - icon selectable
Animation Demos	(5) - 16 Animations (need 1mg memory)

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# ADVENTURE NOW!

**WITH THE GULF CONFLICT STILL VERY MUCH ON OUR MINDS, IT IS UNCANNY TO THINK THAT ALL THOSE BATTLE GAMES LIKE GUNSHIP, INTERCEPTOR, BOMBER AND F19 HAVE SUDDENLY ALMOST BECOME TOO REAL TO CONTEMPLATE.**

**O**n TV screens in front of our eyes, are pictures of war action that is no computer game, those make believe scenarios are make believe no longer. The armchair viewer has in the space of two months become such an expert in all forms of military hardware, that one could probably have a discussion about just what ammo the Tornado can carry and in what quantity - and at whom it should be aimed or even sold to...

So it would seem likely that the computer war game market is a good bet for a boom in new products, two of which have landed on my desk this month. None, I hasten to add using the recent hostilities as subject matter, (although I am sure they will not be long in coming). No, these examples concentrate on ancient history with GENGHIS KHAN from Infogrammes and look to the future with Accolade's STAR CONTROL. Thrown in for good measure is a really superb role player from Ubisoft entitled B.A.T. and Readysoft's DRAGONS LAIR II. But before all that, it's the news.....

## SIERRA UK A REALITY

Your hero was invited to a grand opening bash of Sierra's new British offices where amongst all the bubbly and grub, all the latest games were on show and the new computerised help line unveiled.

In attendance for Sierra was Rick Cavin, Vice President Sales and Operations, and Srini Vasan, Director International Business. I saw the PC version of KINGS QUEST V in all its glory with stereo sound boards and hundreds of colours, and SPACE QUEST IV. Well, at least some of it as it hasn't been finished yet! The main news I have to tell you is that Sierra are currently employing their own dedicated Amiga programmers and artists to convert their new games instead of just porting the code across from PC as they are currently doing. This will, of course, improve the sound, look and speed of their games

considerably.

The HELP LINE and BBS (Bulletin Board Service) have now been installed and are up and running. These can be accessed either by 300/1200/2400 baud MODEM on 0734-304227 or by touchtone push button phone 24 hours on 0734-304004. The system is fully automated and can handle up to 10 calls at the same time.

## INFOGRAMMES BUNDLE

The French aristocrats have bundled together SIM CITY and POPULOUS in one box to retail at £29.99. Now that is what I call value!

And talking about good value....

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## GREMLIN GET HEROIC

If you are like me, you are also an avid board game player, and one of my favourite games is Heroes Quest by MB. The game has reportedly sold over 200,000 units since launch, and has been a primary cause of increased interest in role playing games for the masses. Well, Gremlin have acquired the license to produce the computer game version possibly in time for Easter (this year?) and are backing it with a big budget TV ad campaign.

## PALACE GET ADVENTUROUS

Palace are better known for arcade games like Barbarian using the voluptu-

ous Maria Whittaker as a teaser on the box cover. However, news is filtering in of a text/picture project called DEMONIAK, written by Chris Stangroom who had quite a say in the design of Lord Of The Rings. Particularly the changing from one character to another, the 'becoming' command. Demoniak contains 'becoming' in a big way, along with a thing called a Character Control Language, which basically allows for over fifty computer characters to live within the game. The game itself is about a nasty piece of work called Demoniak who lives in a far off galaxy in Dimension X. He has decided that after conquering most of the Universe he wants a piece of ours. You play the whole team of super heroes including Doc Cortex who is out to save mankind in the only way you know how... Watch this space for a review.

## ADVENTURE REVIEWS

### DRAGONS LAIR II:

**TIME WARP Readysoft/Empire £44.95**

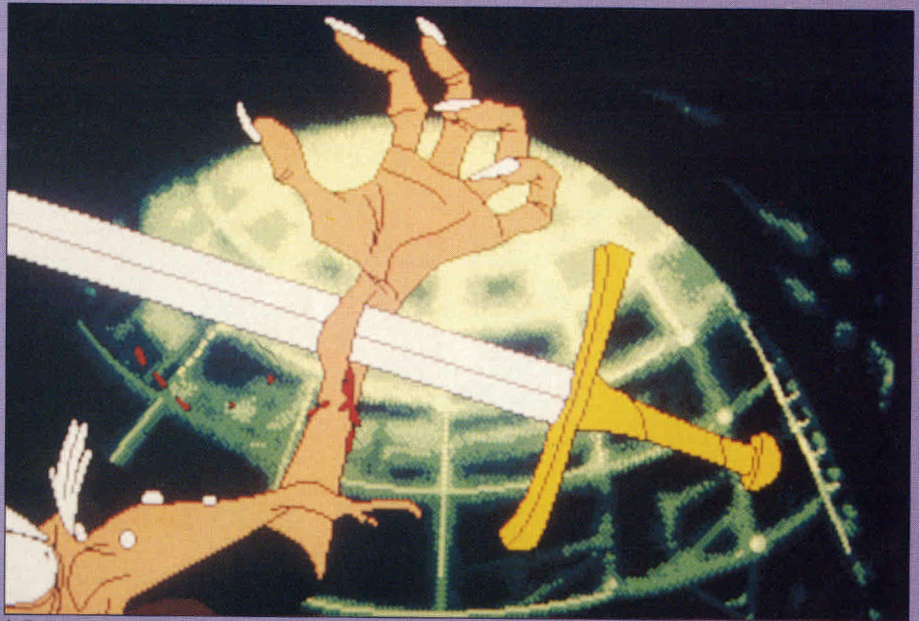
Yes, Dirk is back from his exploits with Singe, but having slain the dragon, he is faced with an even more dangerous foe... his Mother-in-Law! Princess Daphne (No, not the AUI book reviewer of the sacred Moss clan!) has been kidnapped by the wicked Mordroc who has hidden her in a wrinkle in time. Threatened with pulverization by his Mother-In-Law's rolling pin, Dirk has to brave all manner of perils in order to rescue his beloved. But he must hurry, because once the Casket of Doom has been opened Mordroc will place the Death Ring on Daphne's finger in marriage, and she will be lost forever.

For those of you who are familiar with these Don Bluth graphic masterpieces, the game's the same, the sound is better and the speed deviously difficult. For the uninitiated, an animated scene is played showing Dirk (the Hero) in a very precarious situation. You must try to work out

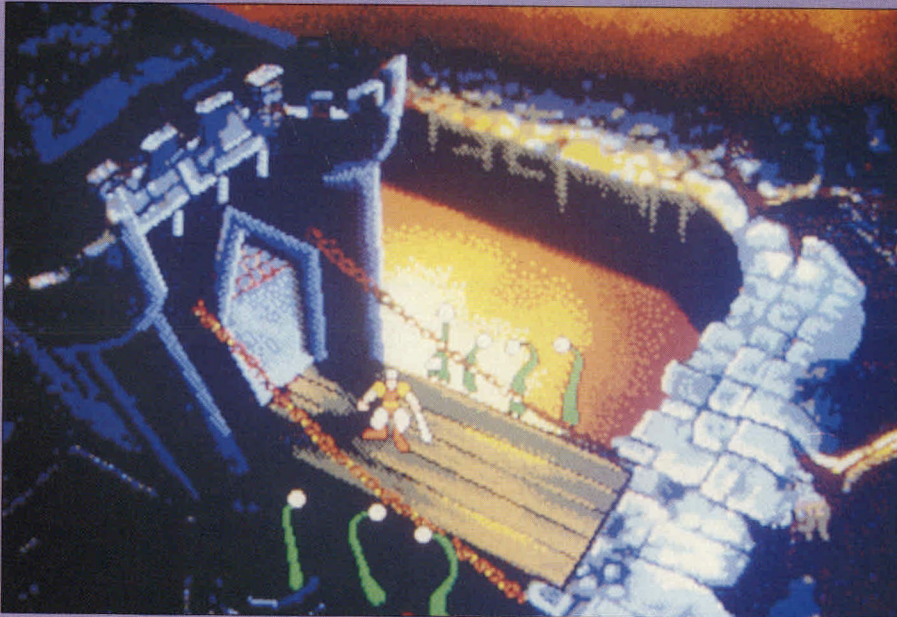


precisely what is required of Dirk as far as movement is concerned by moving the joystick up, down, left or right, or using his sword. Each scene normally has about three actions to perform but all in a split second of timing. Get it wrong and you kill off one of your three lives. Get it right and you continue on to the next scene. The graphics are outstandingly brilliant cartoon animation, and the sound is all sampled perfectly, and the speed is breathtaking. The drawbacks are the price, a hefty forty five pounds, the shallow and limited gameplay, as the only skill you need to complete the game is sheer perseverance and an accurate and responsive joystick.

**GRAPHICS 95%**  
**SOUND 95%**  
**OVERALL 60%**



↑ *Dragons Lair*



↑ *Star Control*

## STAR CONTROL

**Accolade £29.95**

After hitting the heights with B.A.T I am brought right back down to earth with a thump with STAR CONTROL which for me is a perfect example of American marketing hype at its worst. A beautifully presented box with such exciting statements on it as 'Sense the unmatched dimension and drama of space', and 'stunning graphics' or even 'engaging strategy, furious space combat'. What a load of tosh. The only thing that is furious about the combat is the player when he realises what a let down the whole thing is.

Behind all the hype is a simple game of the 'Asteroids' genre, only replace the asteroid part with another spaceship and you have it. These two spacecraft whizz around the galaxy (and yes some of the backdrop planets are pretty) trying to shoot the other into oblivion. Wrapped around that core is a sort of strategy game that has you as the Alliance Of Free Stars battling against the Ur-Quan Hierachy for control of the galaxy. You get 14 ships from which to choose, but to be honest unless the two ships get very close to each other, whereupon the screen changes to a close up, all you see are two diminutive sprites shooting across the screen.

This is a major disappointment from a company that has always had my support for its quality output. One to forget.

**GRAPHICS 60%**  
**PLAYABILITY 20%**  
**OVERALL 10%**





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## B.A.T

Ubisoft £24.95

This is a wonderful role playing adventure more than two years in the waiting. BAT stands for the Bureau of Astral Troubleshooters, and as one of their best agents, based on Terrapolis you are summoned for a new mission. Vrangor, a brilliant but mad scientist and Merigo a small time hoodlum have announced their intention to detonate huge bombs in Terrapolis, the largest city on Selenia. The ultimatum, leaves the government only ten days to evacuate the city and turn it over to the madman. The planet is in mortal danger, the countdown has begun and it is up to you to foil Vrangors evil plans.

The game is played out on over 110 gloriously drawn static screens that have bits of animation in them. What makes this game entirely different from any other game of this genre is that the cursor works very hard. In fact the cursor is the key to controlling the game. Using the mouse, you move the cursor around the screen picture, and depending upon which part of the screen you are on, the cursor will change to a particular icon that represents what you can do at that point. If it is a possible direction to move, for example, the icon will be an arrow pointing in the direction of the exit. If it is a place where you can drink something then it will change to a bottle. If it changes to a speech bubble it means you are near a person with whom you can communicate, and if you

come across a machine or need to accomplish a specific action then it will change to an upright pointer. Clever huh? This system of dynamic icon control lets you concentrate entirely on the game whilst giving you direct immediate information. The cursor also generates sub menus for the usual Look, Search, Help, Drop, Eat commands etc that are displayed in pull down windows in screen.

The structure of the game is based on a 'distributed adventure' format, that allows you to reach a solution in various ways. The creators describe the adventure as having a 'main backbone' composed of branches and knots. The branches can be parallel or concurrent, they converge to

electro-organic technology which means it is a separate organ of your body. It allows you to monitor information about your body, but, moreover, lets you modify some of your physical and mental characteristics. For instance you can program it (and I mean just that, write a mini program) to translate robot and alien languages, (because until you do you won't understand anything they say) increase your heartbeat before a battle (extra energy) warn you of hunger or thirst, in fact anything that you think you will need to survive. This is a revolutionary concept in computer gaming, and one that deserves great credit.

You can create your own character, or use the predefined stats that are present at the start of the game. There is literally so much scope in the game that cannot be written about here because of space restrictions, but you explore the vast city, go underground (mapping is needed) play 'Bizzy' a memory game for money, get romantic in the sleazy hot spots of vice downtown, navigate a desert vehicle and do battle with many nasties on your quest. This is a true mega game of obvious quality and amazing depth that simply must be seen and played to death. A fantastic achievement.

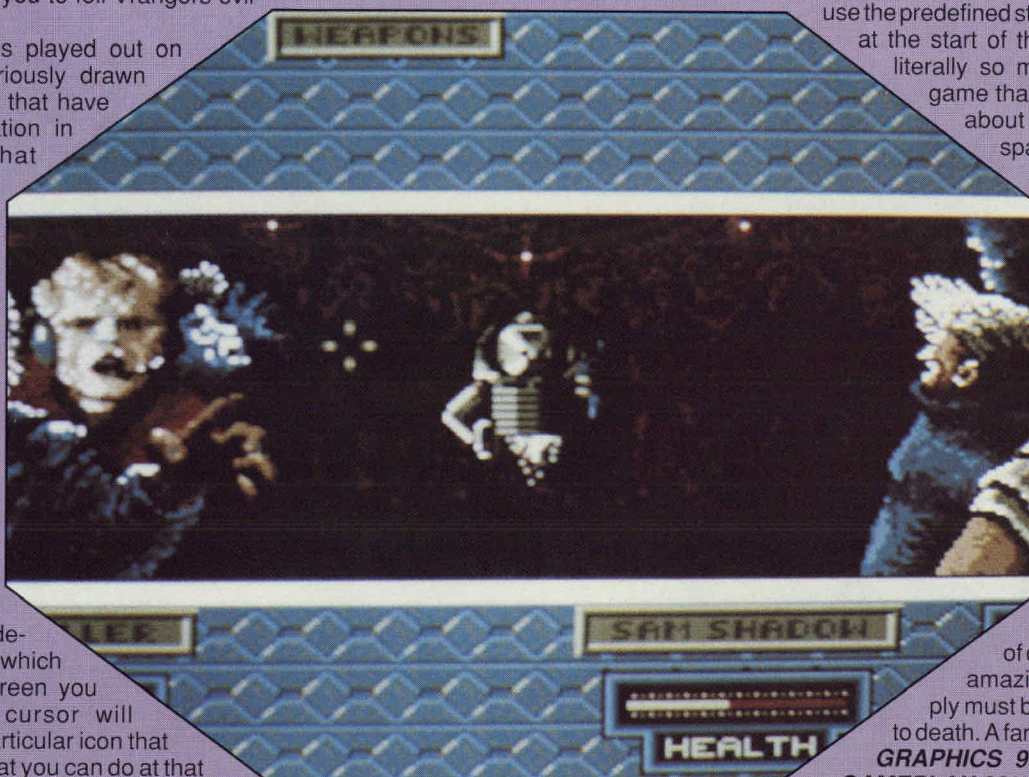
GRAPHICS 99%

GAMEPLAY 99%

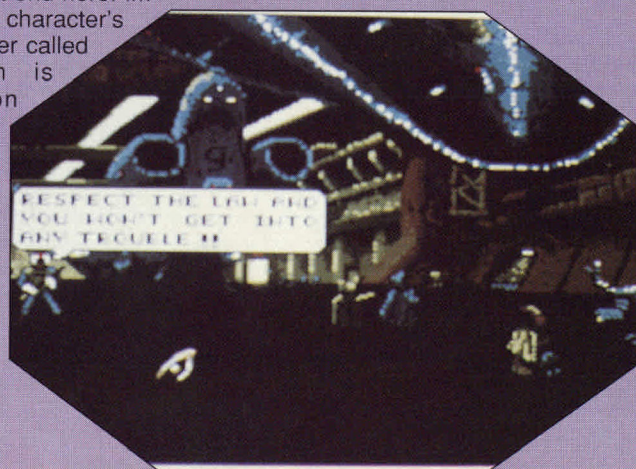
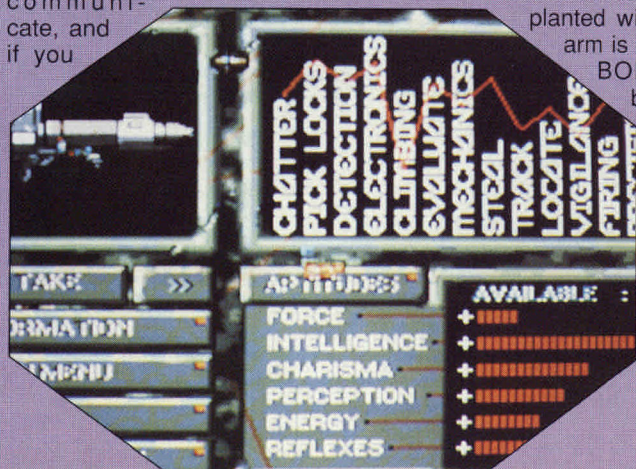
OVERALL 99%

A.M.

THAT'S IT FOR THIS MONTH. LOOK OUT NEXT ISSUE FOR A FULL REVIEW OF SIERRA'S COLONELS BEQUEST, AND SOME MORE HELP TIPS.



wards the knots which lead to the next step in the story by logical relations. In essence, you are free to wander around the world at your own pace because eventually you will follow a lead which will allow you to progress further. And this advanced format does not end here. Implanted within your character's arm is a computer called BOB which is based on





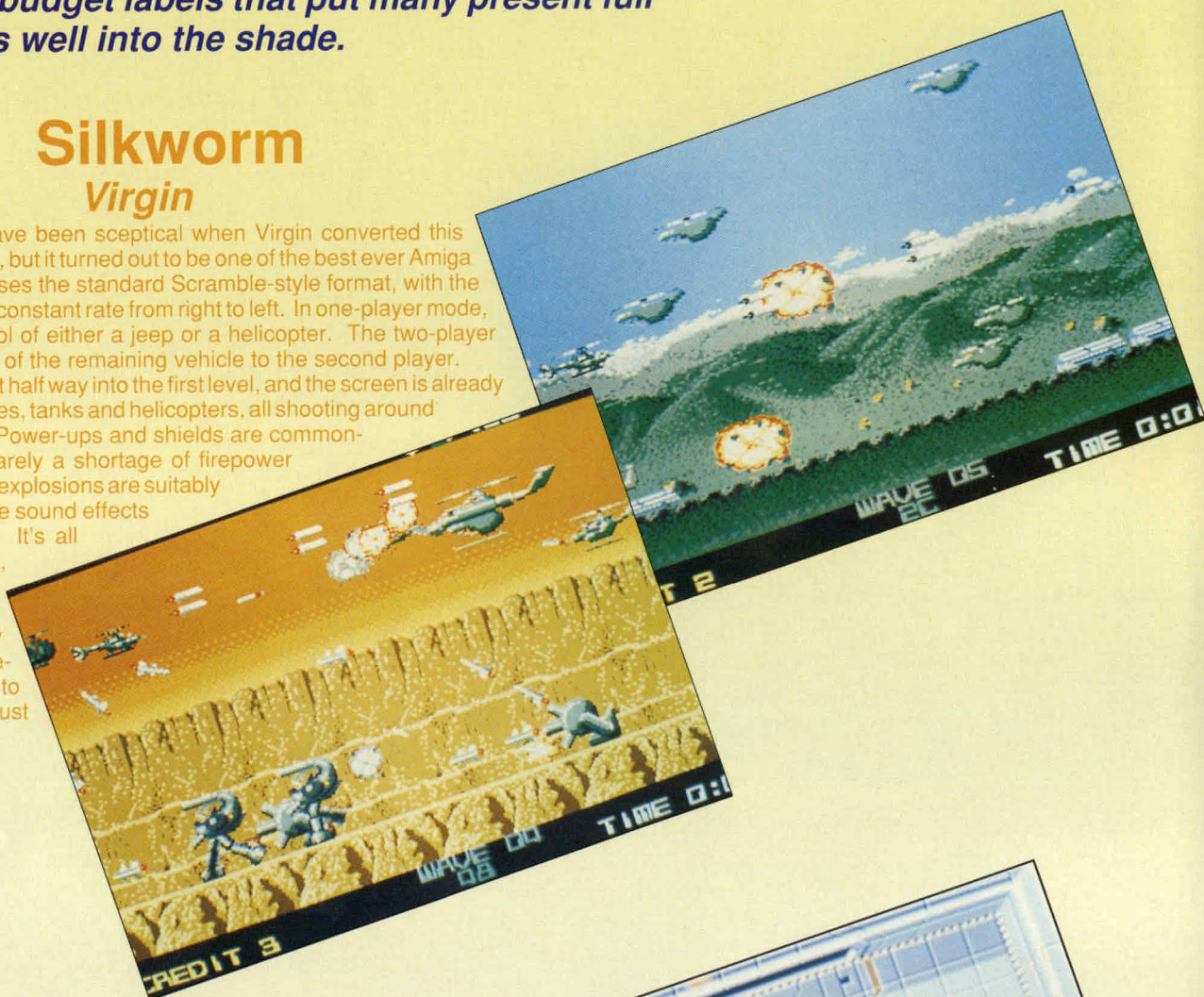
# Short Reports

**Tony Horgan reports on four hits of a superior class now out on budget labels that put many present full price games well into the shade.**

## Silkworm Virgin

On-lookers may have been sceptical when Virgin converted this little-known coin-op, but it turned out to be one of the best ever Amiga shoot 'em ups. It uses the standard Scramble-style format, with the levels scrolling at a constant rate from right to left. In one-player mode, you can take control of either a jeep or a helicopter. The two-player mode gives control of the remaining vehicle to the second player. You only need to get half way into the first level, and the screen is already full of missiles, planes, tanks and helicopters, all shooting around at a hell of a rate. Power-ups and shields are commonplace, so there's rarely a shortage of firepower from your end. The explosions are suitably spectacular, and the sound effects are just as meaty. It's all completely smooth, and overall is an improvement on the coin-op, mainly thanks to its slight re-scaling of sprites to backgrounds. A must for all zap fans.

**Rating: 92%**  
**Price: £7.99**

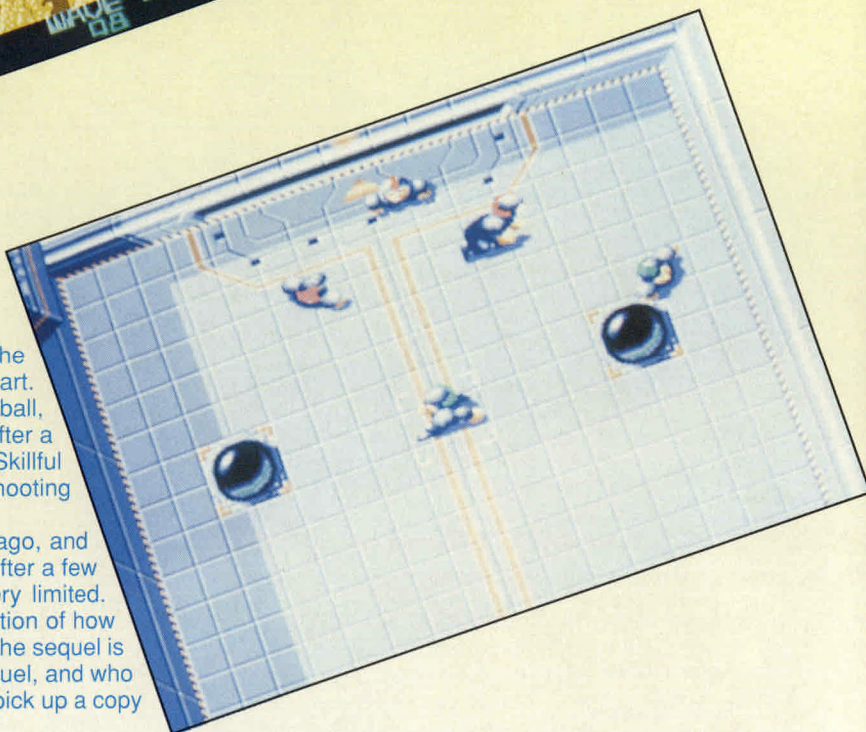


## Speedball Mirror Image

The sequel is one of this month's biggest sellers, and now the original game looks set to make a re-entry into the chart. Speedball is a future sport hybrid of football and basketball, with all the foul rules taken out. Stoppages only occur after a goal has been scored, and even then, they're pretty brief. Skillful tackling is replaced by brute force, but accurate passing, shooting and speed are still vital.

It went down very well on its initial launch some years ago, and remained a favourite for a while afterwards. However, after a few games with the sequel, Speedball seems slow and very limited. That's not so much a criticism of Speedball, but a reflection of how much more advanced the sequel is. Anyone who owns the sequel is likely to find little of interest here. Those without the sequel, and who have no intention of buying it in future, would do well to pick up a copy of Speedball at the reduced price.

**Rating: 84%**  
**Price: £9.95**





## Super Hang-On

### *The Hit Squad*

Three years of 3D racing games have attempted to better Super Hang-On, but for pure Outrun-style arcade race action, there's still nothing to top it. The coin-op technology in the original arcade machine was fairly simple by today's standards, which has worked in the game's advantage. Thanks to some excellent programming, the Amiga version is almost as fast and smooth as the original, and possibly even more playable!

It's a simple race along a winding road, which is split into sections by checkpoints. Fail to make the next checkpoint before the clock runs down, and you're out of the race. You get the choice of four tracks, each increasing in length and difficulty. Boredom from lack of variety is not a problem, as the stages take you through deserts, pastures, saltlakes and many other colourful locations. There's also a few night stages, so stock up on the carrots. The graphics are some of the fastest you'll see in a 3D game, and the gameplay will have race fans glued to their sweaty sticks for some heavy sessions. It's no one-week-wonder either; we're still playing it with just as much enthusiasm as the day it was released. Get a copy now.

**Rating: 95%**

**Price: £7.99**



## Rocket Ranger

### *Mirror Image*

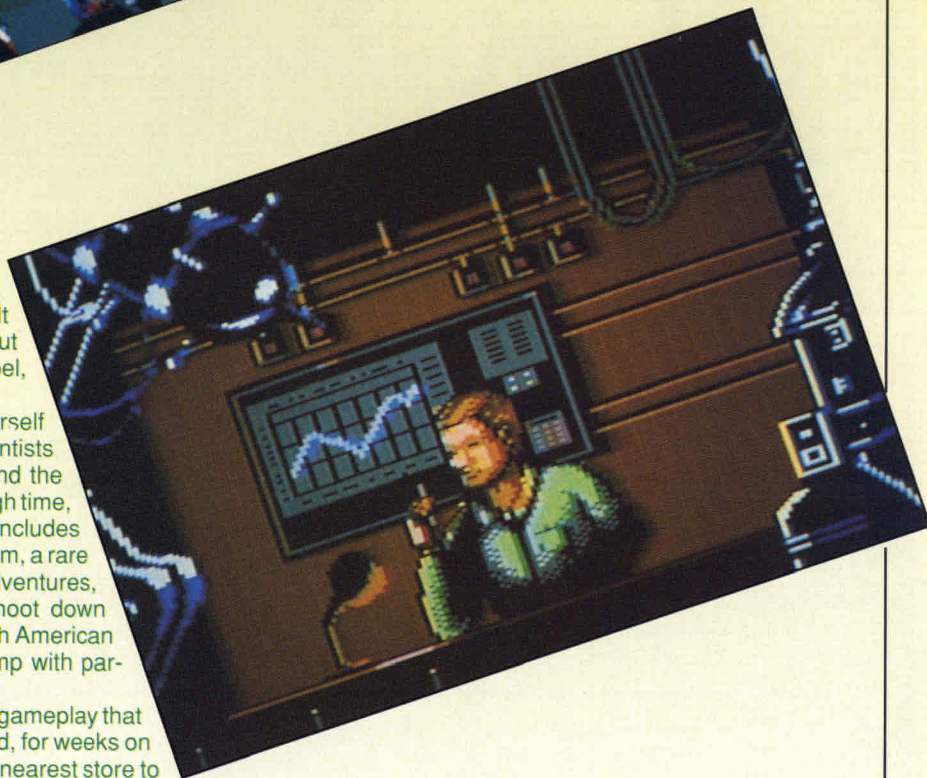
Designed and programmed by Cinemaware, Rocket Ranger is another of their own interactive movies. It was first released in 1988, priced at £30. Now it's out for a third of the price on Mirrorsoft's new budget label, so there's no excuse to be without a copy.

Playing the part of Commander Cody, you find yourself transformed into Rocket Ranger by a bunch of scientists from the future. The Nazis won World War II, and the scientists have sent you this equipment back through time, hoping you'll be able to foil Hitler's plans. Your kit includes a jet-pack, a ray gun, and a limited supply of lunarium, a rare rocket fuel found only on the moon. On your adventures, you'll have punch-ups with German soldiers, shoot down fighter planes, seek out Nazi fortresses in the South American jungle, fly Zeppelin's across the Atlantic, and romp with partially-clothed girls on the moon!

Rocket Ranger is a treat for the eyes and ears, with gameplay that will keep you riveted to your Amiga for hours on end, for weeks on end. At the price it's a steal. Don't walk, run to the nearest store to buy it!

**Rating: 97%**

**Price: £9.95**

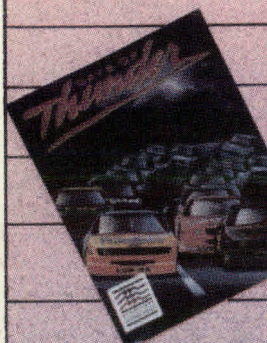
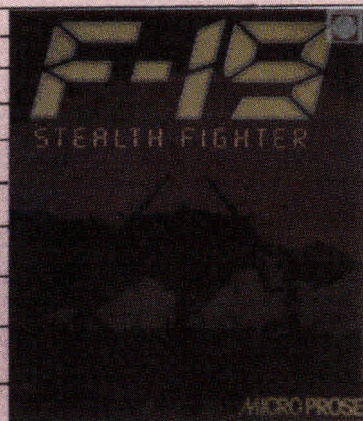
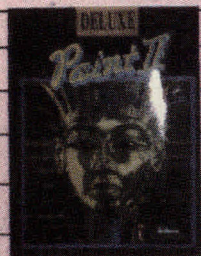




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# U.K. GAMES CHART

Game	Company	Last Month	Rating	Price
1. Powermonger	Electronic Arts	(1)	82%	£29.95
2. Speedball II	Imageworks	(-)	91%	£24.95
3. F-19 Stealth Fighter	Microprose	(5)	78%	£29.99
4. Lemmings	Psygnosis	(-)	100%	£24.99
5. Turrigan II	Anco/Rainbow Arts	(-)	90%	£24.95
6. Indy 500	Electronic Arts	(2)	93%	£24.95
7. Final Whistle	Anco	(4)	97%	£12.99
8. Golden Axe	Virgin	(3)	73%	£24.95
9. Mig-29 Fulcrum	Domark	(-)	86%	£34.95
10. Teenage Mutant Hero Turtles	Imageworks	(-)	30%	£24.95

Well, it wasn't too difficult to predict – as we did last month – that Speedball and Lemmings would hit the Charts this month – and they are still rising. It's a quiet time but, we hear, those Lemmings are selling like crazy. A great game. . . Anil Gupta's Turrigan II too.

## Recommended Games of the past three months

*Each month we review a whole pile of games; some awful, some good, occasionally some terrific. Some of the best never even get into the charts. In this new section we recommend games which have been the best in the past few months to keep you updated*

*when you part with your hard-earned cash. There is so much hype around, our un-biased and analytical approach should be a good guide on what to buy. Games we recommend have to be worth every penny – You can believe that.*

**Lemmings**  
**Psygnosis**  
**£24.99**

**AUI Rating: 100%**

If you only ever buy one game in your life it's got to be Lemmings. Lemmings is based on a race of simple creatures who will walk into Psygnosis' death traps. Using various skills which you can bestow upon these Walkers you can prevent them from dying and save the Lemming race. It's new, and addictive, with four different game difficulties from fun to mayhem. You'll not find another like it.

**Harpoon (1 Meg only)**  
**Mirrorsoft**  
**£29.99**

**AUI Rating: 94%**

For lovers of strategical warfare, especially naval, this simulation from the States is an accurate presentation of current military strategies. Several missions are available to you, as commander of a task force either on the side of NATO or the Soviet Union. There are several "realism" settings which allow for easier, or harder, gameplay. The developers are also creating data disks with different scenarios and missions.

**Indy 500**  
**Electronic Arts**  
**Price: £24.95**  
**AUI Rating: 93%**

EA's simulation of America's Indianapolis 500 race combines a high level of technical detail, with spectacular fast-moving gameplay. Solid 3D graphics are used to portray the cars, track, pitlane and grandstands from just about any viewpoint you choose. Despite the highly detailed graphics, it's one of the fastest race games around, deserving the attention of all boy-racers.

**Prince of Persia**  
**Broderbund**  
**Price: £24.95**  
**AUI Rating: 92%**

A brilliant arcade adventure from the creators of Loderunner, Wings of Fury and Choplifter, Prince of Persia is one of the most compulsive games released for months. What at first seems to be a mundane and graphically dull game is uplifted by some superb character animation and devious level designs. Don't be deceived by its unexciting look in still shots. Get a copy ASAP.

**Speedball 2**  
**Image Works**

**Price: £24.95**  
**AUI Rating: 91%**

Spikes, rivets, balls and helmets may all sound a bit kinky, but sex fiends will be disappointed to find that Speedball 2 is a violent future-sport. Steel-plated arenas are the venues for this barbaric variation on indoor soccer. Setting new standards in graphics, with top-notch sound effects and gameplay, Speedball 2 is a bare essential for armchair sportsmen.

**Turrigan 2**  
**Rainbow Arts**  
**Price: £24.95**  
**AUI Rating: 90%**

Turrigan is a robot on a mission. His mission: to seek out and destroy The Machine, which has enslaved the land, bringing destruction and death to its inhabitants. His minions have overrun the land, swarming the caverns and canyons, with guardians placed at strategical points. Your upgradable laser, bounce bombs, plasma bolts and ability to change into an indestructible spiked ball will all help you in your task. Graphics and sound are both top-notch, with superb scrolling, massive level guardians, loads of big weapons and a fair bit of variety. The best shoot 'em up released in a very long time.



# IVS Trumpcard500

**No more "Insert Workbench in any drive" messages, exalts John Kennedy and advises you to get into the 'scoozie' world . . .**

If there is one peripheral which will transform your Amiga like no other, it's a hard disk. I know you are probably sick of hearing this, but if you have never used one before, the incredible difference it will make to your system is hard to explain. Let me put it like this:

Imagine that every day for the past ten years you have had to walk five miles to work. Think about it: Every day, five miles there and five miles back. And twice at lunchtime too.

steal to get it back. Once you have experienced the power and speed of a hard disk, life is never the same again.

Ok, so there are drawbacks to buying a hard disk. And the drawback to end all drawbacks is "Like a hard drive costs real money, man." But, you will find it worth every penny.

## The Real World

There are quite a few hard drives avail-

able for the A500, but only about three which would appeal to the mass market - if there is such a thing as a mass market for hard drives - by being almost affordable.

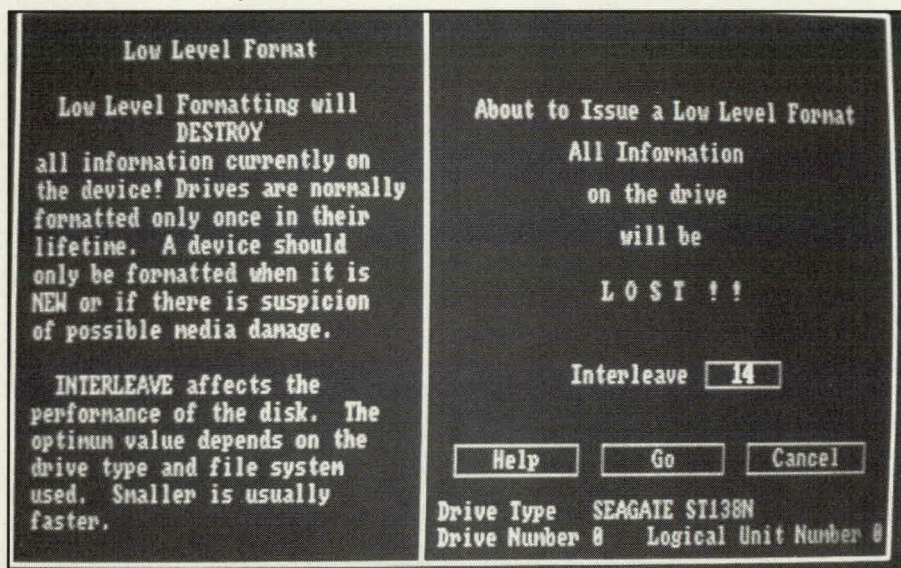
These drives are the official Commodore A590, the GVP Series 2 and the IVS Trumpcard 500. The Trumpcard fills a nice gap: It has more storage than either and is priced somewhere in the middle.

## Jargon Time

If you are into hard drives and/or computer jargon you'll have come across the acronym SCSI. It stands for Small Computer Systems Interface and is usually pronounced 'scuzzy' or ('scoozie' if you're me).

SCSI is an accepted standard which - unlike many other standards - actually works. If you connect any SCSI device to an Amiga with a SCSI interface all you need is the right software and you're home and dry.

I must admit that I never actually believed this, until I connected a bog-standard Apple Macintosh hard drive to an Amiga 2000 with a SCSI interface fitted. To my utter astonishment, the drive worked perfectly. This opens the door to all sorts of amazing hardware. Such as 600Mb removable optical drives, scan-



Imagine also that suddenly, overnight even, your office suddenly shifts to the house next door. Now, to get to work you just open your front door, jump over the fence and your there. Wouldn't that be nice?

Now you're starting to get the idea. Imagine an Amiga that never, ever asked you to swap disks. No more "Insert Workbench in any drive" messages. Think of your Amiga only taking fifteen seconds to load its Workbench. Wouldn't it be nice?

When you plug a hard disk into your Amiga, you have a new computer. It's not just better, it's different.

Take my advice: If anyone ever offers to lend you a hard disk for a week, don't take it. Once you have used your Amiga with a hard disk, you'll never be able to go back to floppies again. You'll beg, borrow or

Trump1 (above) is the utility software which comes with the hard drive.

***"If anyone ever offers to lend you a hard disk for a week, don't take it. Once you have used your Amiga with a hard disk, you'll never be able to go back to floppies again"***



ners, plotters and, of course, the in-vogue CD-ROM drives.

The IVS Trumpcard is a SCSI controlled drive, and so somewhere inside the drive casing is a full set of SCSI control and data signals, just waiting for you to connect your next purchase. It would have been nice if they had been brought out to the blanking panel at the rear, but let's be honest here: most users will be lucky to be



able to afford a hard drive in the first place, never mind any extras. Still, it's nice to know that should the need arise you haven't backed into a corner when it comes to expansion.

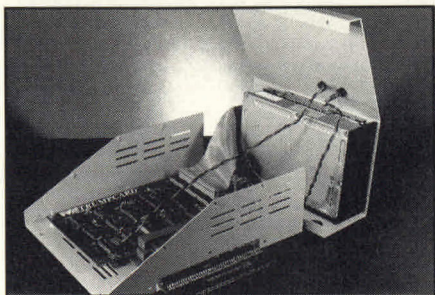
Another nice point is the edge connector available inside the casing. It's here that the optional 2 and 4Mb ram expansion cards fit, a space that funds permitting I would like to have occupied before too long. Furthermore, if you outgrow the ST-125N-0 hard drive mechanism fitted, you could plug in a bigger drive. Just like that. Aren't standards wonderful?

## In Use

Connecting the Trumpcard to an Amiga 500 couldn't be simpler. You just pop out the little plastic cover on the left of the casing (yes, that's what it's for) and plug in the drive. Then you switch on your computer and it boots up (assuming you have Kickstart 1.3, which all Amiga's bought in the past few years will). It's so simple I'd almost let my mother have a go. It connects snugly to a Checkmate digital A1500 expansion box too, only needing something to support it a little (such as an old mousemat).

There is no external power supply, although provision has been made for one if you think you need it. Normally I'm paranoid about Commodore power supplies, but I've used the Amiga, the hard drive, two floppies and a video digitiser all at once with no problems. If I had more than 1Mb of ram expansion though, I'd definitely hook up a new power supply. No point asking for trouble, and hooking up a separate one for the drive is simply a matter of changing the position of some internal jumpers.

The drive housing is made from a pressed steel sheet and is painted in the now obligatory shade of beige: White with a hint of Commodore. It's not entirely pleasing to the eye, but has a certain air of functionality about it. Reminds me of a Volkswagen for some reason.



In use, it's a doddle. You know it's there because you can hear it whirring away. You soon ignore the noise, and are only reminded of its presence once every couple of minutes when the drive is "tickled". It makes a little ticking noise as the read/write head is given a gentle reminder not to doze off.

My Trumpcard came pre-formatted which meant that all I had to do was copy

all my programs onto it. I duplicated the EMPTY drawer a dozen times, renaming them with exciting titles such as "WORDPROCESSOR", "ART", "PROGRAMMING", "INFOCOM" and then dragged all the icons across from floppy disks. It's a rare occurrence when a floppy is ever inserted, other than to stop the drives from clicking or for a backup.

***"Connecting the Trumpcard to an Amiga 500 couldn't be simpler. You just pop out the little plastic cover on the left of the casing and plug in the drive"***

Backing up is something that you'll soon get to know all about when you have a hard drive. After using one for even a short time, you'll find that you have collected a great deal of vital information. But more than that: your hard disk becomes your 'personal' computer. Everyone has a definite way of setting things set up: the

they aren't indestructible.

I've been using the Trumpcard for several months now without any problems at all, but I know that some day I may face a disaster.

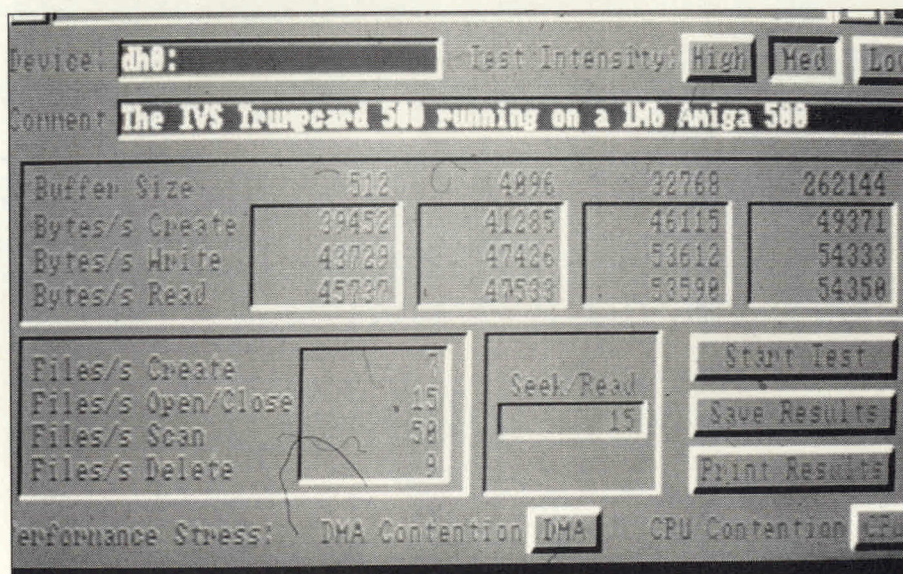
Perhaps my younger brother will accidentally delete my prized collection of anatomical bitmaps. Perhaps one of my more experimental C programs will amok. I don't know what will happen, but I know I'm ready for it.

In fact, with a hard drive storing so much data, a utility program such as SID is almost a necessity. SID will allow you to move around, copying and deleting files much faster than from either the CLI or the Workbench. It should be one of the first programs you install.

A floppy disk containing a suite of utility programs is supplied,

but the chances are you'll never need them. If your drive needs to be formatted, a rather cunning program on the floppy will do it all for you. You don't need to wear an anorak to be able to use this hard drive.

**Trump2 (below) is the results of DiskPerf3, currently the best disk tester.**



choice of workbench colours; your amusingly shaped pointer; the way in which drawers are organised; your favourite utility programs; in other words the sort of thing which makes a workbench your own. If all that goes, you have a dreadful feeling of having to start all over again from scratch.

That's why backups are so vital.

There are several commercial programs around designed specifically to make backups, and if you are lucky, your Trumpcard will come with one. You just run the program, and it will save any changes made to your files since the last time you used it. In this way, your backup can take only a minute or two to make each week. Time well spent, because sometime, somewhere you'll need it.

Modern hard drives are reliable, but

## The Final Word

Do you really need a hard drive? If you use your Amiga for anything other than a games console, then yes - you really need one. It's all but essential if you program, draw, animate, raytrace, word process, DTV or DTP. I've used the Trumpcard for all these tasks, and it has never let me down.

Do you need this hard drive? Again, you probably do. It's just about the right size for 'domestic' use and it has good expansion capabilities. Consider it seriously when you decide it's time for your Amiga to become a real computer.

**J.K.**

**Price: From £399.99**

**Contact: Third Coast Technologies**

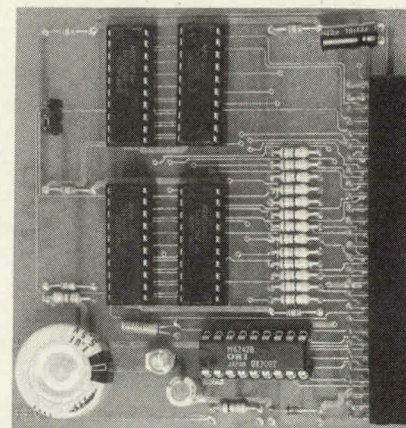
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# The Great Mouse Guide

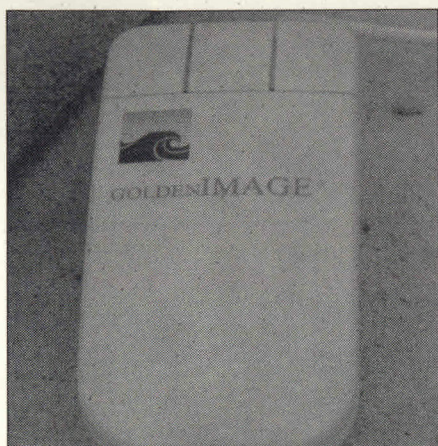
**Computer Rodents! Is there a difference between them? Pat Kelly plays Pied-Piper and gathers up many of the mice currently available occurring through the market...**

**C**hoosing a replacement mouse for your micro is fraught with complexity. For around £25 you may think that you can't go wrong, and after all, a mouse is only a mouse, isn't it? Well, not exactly. There are suppliers out there who will spend good size advertising budgets to convince you that their mouse is the best, and offers more functions and technical achievements than any of its competitors.

Confusing us more, many mice are designed and manufactured in the Far-East, sold in bulk to individual suppliers and badged with their logo. The mouse will not be exclusive to the supplier, and you may find that two different companies can be selling the same mouse under different badges (names).

The point is that you can't trust advertising all of the time, and you should try to test drive your prospective mouse as you would a new car. It may be the best design, but it may not suit you. It may offer the highest technical achievements, but it may not function to your requirements. Then again, it may be sluggish and horridly put together, but it may be just what you want - especially in price!

The guide below is not definitive to what is on sale or available, but it is reasonably indicative of those mice which are available.



## GI-6000 Optical Mouse

This mouse works optically on a special gridded mouse mat, instead of the more standard rolling ball opto-mechanical method. It uses light to deflect rays from the mat and thus calculates direction and speed of movement. As it needs no ball it is less prone to break down, however if the mat is lost or damaged the mouse is

useless. We reviewed this mouse in the February '91 issue of **AUI** and found it to be very light in weight.

It is great for those who like very sensitive handling, but overall it does not perform better than opto-mechanical units.

**Price: £56.00**

**Contact: Golden Image**

**Tel: 081-518-7373**



## Cordless Mouse

Although it comes from the USA we dis-

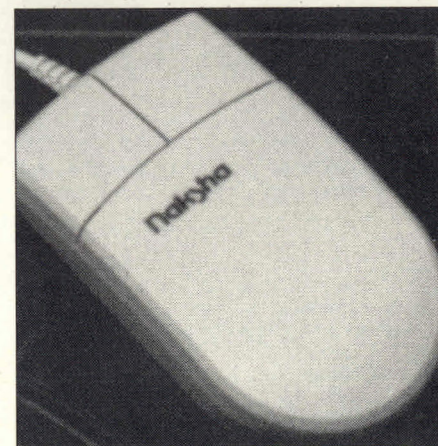
covered this mouse in Germany, at the Cologne Amiga '90 Show, and gave it a favourable review in December 90's edition of **AUI**. Its main feature is that it operates using infra-red signals to a receiver which is plugged into the mouse port. It is more responsive than the Commodore Amiga mouse at about 220dpi and has a battery life of about 6 weeks of heavy duty computing.

It is also very well-designed and is comfortable to use. If you are troubled by your mouse cable getting in the way of your peripherals then this is the mouse for you.

**Price: £49.95**

**Contact: Pulsar**

**Tel: (0221)87 33 59**



## Naksha

A few years ago a mouse appeared on the market. This mouse set new standards in the way mice would look and operate. It was known universally as the Naksha Mouse!

Time has passed and unfortunately so too has the original Naksha mouse only to be replaced by a slightly bulkier, but less-expensive relative.

A new design was implemented, but



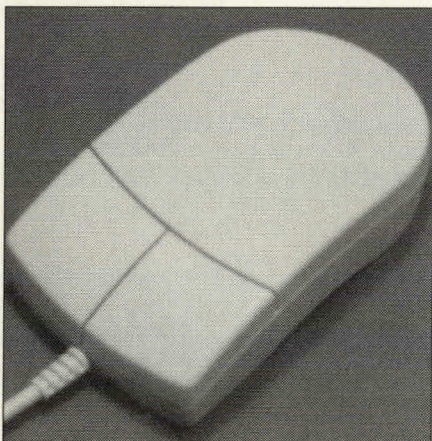
instead of only upgrading the internal workings the external shell was also re-designed. This re-design gave the Naksha a larger shell, slightly larger buttons, and an Amiga/ST switch which avoided the need for an adaptor lead. The unit became only slightly larger, but enough to make it feel different, although the superb operational quality was maintained. Naksha have also recently reduced its price to compete with other mouse suppliers.

Although some £10 less expensive than its predecessor the new Naksha mouse is supplied with the Naksha mouse pad, a no-quibble 2-year guarantee, a mouse pocket, and currently a £5 off voucher for Electronic Arts games. I have replaced a Naksha mouse before, under guarantee, and can vouch for the good service given.

**Price: £28.95**

**Contact: Naksha UK Ltd.**

**Tel: 0925 56398**



## That's A Mouse

This mouse has been made to compete directly with the Naksha, and so it should because it is almost the same mouse! The mouse is made in the Far-East and several are sold as un-badged products.

What appears to have happened is that this mouse is a slightly redesigned version of the Naksha, or visa-versa, but the supplier is claiming that it has Naksha internals.

That's A Mouse! differs from the Naksha in exterior design only - it has a larger shell and more of a humped-back, and is lower in price, but with the omission of the Naksha mouse pad, the no quibble guarantee and mouse pocket make the Naksha a better buy for the little difference in price.

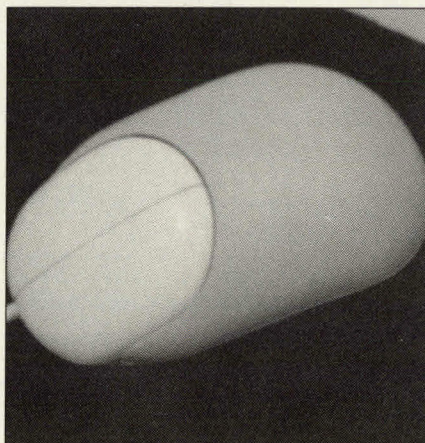
**Price: £24.95**

**Contact: Compo Software**

**Tel: 480 891819**

## Beetle Mouse

Available in various single or dual tone colours including black, red, yellow, blue, grey, and white, the Beetle mouse is named after its shapely resemblance to the creatures - and not the popstars. The



mouse is small, rounded - more so than any other mouse, has an amazing 320dpi resolution, and is supplied with a foam mouse mat. It is relatively new and no doubt will gain as many followers as critics. There is no denying the Beetle's superb performance and distinctive shape which offers good support to the hand. However, it was found that with prolonged use it became slightly uncomfortable.

The designers have also done away with the normal lead-weighted smooth roller ball and have opted for a lightweight anti-static black ball which has a rougher surface. This "rough" surface does not affect the mouse's performance and does away with the idea of the ball having a smooth surface.

The mouse is produced to a cheap'n'cheerful standard, but the design and performance certainly challenge the others.

**Price: £29.95**

**Contact: Gasteiner Technologies**

**Tel: 081-365-1151**



## DAATAmouse

Like the Beetle Mouse the DAATAmouse is "ergonomically designed" to support the user's hand. This it does well in a GUI environment due to its arched shape which is smooth from front to back. However, it is quite sharp from side to side and when operating the mouse as an ancillary to the keyboard, such as with a wordprocessor or database, I found it to be uncomfort-

able, as the sharp edge tends to dig into the finger next to the pinkie unless the mouse is held using fingertips. A slight rounding off of this sharp edge would have been welcomed.

The DAATAmouse has a high resolution of 360dpi and operates in a small desktop area, similar to that of the Beetle mouse. It has a switch which allows it to be used for the Amiga or Atari ST and the mouse also incorporates an anti-static extra-lightweight ball similar to the one used in the Beetle mouse.

**Price: £39.99**

**Contact: Pandaal Marketing Ltd.**

**Tel: 0234 855666**



## Contriver 5-in-1 Mouse

The Contriver 5-in-1 mouse seems to be marketed for the all-in-one market where compatibility with other machine formats is a requirement. The package consists of a 2-button 220 dpi mouse, an adaptor lead, a mouse mat, software for the CBM PC3i, and it connects to the Amiga, Atari ST, Commodore PC3i, Amstrad PC, and the Schneider PC. It operates amecably, but its design lets it down as the smooth plastic gives it a down market feel, and my hand didn't seem to obtain a comfortable grip around the casing.

This mouse is supplied with a free T-shirt offer which is sent through the post after the registration card has been completed and sent. Unless you want a free Contriver T-shirt or a multi-machine mouse steer well clear.

**Price: £29.95**

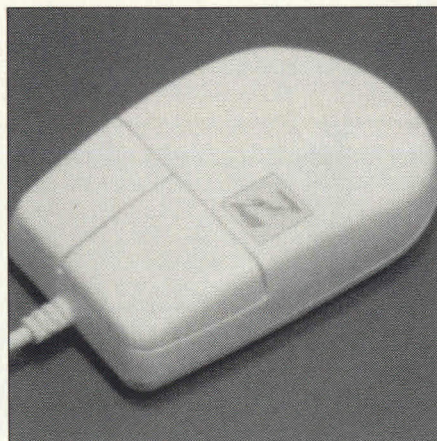
**Contact: Contriver**

**Tel: 0280 822803/4**

## Truemouse/Zydec (Amiga and Atari ST)

The Zydec mouse operates between the Amiga and Atari ST at the flick of a switch, located underneath the mouse, and so does not require unsightly adaptor cables. The casing, like the Contriver 5-in-1, is of smooth plastic design and has two buttons, but is comfortable in the hand. It





feels very smooth in its operation, but it has nowhere near the resolution of most of the others. The Zydec mouse sports teflon feet, which allows it to glide across smooth surfaces, and worked just as well without, as with, a mouse mat, which is fortunate because it isn't supplied with one.

This is a very competent mouse, and for its low price is very well worth investigating.

**Price: £17.95**

**Contact: Evesham Micros**

**Tel: 0386 765180**



### GI-500C

This mouse from Golden Image was reviewed in the February '91 issue of *AUI*. It is similar in resolution to the Naksha (290dpi), but lacks proper feel and performance. The smooth plastic case and bulky size make this a cheap alternative - it is better than Commodore's Amiga mouse, but there have since been better mice at similar or lower prices.

**Price: £26.00**

**Contact: Golden Image**

**Tel: 081-518-7373**

If you want something a little more personalised why not try out a hand-pointed mouselike the one offered as a prize in the March *AUI* Graphics Competition. The mouse is personalised in Germany by Reis-ware Tel: 06542/2086-2087

**P.K.**

### Power Mouse

The Power Mouse from Power computing was a late entrant and arrived after we had gone to press. After testing the mouse we found it to be identical to *That's A Mouse!* in every department including design. Furthermore it was made by Naksha in the Far East!

**Price: £19.95**

**Contact: Power Computing**

**Tel: 0234 273000**

### Summary Table

MOUSE	PRICE	QUOTED	RESOLUTION	PERFORMANCE	DESIGN	OVERALL COMMENT
GI-600 Optical	£56.00	250dpi	good	fair	fair	Very light weight, poor design, and flimsy mouse-mat ruin a great control method
Cordless Mouse	£49.95	220dpi	good	very good	good	Cordless function allows for trouble free movement, but it requires 2xAAA batteries to give a 6 week life
Beetle Mouse	£29.95	320dpi	excellent	very good	very good	Comfortable mouse which has a unique feel and available in many colours
DAATAmouse	£39.99	360dpi	excellent	good	very good	A Jekyll and Hyde, as the mouse is superb for continuous use and has a high resolution, but the sharp-edged design lets it down during normal use.
Naksha	£28.95	280dpi	very good	very good	very good	Good solid mouse which has many extras and has recently been reduced in price
That's A Mouse!	£24.95	280dpi	very good	good	good	Similar mouse to Naksha - a rival but bulkier design and lacks the extras
Truemouse Zydec	£17.95	220dpi	good	excellent	good	Very good value product which has a neat design
GI-500C	£26.00	290dpi	very good	fair	poor	Clumsy design which looks and feels cheapish
Contriver 5-in-1	£29.99	220dpi	fair	poor	bad	Free T-shirt is only perk

**Resolution:** This is measured in dots/pixels per inch of movement.

**Performance:** is proportional to the resolution but also takes into consideration the mouse-button operation and overall feel of the operation.

**Design:** Is based on ergonomics, quality of the materials used, and generally how comfortable the mouse is to operate.

**Overall:** Rounding up of all the mouse's attributes and taking into account pricing.



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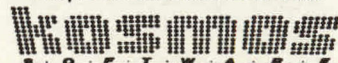
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# Sounds at your Fingertips

**Mike Nelson concentrates on sampling in his continuing guide on programming sound**

In past issues of *AUI* I have described how the Amiga's sound hardware can be put to good use in a number of ways, and this article will show programmers how to play a sample. I have used C because it is easier to describe the various bits of the program, and accessing hardware is not as straightforward as in assembler. Another aspect of this program is reading IFF sound files, generated by the likes of Audiomaster, and a skeletal function for doing this is provided. Note that Sonix does not support this file format, and very naughty it is too. By the way, the line numbers are generated by the "Cross referencer" of Lattice C, and should not be included or the compiler will get very upset and bomb out.

To recap on last month's article, we saw that a sample is a series of bytes (between -127 and +127) which must be fed one by one into the Digital to Analogue converter of the audio hardware. The Amiga-friendly way of accomplishing this is to use the device driver in the operating system, as this ensures fair play if any other task also running wants to make a noise. The use of the audio device is laborious but effective, and I would recommend it to be totally correct, but few of the main-stream programs seem to use it. For practical purposes you can get away with going directly for the registers yourself (it is less involved), but beware of any other programs which may screw up the sound.

An outline of the program goes something like this:

1. Read in the IFF file header, verify it's OK and extract useful bits.
2. Allocate CHIP memory for the sample and load that in too.
3. Set up the hardware registers with pointers, period, volume, etc.
4. Tell the DMA to get going.
5. Wait until the sample is finished.
6. Stop DMA, return resources like memory and bow out gracefully.

There, that is about as close as you get to a Nelson flow chart, so let us now get stuck in with the IFF business. I have not really gone overboard in this department to save space, but the essential components are all there, and IFF has been examined in previous issues of *AUI*. The most confusing aspect I found was the way out terminology of FORMs, BODYs, VHDRs, chunks, headers and all that stuff. The introductory data in an IFF file tells the program what to do with the rest of the information, and the protocol is mind blowingly powerful as you can embed

```

1 /* Playing sampled sounds from the CLI. Shows what the hardware's about
2    but doesn't exactly stick to the rules of gentlemanly multitasking */
3
4 #include "exec/types.h"
5 #include "libraries/dos.h"
6 #include "libraries/dosext.h"
7 #include "exec/memory.h"
8 #include "hardware/custom.h" /* Naughty, naughty, going for the hardware */
9
10 #define MakelD(a,b,c,d)
11 (LONG)(a)<<24|(LONG)(b)<<16|(LONG)(c)<<8|(d)
12
13 #define FORM_MakelD('F','O','R','M') /* Just the bare essentials */
14 #define MYASVX_MakelD('B','S','V','X') /* sorry I can't be more */
15 #define VI-DR_MakelD('V','I','D','R') /* comprehensive */
16 #define BODY_MakelD('B','O','D','Y')
17
18 struct Chunk { /* Watch out for a cunning way of juggling FORMs etc */
19     LONG ChunkID;
20     LONG ChunkLen;
21 };
22
23 struct V_Header { /* Who on earth named these? */
24     ULONG oneShotHiSamples, repeatHiSamples, samplesPerHiCycle;
25     UWORD samplesPerSec;
26     UBYTE cOctave, sCompression;
27     ULONG volume;
28 };
29
30 struct V_Header V_Header; /* Global variables for all the sea */
31 char *file;
32 UBYTE *Sample;
33 ULONG Length;
34
35 void main(); ReadFile(); PlaySound();
36
37 void main(argc, argv) /* Yes folks command line parameters */
38 int argc;
39 char *argv[];
40 {
41     if (argc < 1) /* Should really do a loop here to play */
42         file = argv[1]; /* multiple samples */
43     ReadFile();
44     PlaySound();
45 }
46
47 printf("Hey! I'm not psychic, you know!");
48 printf("Usage: play sample_name\n");
49 } /* End of main(), so drop of into oblivion */
50
51 void ReadFile()
52 struct FileHandle *Handle;
53 struct Chunk Chunk;
54 UBYTE ReadCount;
55
56 Handle = (struct FileHandle *) Open(file, MODE_OLDFILE);
57 if (!Handle)

```



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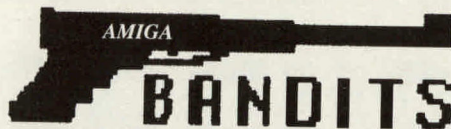
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```

58  printf ("Couldn't open this file, sorry: %s\n", file);
59  Exit();
60 }
61 /* Read in first 8 bytes, called a chunk */
62 if (ReadCount = Read (Handle, &Chunk, sizeof (Chunk)) < 8){
63  printf ("File read error, panic");
64  Close (Handle);
65  Exit ();
66 }
67
68 if (Chunk.ChunkID != FORM){ /* Has to be a FORM to progress */
69  printf ("Sorry, can't understand this file, no FORM, see'n");
70  Close (Handle);
71  Exit();
72 }
73
74 /* We've got some sort of IFF file, time to try for an 8SV */
75
76 if (ReadCount = Read (Handle, &Chunk, 4) > 4){
77  printf ("Panic, fallen off end of file without finding anything\n");
78  Close (Handle);
79  Exit();
80 }
81
82 if (Chunk.ChunkID != MY8SVX){
83  printf ("Panic, again, this ain't a sample.\n");
84  Close (Handle);
85  Exit();
86 }
87
88 if (ReadCount = Read (Handle, &Chunk, 8) < 8){
89  printf ("Panic, fallen off end of file without finding anything\n");
90  Close (Handle);
91  Exit();
92 }
93
94 if (Chunk.ChunkID != VHDR){ /* Should be possible to */
95  printf ("Panic, Oh no, no VHDR\n"); /* rescue the by guessing */
96  Close (Handle);
97  Exit();
98 }
99
100 if (ReadCount = Read (Handle, &V_Header, sizeof (V_Header) : 20){
101  printf ("Panic, VHDR is mangled\n");
102  Close (Handle);
103  Exit();
104 }
105
106 /* Now we need to allocate some memory to load in the sample data */
107
108 Length = V_Header.oneShotHiSamples; /* Easier to spell */
109
110 if (Length > 131072L){ /* Magic number = 128 times 1024 */
111  printf ("This program gives up on samples bigger than 128K\n");
112  Close (Handle);
113  Exit();
114 }
115
116 Sample = (LBYTE *) AllocMem (Length, MEMF_CHIP |
MEMF_CLEAR);
117 if (! Sample){
118  printf ("Sn!! Not enuff chip memory for the sample\n");
119  Close (Handle);
120  Exit();
121 }
122 /* Acl! Got memory, now find BODY to fit it */
123 ReadCount = Read (Handle, &Chunk, sizeof (Chunk));
124
125 while (Chunk.ChunkID != BODY){
126  ReadCount = Seek (Handle, Chunk.ChunkLen, OFFSET_CURRENT);
127  if (ReadCount < 1){
128   printf ("Blast!! It's all gone wrong\n");
129   FreeMem (Sample, Length);
130   Close (Handle);

```

loads of different data types in a single file. People rarely do this as it makes getting the information back out that much more involved.

***"The introductory data in an IFF file tells the program what to do with the rest of the information, and the protocol is mind-blowingly powerful"***

A chunk is simply a sequence of bytes starting with four ASCII characters to label the type of chunk we are dealing with. For our purpose, the file must start with the characters FORM, or we don't want to know. You may be wondering why choose this method of labelling chunks when surely one byte would do. Progress has led us to 32-bit technology where four bytes are equal to one long word. It is therefore easy to read and process a four-byte value, but you do need to know how to manipulate the data in both C and assembler; it just takes a bit of getting used to after an 8-bit 6502! Line 10 is a macro definition, pinched out of the IFF handling listings in the ROM kernel manuals, which converts four characters into a single 32-bit LONG value, and this is applied to the various headers in lines 12-15. Thus, "FORM" in the program is actually a substitute for the number 1179603533, but this is hidden from the programmer and reader, making life look a lot easier.

The first eight bytes of most chunks contain the header and another 32-bit value to say how long (in bytes) that particular chunk is. In order to simplify the read process, I have used a Chunk structure which is declared (line 17) to contain two LONG variables, and the Read() function takes 8 bytes from the file and fills this structure (line 62). We could have read the data into an array of bytes, but the MakeID macro would then have to be applied so the compiler is able handle the two statements. (They don't like comparing different data formats, and so hold you by the proverbial spheres, but it does make your code tighter).

***"We don't have to worry about changing the incoming data from bytes to ULONGs as the ground work has prepared the way"***

Once we've ascertained that we're dealing with an IFF file, we need to see if it's a sound as it is no good to man or beast trying to play a picture. The header "8SVX" stands for 8-bit sampled voice, and this is what we look for next (line 82). Directly after this should be a VHDR header and this is another data structure. C programmers really gain in this situation as all we have to do is design a structure to fit the data (this is how it was created, after all), and the IFF protocols are free with this information, then tell the DOS Read() function



```

150     Close (Handle);
151     Exit ();
152 }
153 ReadCount = Read (Handle, &Chunk, sizeof (Chunk);
154 ) /* and of while which skips over ANNOs, NAMES, CHANs, etc */
155
156 * (if ReadCount = Read (Handle, Sample, Length) < Length);{
157     printf("Binking tell! File mangled'n");
158     Close (Handle); /* Gives up a bit easy, really */
159     FreeMem (Sample, Length);
160 }
161
162 Close (Handle); /* Don't need the file, anymore everything's ready */
163
164 }
165
166 void PlaySound (){
167     extern struct Custom custom; /* Set in compiler/linker */
168     ULONG Period; /* Calculated very soon, see text */
169
170     Period = 3546895L / V_Header.samplesPerSec; /* Magic number,
171     Waaah! */
172
173     custom.aud[0].ac_ptr = (UWORD *) Sample; /* Dis is de data */
174     custom.aud[0].ac_len = (UWORD) Length >> 1; /* Divided by 2 */
175     custom.aud[0].ac_per = (UWORD) Period; /* Frequency, tone */
176     custom.aud[0].ac_vol = 64; /* Loud, Loud, gimme LOUD */
177
178     custom.intreq = 0x80; /* Want to know when sample's over */
179     custom.dmacon = 0x8001; /* Ready, steady, got! */
180
181     while (! (custom.intreqr & 128)); /* Ho Hum. wait for start of sound */
182
183     custom.intreq = 0x80; /* Reset the interrupt register */
184     while (! (custom.intreqr & 128)); /* wait for end */
185
186     custom.dmacon = 0x0001; /* Turn off DMA cos it'll just repeat */
187
188     FreeMem (Sample, Length); /* Give back the sample's memory */
189 } /* Go back to main() and die gracefully */

```

to fill it. We don't have to worry about changing the incoming data from bytes to ULONGs as the ground work has prepared the way. Providing the file was correctly written, we then automatically have a V\_Header structure (line 22) full of all the things we need to know about the sample, like its length, the frequency at which to play it back and the volume. There are other parameters which are important, but for brevity they will have to wait until another day. The things I do for brevity, whoever he/she/it is.

The amount of memory required for the sample is held in the V\_Header, and this program is limited to samples of less than 128K in length. This limit is imposed by the hardware and there are ways around it, but more programming is required. Line 116 asks the operating system to provide us with exactly the right amount of CHIP memory to store the sample, but before we can load it in there are usually a few irrelevant chunks to be dealt with. These are just comments and names of programmers so they can be safely ignored, and we just jump through the file by reading a chunk, checking it is not a "BODY", and using the length portion to skip to the next one. Once a "BODY" has been reached, we load the sample data it contains into the memory we were allocated, its address being "Sample".

Line 142 tells the operating system we have finished with the file and control returns to

main() which simply calls the PlaySound() function.

So much for getting the data, we now have to do something with it and here is where things get technical. The gist of the procedure is simply a matter of telling the audio hardware what to do and letting it get on with it. This involves loading up registers with appropriate values and triggering the DMA apparatus. Direct Memory Access is one of the innovative features of the Amiga in that the 68000 processor is freed from the donkey work of loading the sound data into the D to A by this DMA, which, incidentally, plays a role in most aspects of I/O from things like the display to disk access.

It is necessary to explain how we can read and write to registers from C, a language devoid of those C64 BASIC Peeks and Pokes we all know and love. Lattice recognises the Custom structure as being a representation of the registers in the AGNUS chip, and makes sure that the address of custom is equal to the start of AGNUS in the memory map (currently \$DFFF000). The programmer is subsequently freed from worrying about "Pokes" as registers are represented by unique names, denoted in the usual C structure manner. I wouldn't be too optimistic about this holding true for future revisions of the Amiga, however.

Before we can start on the registers, we have to calculate the Period value. This is the

amount of time elapsing between each byte of sample data going through the D to A, and therefore will determine the frequency or pitch of the sound emitted. The problem with this is we are talking to the hardware which thinks in terms of internal clock signals (related to the time taken to draw a line of the screen), and not the more familiar units of time such as seconds. Translation is necessary, and this is where line 150 comes in. The number 3546895 is derived from various system parameters such as the clock speed (50 Hz for a PAL Amiga) and time taken to scan down one line; full details of how these are added up, multiplied and divided by the number you first thought of are given in the hardware manual. All we need to know is contained in line 150, so we get the Period variable which depends on the sampling frequency of the sound which was itself extracted from the V\_Header of the file.

Lines 152-155 are fairly self-explanatory, simply loading up the required registers, just as we used to on the old 64. One cunning ploy from the designers is that although the sample may contain 1000 bytes of information, the Length is given as the number of WORDs (2 bytes to a word, remember), and so we rotate the bits of Length one place to the right. Try and suss out the advantage of this, answers on a postcard...

There's no noise issuing forth as yet because we haven't told the DMA to get going;

***"The gist of the procedure is simply a matter of telling the audio hardware what to do and letting it get on with it"***

everything is ready so why the delay? We need to get the hardware to inform us when the sample is finished because otherwise it will simply play it over and over again. Whilst this can be handy, we want to avoid it here so we use the interrupt request register to signal that it's all over (line 157). These aren't interrupts in the true sense as all we do is a "busy wait", scanning the interrupt register for a signal, as opposed to going off and writing a separate interrupt handler for the 68000. although this is possible. In fact, this is not strictly correct as the first interrupt heralds the \start\ of sound and we look for the second signal to turn things off (lines 162-3). A bit of clever coding at this point will allow you to play samples larger than 128K, but that is beyond the scope of this article.

The "DMACON" register is the on/off switch, and bit zero is the control for audio channel zero. Bit 15 of this register dictates whether the target bit is set or cleared, and so writing \$8001 turns on the DMA and \$0001 switches the sound off again, leaving the other components (like disks, the copper etc) blissfully ignorant.

Once we've finished with the sound, all that remains is to give the memory for the sample back to Exec (line 167) and fall off the end of the program for another month.

M.N.





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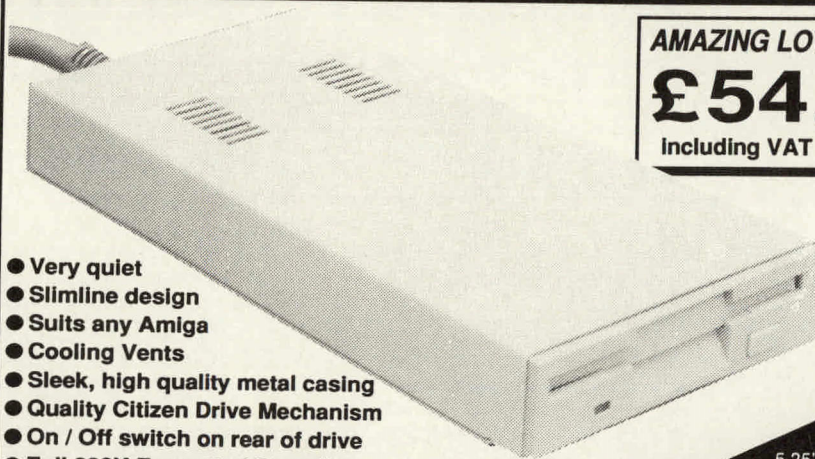
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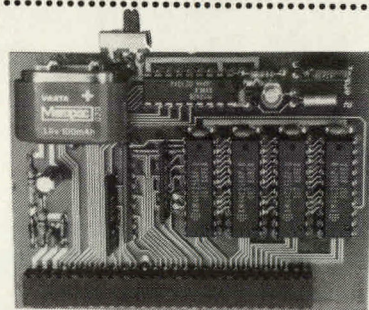
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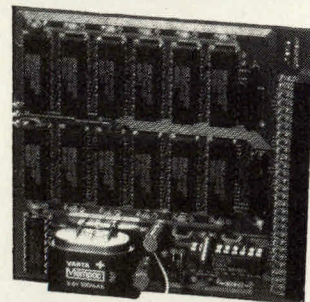
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N.B. : The expansion board requires Kickstart 1.3 to operate - Kickstart 1.3  
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------------------------------	--	---

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# CAMERON HANDY SCANNER 10

***Norman Stone finds that paying more for a scanner may be worthwhile for better results...***

**T**he Cameron Handy Scanner is a small hand-held unit. A document can be scanned (i.e. a facsimile of the document rendered in the computer's memory) by dragging the scanner across it. The width of the scanner is only 105 mm, and any documents wider than this must be scanned in several passes. The scanner can produce results at a resolution of 200, 300 or 400 dpi in monochrome or grey scale (4,8 or 16 shades of grey).

The package contains two disks, one for graphics and the other for OCR (optical Character Recognition). There are two separate manuals supplied, one for each program and, of course, the Amiga adapter. There is also a binder for a printout of the supplemental readme files supplied on the accompanying disk, or for your own notes.

The Adapter for the scanner is plugged in to the side expansion port on the Amiga, it measures two inches by five and half inches, so take up very little space and is out of the way and protected from harm, not always the case with other scanners.

On loading the graphics program, there are a series of icons in two rows down the left hand side of the screen. There are also further icons that will appear when you click on some of the first icons, providing a 'second layer' to the product. Just about all functions you could want in such a package are represented here. The graphics program carries virtually every drawing tool you require. In fact, you will find that there are more tools here than in many drawing products. The list of tools is:- points, freehand drawing, pattern brush, eraser, lines, rays, circles, filled circles, ellipses, filled ellipses boxes, filled boxes polygon, filled polygons, text, placed text, spraycan, curves, box cutout, free-hand cutout, lens, symmetry, brush control.

Also included in the drawing program are 30 fonts to whet your appetite for different text you might want to include in your scanned image. (Some of the fonts I have never heard of). The fonts are:- Balloon, Chip, Compacta, Daterin, Flatbold, Fralstar, German, Lectura, Median, Normal, Oldletters, Palace, Roman, Script, Space, Stop, Unzial, Ball, Boldface,

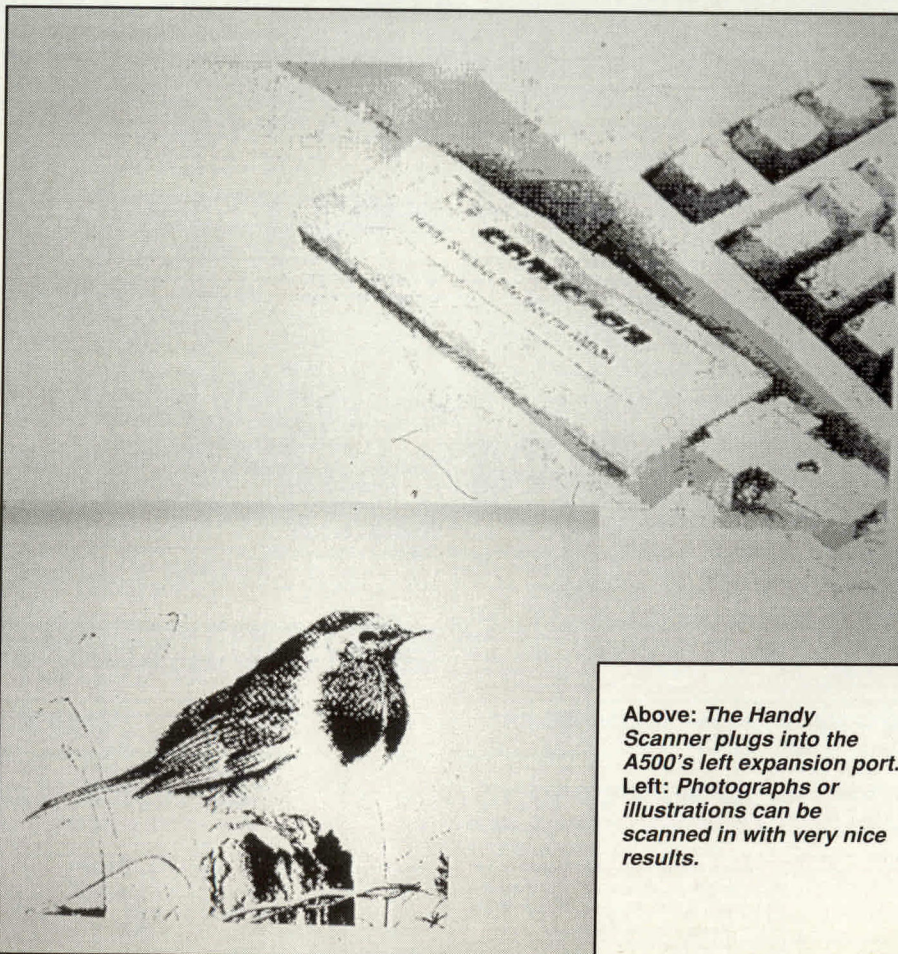
Computer-style, Fat, Flatface, Future, Greek, Light, Micro, Olde-English, Ornament, Plotter, Russian, Small-fancy, Special, Suetterlin. This is a very satisfactory drawing package.

Among the various actions you can take with a scanned item is 'zoom by scale'. This means you can decrease the size of a picture with very little loss of detail. You can zoom by scale at 1,2,3,4 and so on, zoom by 1 is making half scale zoom by 2 means quarter scale etc.. You mark the start point with the mouse, keeping the button depressed until the required frame is reached. The X,Y coordinates will be altered in proportion. You can then go to a second buffer and copy it to that screen,

but you must remember to pull the scroll bar down to the bottom otherwise the picture will not fit. (That is not mentioned in the manual).

An interesting sidelight on the way this scanner works in monochrome mode is that, if you were to photocopy(say) a letter written on a blue background, it would almost certainly come out black on black. The scanner however will only register the black writing, and this will be reproduced on a pure white background.

The image manipulation software contains seven buffers or 'windows' these can be any size up to the limit of available memory. Each time you scan a document, it is saved into one of these buffers. If your



**Above: The Handy Scanner plugs into the A500's left expansion port. Left: Photographs or illustrations can be scanned in with very nice results.**



document is wider than the maximum width, it can be scanned in a number of passes, placing each pass into a separate buffer. The buffers can then be edited, moved around and joined together until a composite is produced that matches the original. Although rather tricky to use (it could have been better documented with a few illustrated pictures) exceptionally good results can be achieved with this technique.

***"The OCR software can be used to analyse a scanned document and 'read' any text within it."***

The software itself appears to have been written for a colour scanner, as there are several items on the menu ('define colour', 'colour math' etc.) which are not pertinent to this particular unit. It would have saved some memory if these particular options had been omitted.

One important factor that is usually taken for granted is the 'save' option. There are two save options: one is in the pull down PICTURE menu, and the other is in the EXTRAS pull down menu. The save option in the PICTURE menu, if used, can only load a saved scan back into the program for future use or into a HAM package such as PHOTON PAINT. You would not be able to view a satisfactory picture if you tried to use a program such as DPAINTIII to manipulate a saved scan. But if you employed the save option in the EXTRAS menu you could view and use the saved scan in DPAINTIII with satisfactory results. But there is a small catch, in the short section in the manual explaining the save function. It states 'This function saves the current picture buffers. Enter a file name as Amiga customarily demands; the format is compressed, if you have chosen

***"If your document is wider than the maximum width, it can be scanned in a number of passes, placing each pass into a separate buffer."***

this in "EXTRAS" as the IFF format is used, pictures can thereafter be used in nearly every graphics program'. What it does not explain is that the picture saved in EXTRAS can only be used as a HI-RES

picture. You can not use it as LOW-RES or MED-RES and that it really is a screen dump, so you do actually end up with the whole screen, ICONS as well!!.

You would now have to delete the icons saved with you scan. So, if you dislike the flicker in HI-RES and the icons that accompany the saved scan, you would have to use the save option in the PICTURE menu and import the scan into a HAM package or any DTP package, where you would view just the picture you had scanned.

The OCR software can be used to analyse a scanned document and 'read' any text within it. Essentially it does this by analysing the shape of each character to determine which (if any) letter it is. OCR software in general is not very clever at doing this, and requires the shapes of letters to be specifically defined for it.

Because the shapes of letters are different for different fonts and typefaces, the



Above: Jonathan Ellis of Psygnosis featured in AUI's Newsfile. This is a scan of a section of the page. Right: Graphics which have been scanned can be touched-up and altered using the accompanying software.

OCR software requires a separate font definition for each font you wish it to recognise. The software supplied with this scanner

contains only four font definitions. If the text being scanned is not similar to any of these, it is possible to 'teach' the OCR software the shapes of the new letters.

Once taught, the software can then attempt to recognise the scanned text. Any item that it fails to understand will be queried, allowing you to manually correct the text. Even though the software has been taught all the letters, it can still make mistakes, since there may be variations in brightness or contrast or even the quality of printing within the document; which may be non-detectable to the human eye, but plain as day to the scanner.

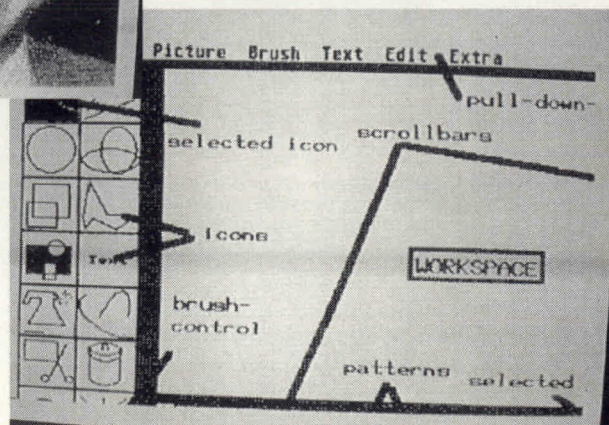
In using any hand scanner, it is important to keep it in a straight line and at a constant speed. For this purpose, I made

a guide from a two lengths of wood, raised up slightly on small blocks. The distance between the two strips of wood being the same as the scanner, the guide was then placed on to some veneered oblong-shaped chipboard. The purpose of the blocks is to allow the document to be positioned correctly under the wooden strips. The scanner can be moved down

***"The graphics program carries virtually every drawing tool you require. In fact, you will find that there are more tools here than in many drawing products."***

between the two wooden strips and pulled down over the document that is on the oblong piece of veneered chipboard. The two sections of wood can be used as a ruler guide for the document. The chipboard has to be veneered or covered some way, so that the shreds of chipboard do not foul the scanner rollers.

Overall I was very pleased with the results I obtained with the scanner, although various important pieces of information are missing from the manuals. It can be used to achieve very good results,



for scanning pictures to be used with genlocks in video work, or if you are looking through a magazine or a book and find an article or picture you would like to use in your own magazine for Scout Groups, clubs etc. (Though, of course, you must ask permission of the publication from it which comes before you can use it publicly). The Cameron Scanner is more expensive than some others but it provides more options than many and gives excellent results.

N.S.

Price: £235.00

Contact: ComputerHouse UK, 14 Romily Court, Landridge Road, Fulham, London SW6 4LL



Continued from page 49.

familiar Mandelbrot graph represent these different rates of expansion. The choice and number of colours is purely arbitrary - you just pick the values that look nice. In the world of fractals, aesthetics is just as important as mathematics.

The next step is make the initial value of Z to be zero (both real and imaginary parts). Then for each point on the graph, assign a value to the real and imaginary parts of C, and start it repeating.

Letting the equation repeat (or 'reiterate') itself forever would get a bit boring, so it is usual to let it repeat for a set number of times. For the Mandelbrot equation, 512 times is usually good enough, although you may use less (with a resulting drop in accuracy) if you are in a hurry. Remember, an entire screen of 320 by 256 pixels will need a lot of sums.

**" 'It will never amount to anything much' they said, and went back to their slide rules."**

By choosing a colour to describe the rate at which the equation blows up, we obtain the familiar Mandelbrot shape. The start and end values of C needed to map the entire set are -2, -2i to +2, +2i and the result (depending on choice of colours and resolution) will be like figure 2, produced using a program like Listing one.

If we now zoom in on part of the set by careful choice of the range of values that C can take, the detail in the graph is enlarged. Or rather it doesn't enlarge - it diversifies, for as we get closer and closer, the detail becomes greater and greater.

The only limit to how much we can zoom in is the precision of our arithmetic.

For example, say we are looking at the part off the set with start co-ordinates of 0.2323 and 0.2324i (real part then imaginary part) and end co-ordinates 0.2324 and 0.2345i. To look at a section inside this box, we could use co-ordinates 0.23235, 0.23245i and 0.23236, 0.23246i. Theoretically we could go on, deeper and deeper into the set. Practically, our computer would run out of decimal points and the results would start to mean less and less as rounding errors became apparent. Figure 3 is the result of moderate zooming in on a section on the set. The choice of colours has been changed from the first M-set image.

J.K.

**Next month AUI looks at other sets, further reading matter, suggested programs and a few example DIY programs**

## Complex Arithmetic Made Easy

Complex arithmetic introduces the concept of expanding our everyday numbering system. The set of Real Numbers contains elements such as 1, 0, -42, 0.5 and is the set we are most used to dealing with. However, there is a equally large set of numbers called the Imaginary numbers.

The term 'imaginary' is an unfortunate choice because it tends to give the numbers some kind of mystical power. You could be forgiven for thinking of Imaginary numbers as nothing more than figments of over-worked minds, invisible to mere (sober) mortals, and impossible to write down on paper.

Thankfully this is not the case. Imaginary numbers are a powerful tool to help solve many varied problems. To see where they come from, consider the following equation:

$$x^2 - 4 = 0$$

This can be rewritten as

$$x^2 = 4$$

and it follows that X is either 2 or -2 (remember that -2 times -2 is equal to 4 too).

But what if the equation had been:

$$\begin{aligned} x^2 + 4 &= 0 \\ \Rightarrow x^2 &= -4 \\ \Rightarrow x &= \pm \sqrt{-4} \end{aligned}$$

You might think there is no solution, for as anyone with a pocket calculator will tell you, there is no such thing as the square root of a negative number.

Here's the important bit: A solution does exist if we define it in terms of a constant, normally called 'i' (or sometimes 'j'), such that i is the square root of -1. Or put another way, i is a number such that i times i is equal to -1.

Now we can solve our 'unsolvable' equation:

$$\begin{aligned} x^2 &= -4 \\ \Rightarrow x &= \pm \sqrt{-4} \\ \Rightarrow x &= \pm \sqrt{4} \cdot \sqrt{-1} \\ \Rightarrow x &= 2 \cdot i \\ \Rightarrow x &= 2i \end{aligned}$$

We can check it by squaring 2i:

$$\begin{aligned} 2i \cdot 2i &= 4 \cdot i \cdot i \\ \text{but } i \cdot i &= -1 \\ \text{so } 2i \cdot 2i &= 4 \cdot -1 \\ &= -4 \quad \text{Q.E.D.} \end{aligned}$$

Any number can now be thought of as having both 'real' and 'imaginary' parts. These 'complex numbers' are all defined using the letter i to denote their imaginary part. For example, the complex number 2-3i has a real value of 2 and an imaginary part of -3i.

The addition and subtraction of complex numbers is easy if you take each part of the number and deal with them separately. For example,

$$\begin{aligned} 2+2i + 3+2i &= 5+4i \\ 2-3i - 2-4i &= 0+1i = i \end{aligned}$$

Or generally,

$$a+bi + c+di = (a+c) + (b+d)i$$

Multiplication isn't so tough either. Each part of each number must be multiplied together, remembering that if we multiply two i's, we get minus one.

$$\begin{aligned} a+bi \cdot c+di &= ac + adi + bci + bdi^2 \\ &= ac + adi + bci - bd \\ &= (ac - bd) + (ad+bc)i \end{aligned}$$

An important result (to us, anyhow) is what happens when a complex number is squared. What do we get when we multiply a complex number by itself?

$$\begin{aligned} a+ib \cdot a+ib &= a^2 + a^2i + ib^2 + ib^2i \\ &= a^2 + 2abi - b^2 \end{aligned}$$

Thus the square has both a real component (no i's),  $a^2 - b^2$ , and an imaginary component,  $2abi$ .

Division is a bit tricky, because dividing by an imaginary number is pushing the credibility stakes a bit too far. We cheat a little by getting rid of the imaginary number on the bottom, by multiplying both top and bottom by the 'conjugate' of the complex number. This trick eliminates the imaginary part of the denominator without changing the value of the original number. Although the solution looks cumbersome, in practice it can be re-written as a single complex number.

Note: The conjugate of  $a+ib$  is  $a-ib$ .

$$\begin{aligned} \frac{a+ib}{c+id} &= \frac{a+ib}{c+id} \cdot \frac{c-id}{c-id} \\ &= \frac{ac - adi + bci + bd}{c^2 - cdi + cdi + d^2} \\ &= \frac{(ac+bd) + (bc-ad)i}{c^2+d^2} \\ &= \frac{(ac+bd)}{c^2+d^2} + \frac{(bc-ad)i}{c^2+d^2} \end{aligned}$$

Using complex numbers greatly simplifies a large number of equations, especially those which involve waves of any kind. All sorts of engineering problems become easier by using complex numbers.

If you are upset that we should be able to use 'imaginary' numbers to solve real world problems, just think for a moment: We dreamt up the real numbers too.

Mathematics is just a set of rules. If we play by them, we can solve puzzles which we set ourselves. Sometimes the puzzles relate to real world problems, and if we solve the puzzles we can also solve the external problems.

J.K.



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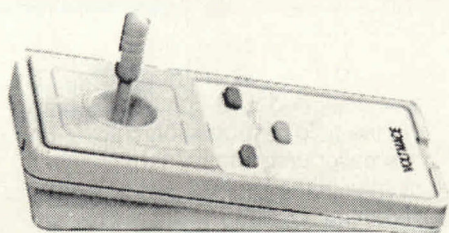
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All prices are correct as of 14th March 1991. E&OE. All trademarks respected.



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# Hyperbook

**Multimedia is no longer a distant professional tool which home users cannot access. Pat Kelly takes a look at one of the programs which are now bringing it to everybody with an Amiga...**

**H**yperbook is one of the emerging Multimedia authoring systems which are set to change the way we work, learn, and play, on our Amigas. So we are led to believe anyway. Just as Cando allows non-programmers to create professional, user programs, Hyperbook allows anyone with a 1 Megabyte Amiga, and a secondary drive (floppy or hard), to create professional computer presentation systems, or "books".

## What Is Hyperbook?

Before explaining how Hyperbook works, or how easy it is to work, it is useful to know what it actually produces, since that was my first question after receiving the package for evaluation.

Hyperbook is a similar concept to the overhead projector or school text book, albeit on computer. The theory of the electronic book is that it works using pages. Each page holds relevant and useful information and can contain informative text, small notes, pictures, graphs, and lists. Once a page has been read then a new page is displayed with more information, and so on. One problem is that you may want information on a random page. A simple "goto" would suffice, but if you did

not know exactly what you information wanted, or if you did, where it was, you would have to browse through page upon page until the relevant information was displayed.

Hyperbook does to this book-form as hypertext does to normal text files. By clicking on objects which are set-up on the page it is possible to access chapters of the book. In this way a 100-page book can be split into chapters, sub-chapters, and reference pages.

Hyperbook is also similar in operation to the Workbench - you click on an object and a program is set running, a window is opened, or a file is accessed.

## System Guide

Hyperbook is supplied on two disks, a manual, and an applications handbook. The disks can be backed-up, installed on hard disk, and run from Workbench or CLI. The disks contain two main applications, the Hyperbook editor and the Hyperbook reader, and several sample books. As their names suggest, the editor is used to create, read, and edit existing hyperbooks while the reader contains no editing facilities and only allows hyperbooks to be read. The reader is the

more compact application and can be included on stand-alone disks which contain hyperbooks. These stand-alone books can be distributed, sold, and even placed in PD libraries.

## Pages

The page is the basic unit of the hyperbook. A hyperbook can contain any number of pages, limited only by the amount of memory available. The first page of the hyperbook is the introductory page - a master-menu page which contains information. Secondary pages can contain full-screen IFF pictures, a page full of text, or a sub-menu, through which other pages can be accessed.

Pages can be created with 4, 8, or 16 colours from a palette of 4096, lowres or hires screens, can have IFF picture backdrops, and have several different transition styles.

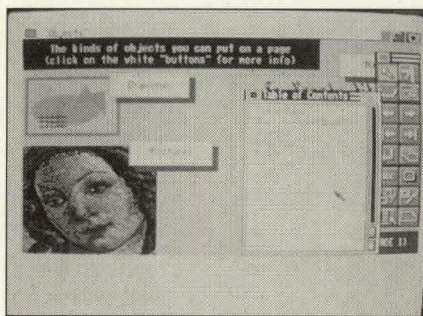
## Objects

Objects are placed on each page and act similar to icons in a Workbench environment. Clicking on an object executes an action which is predefined when creating the object.

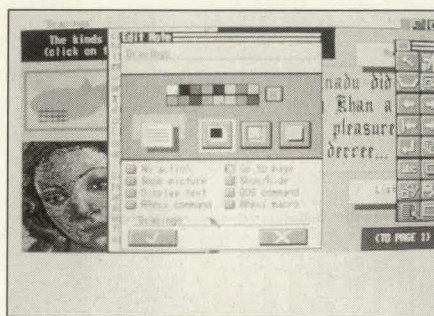
To simplify the execution of commands



Hyperbooks like this can be produced with considerably little effort. The background is an IFF displayed as a picture object and the text is inside a text object. When the picture object is clicked its "action" changes the text object to one with different text, and the picture of the head changes too - it is a smaller picture object!

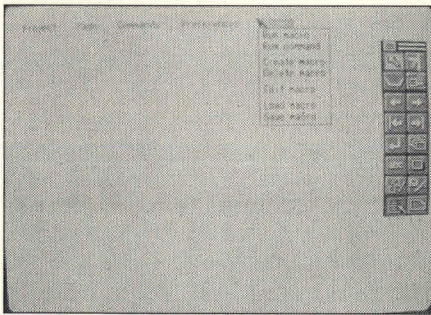


A list of contents can be called up when editing the book. This list shows all pages and the reference names given to them. The object displaying the contents is an actual Hyperbook "List" and the page can be entered by simply clicking on its title.



This is the Edit object menu - a Note in this example. Notice the list of actions which can be assigned to the Note merely by clicking on the appropriate icon. In this case the action is to Go To Page "Drawings".





*This is the blank Hyperbook page. The top pull-down menus contain the less-used functions while the main control panel (right) contains all of the more common command tools.*

there are five types of objects. Each is created in a different way in order to keep its own specific identity. The objects - Notes, Buttons, Pictures, Drawings, Lists - are created in different ways, but when created can accommodate similar requests.

Notes and Buttons are used to display text and provide "action" hot spots respectively. When a Note object is created a window is sized and relevant text can be input. The text can be allocated differing fonts, colour, and spacing. A Button is merely a Note without text.

Picture objects are created from IFFs and when initially defined a suitable filename is prompted. The IFF picture is loaded and the object produced by scaling down the whole picture, or by taking a section from it.

Drawing objects are created using Hyperbook's internal drawing tool, which is a mini-art program and supports many tools including circles and fills.

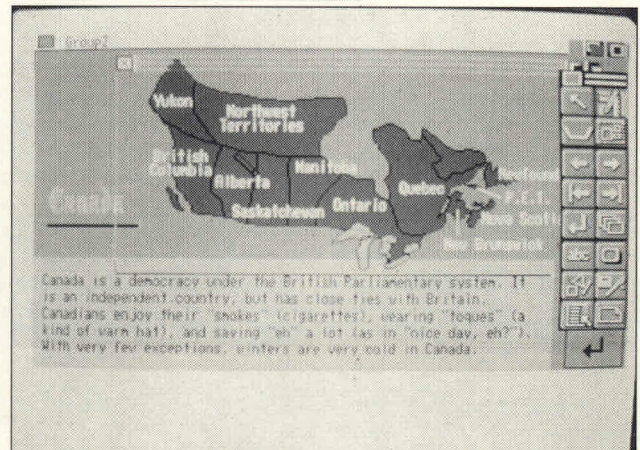
Lists are objects that contain a list of separate lines of text, each of which may have its own action. Lists are different from the other objects in that only one action can be executed from the others. Lists are used for applications such as directories, or databases. By clicking on a letter, or surname, a screen can be displayed showing the full information on that line of text.

## Actions

Actions are the power behind the Hyperbook. With them it is possible to show pictures, execute DOS commands, display text, execute AReXX commands or macros, go to page xx, show/hide an object, or no action. "No action" objects are included for information and headers, and are just as useful as "action" objects. Thus, by clicking on certain objects on a page commands, or a command list, can be executed. Clicking on appropriate objects can also return control to any page via the Go To Page action. This page-nesting effect cannot be charted as trees - like normal directories can - as any object on a page may call any other page in the hyperbook - even if other objects can call the same page.



*The atlas is a great example of how the Hyperbook can be used. Clicking on one of the continents will display a page which contains more local information.*



## Editing Hyperbooks

The Hyperbook editor contains a main control panel which holds all of the tools required to create or edit hyperbooks. These tools are used to create the different components of a book - create page, create group, create picture, etc.. Creating a book is achieved by starting on page 1 and assigning objects to that page. When creating an object an exclusive "action" is assigned to it via the edit object panel. This action could be displaying a picture or a goto page xx. If "no action" is chosen then the object will have no function other than as an information icon.

Most of the editing is done through objects. When editing objects (after clicking on the edit icon on the main control panel) an Intuition window is opened around it (each object is enclosed in a window). These windows have sizing, depth arranging, and close gadgets. The "edit object" menu is accessed by clicking on the right mouse button over these.

## Creativity

It is easy to see that anyone with a creative flair can produce professional hyperbooks which would look far superior to the basic example screens shown on these pages. IFF pictures can be used as backdrops and drawings placed on top and used as objects. Previous to Hyperbook this was not readily available to normal users and a proficiency in C, or assembly language, was required. For

many years now it has been prophesied that programs would eventually be written by non-programmers. With Hyperbook the reality is here.

## Conclusion

After using Hyperbook I was amazed at what is possible with so little effort. The only criticism I can make is that the editing facilities were slower than those on packages like DeluxePaint. But, a useful feature was that the whole Hyperbook can be condensed into a small window bar on the Workbench screen, thus relieving memory for other Amiga applications. The expand/reduce box in the window can be pressed to return the Hyperbook in the same status as when it was left. As Hyperbook is aimed at the Workbench user this function is highly desirable and should be included in more applications.

The Hyperbook manuals are intuitive and explain each function in detail and praise must be given to the authors.

Hyperbook is a professional and worthwhile utility which is pointing the way in applications programming.

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# AUI-SPELL

## part 4

*This month Paul Overaa looks at the binary tree routines which allow a sorted, duplicate-free list of words to be extracted from a text file...*

Last month saw the completion of the code designed to read a file into memory, scan it, and build a set of binary tree descriptors for every unique word in the file. This month I want to look at the benefits which such tree arrangements can offer and develop useful tree searching routines. There are two approaches that may be used... recursive and non-recursive...

### RECURSIVE SOLUTION

The recursive solution is, in terms of conciseness, stunningly effective. This following routine will print an alphabetically ordered list of every word present on any tree structure...

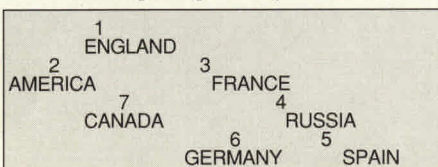
```
void inorder_treeprint(struct TreeNode *node_p)
{
    if (node_p != NULL)
    {
        inorder_treeprint(node_p->left_descendant);
        printf("%s\n", node_p->word);
        inorder_treeprint(node_p->right_descendant);
    }
}
```

I am not going to say too much about the recursive form but some points need to be made. Recursion is elegant but in practice, because of the effective deep-nesting of calls under certain conditions, it can (because of the time taken for parameter passing) result in routines which are slower than non-recursive equivalents. Error handling, when deep nesting results in running out of pre-determined system stack space, can also be a problem. Recursive solutions, because of their conciseness, are also likely to be quite difficult for newcomers to understand.

### NON-RECURSIVE SOLUTION

Developing a non-recursive tree search algorithm is considerably more difficult than might be imagined and it is worth looking at a few of the tasks involved to see how this problem is tackled. One job which must be done is to develop a routine which can find the alphabetically lowest node on a given tree since this will be needed as a starting point.

Have a look at figure 1 which repeats the word tree diagram given in part 3...



Picture yourself sitting at the root node (node 1) which holds the word ENGLAND and ask... how can I find a node which is alphabetically less than this current node? It should be obvious from last month's discussion that it is necessary to move to the left descendant and, for the example in question, this means moving to node 2 which holds the word AMERICA.

Now ask the same question again. How do we find a node which is alphabetically less than this current node? Again the idea is to look for a left descendant. In this particular case there isn't one... so that tells us that AMERICA is the lowest word (alphabetically) on the tree. This approach tells us exactly how to find the starting point for producing an alphabetical list of words from the tree structure... we keep moving to left descendants until such time that a node is found which does not have a left descendant.

The definition of the TreeNode structure tag that mirrors the layout of the descriptors being built by the assembly language patch looks like this...

```
struct TreeNode {
    ULONG count; /* number of characters in word */
    TEXT *word; /* pointer to word */
    struct TreeNode *left_descendant;
    struct TreeNode *right_descendant;
};
```

and bearing that structure definition in mind a routine to identify the alphabetically lowest node on a given tree can now be written fairly easily. Here is a typical example...

```
struct TreeNode *FindLowest(struct TreeNode *node_p)
{
    while (node_p->left_descendant)
    {
        node_p = node_p->left_descendant;
    }
    return(node_p);
}
```

Finding the node which is next in ascending alphabetical order is rather more awkward. The technical descriptions of how such algorithms are developed can be obtained from most data structure textbooks but figures 2 and 3 give flowchart and Warnier diagram outlines of the actions which have to be carried out.

There is a problem to solve: During the tree searching process we need to climb, as well

as move down, the tree. The recursive solution does this automatically as it moves between the various calling levels. A non-recursive search can move down a tree (using the left and right descendant fields)... but it cannot move up to a parent unless some means is found of storing parent information. Worse than that you will see from figures 2 and 3 that it is also necessary, as we move up the tree, to know whether we are moving up from a left or a right descendant. Why? It is because if we are moving up from a right descendant (ie have just printed or dealt with a right descendant) then the parent encountered would be alphabetically less than the current node. Such a node would consequently need to be ignored since it would already have been dealt with during an earlier 'node visit'. If on the other hand we are moving to a parent from a left descendant then this parent will be alphabetically greater than the current node. Nodes of this latter type obviously need to be printed or dealt with as they are encountered.

One way of tackling this difficulty is to add an extra field to each node descriptor which stores the address of its parent node. The disadvantage here is the extra space required. What is really needed is some way of memorizing the path being taken as the tree structure is traversed so that we can follow the path backwards when having to 'climb back up the tree'. The idea is simple enough - whenever a move to a descendant is made the address of the current node (ie the parent) is stored and a note made of whether the move is being made from a left or a right descendant.

This is most easily done using a data structure called a Last-In-First-Out (LIFO) list - known more commonly as a stack data structure. The type of operations which can be usefully associated with stack structures are well known. Amongst other things there has to be some means of defining and initializing a stack data structure, routines for pushing items onto the stack, and routines for retrieving the items in LIFO order.

I have chosen to implement stack facilities using an abstract data structure approach. The ADT philosophy is essentially simple... by defining the important



characteristics, ie the properties, of an abstract data structure, and identifying the allowable operations, we arrive at a definition which, together with its associated (and well-defined) operations set (interface definition), becomes a 'data structure' building block which can be used to solve problems.

As far as my stack ADT user-interface is concerned, five access routines are available...

```
s=CreateStack(t) This initializes a stack suitable for storing items of type t specified by the applications program and returns a pointer s to the stack's descriptor.
e=PushStack(s,x) This stores item x on stack s and returns an error flag e that is TRUE if an error has occurred.
e=PopStack(s,x) This retrieves an item from stack s and places it in variable x. Errors are signified by the returned error flag e being TRUE.
KillStack(s) This unloads and then removes the stack s from the list of currently defined stacks.
No return value.
f=StackEmpty(s) This tests stack s to see if it is empty and returns a flag f as TRUE if there are no items on the stack.
```

These routines, which are available in a precompiled module, enable stacks to be created which are going to store parent nodes and left/right path indicators. Here are the statements that create the stacks...

```
g_parent_stack_p=CreateStack(struct
TreeNode*);
g_path_stack_p=CreateStack(UBYTE);
```

and here is the modified routine for finding the alphabetically lowest node on a tree which shows some typical stack operations...

```
struct TreeNode *FindLowest(struct TreeNode
*node_p)
{
while (node_p->left_descendant)
{
PushStack(g_parent_stack_p, node_p);
PushStack(g_path_stack_p, LEFT);
node_p=node_p->left_descendant;
}
return(node_p);
}
```

You will find other examples of these routines in the following source code which is the completed utility that can extract words from a textfile and provide a sorted duplicate-free list of every word present...

```
/*
*/
/* EXTRACT WORDS: Non-recursive word
separator */
/*
*/
/* Programmer: Paul Overaa
*/
/*
*/
/* Date: 8th Jan 91
*/
*/
*/
```

```
/* Note: The program provides a sorted,
duplicate-free, list of words. */
/* Use from the CLI/Shell like this...
extract_words <filename> */
/*
*/
/* some defines... */
#define FIB_SIZE (LONG) (sizeof(struct
FileInfoBlock))
#define MESSAGE1 "sorry - cannot get details
of this file\n"
/* some includes... */
#include <exec/types.h>
#include <exec/memory.h>
#include <libraries/dos.h>
#include <ram:stack_adt.h>
/* some structures... */
struct TreeNode {
ULONG count; /* number of characters in
word */
TEXT *word; /* pointer to word */
struct TreeNode *left_descendant;
struct TreeNode *right_descendant;
};
/* some prototypes... */
void InorderTreePrint(struct TreeNode
*g_node_memory_p);
struct TreeNode *FindNext(struct TreeNode
*node_p);
struct TreeNode *RightExists(struct TreeNode
*node_p);
struct TreeNode *TestForRoot(struct TreeNode
*node_p);
struct TreeNode *FindLowest(struct TreeNode
*node_p);
/* some globals... */
ULONG g_filesize, g_word_count;
UBYTE g_path, LEFT=1, RIGHT=2;
TEXT *g_buffer_p;
struct TreeNode *g_node_memory_p;
void *g_parent_stack_p, *g_path_stack_p;
/*
*/
main(int argc, char *argv[])
{
BOOL error_flag=TRUE; /* guilty until proven
innocent approach */
struct FileHandle *fh;
struct FileLock *filelock_p;
struct FileInfoBlock *fib_p;
if(argc=2)
{ /* user has given a filename so first check to
see if it exists */
if (filelock_p=(struct FileLock
*)Lock(argv[1],ACCESS_READ))
{
if(fib_p=(struct FileInfoBlock
*)AllocMem(FIB_SIZE,MEMF_PUBLIC))
{
if(Examine(filelock_p,fib_p))
{
g_filesize=fib_p->fib_Size; /* now we know
how big the file is */
if(g_buffer_p=(TEXT
*)AllocMem(g_filesize,MEMF_PUBLIC))
{
if((fh=(struct FileHandle *)Open(argv[1],
MODE_OLDFILE))!=NULL)
{
error_flag=FALSE; /* clear... every-
thing worked O.K. */
g_filesize=Read(fh,g_buffer_p,g_filesize);
Close(fh);
WordCount(); /* preliminary scan to
count max words */
if (g_node_memory_p=(struct
TreeNode *)
AllocMem((g_word_count+1)*16,MEMF_CLEAR))
{
SeparateWords(); /* build tree
descriptor */
InorderTreePrint(g_node_memory_p);
FreeMem(g_node_memory_p,
(g_word_count+1)*16);
}
}
FreeMem(g_buffer_p,g_filesize);
} /* end of if AllocMem() for buffer */
} /* end of if Examine() */
FreeMem(fib_p,FIB_SIZE);
} /* end of if (fib_p) */
Unlock(filelock_p);
} /* end of if (filelock) */
} /* end of if (argc=2) */
if (error_flag) {printf(MESSAGE1);}
```

```
/* end of main() */
/*
*/
/* BINARY-TREE-ROUTIN
E S */
/*
*/
void InorderTreePrint(struct TreeNode *node_p)
{
g_parent_stack_p=CreateStack(struct
TreeNode*);
g_path_stack_p=CreateStack(UBYTE);
node_p=FindLowest(node_p);
while(node_p)
{
printf("%s\n", node_p->count, node_p-
>word);
node_p=FindNext(node_p); /* FindNext()
returns NULL if no more nodes */
}
KillStack(g_parent_stack_p);
KillStack(g_path_stack_p);
}
/*
*/
struct TreeNode *FindNext(struct TreeNode
*node_p)
{
if(node_p->right_descendant)
return(RightExists(node_p));
else return(TestForRoot(node_p));
}
/*
*/
struct TreeNode *RightExists(struct TreeNode
*node_p)
{
PushStack(g_parent_stack_p, node_p);
PushStack(g_path_stack_p, RIGHT);
return(FindLowest(node_p->right_descendant));
}
/*
*/
struct TreeNode *TestForRoot(struct TreeNode
*node_p)
{
BOOL exit_flag=FALSE;
do
{
if (StackEmpty(g_parent_stack_p))
{node_p=NULL; exit_flag=TRUE;}
else
{
PopStack(g_parent_stack_p, node_p);
PopStack(g_path_stack_p, g_path);
if (g_path==LEFT) exit_flag=TRUE;
}
} while (!exit_flag);
return(node_p);
}
/*
*/
/* If node supplied does NOT have a left
descendant then
following routine returns the unchanged node
address */
struct TreeNode *FindLowest(struct TreeNode
*node_p)
{
while (node_p->left_descendant)
{
PushStack(g_parent_stack_p, node_p);
PushStack(g_path_stack_p, LEFT);
node_p=node_p->left_descendant;
}
return(node_p);
}
/*
*/
*/
```

## Next Month

Learning how to implement an Abstract Data Type (ADT), such as a stack, in a way which is totally transparent to an applications program is one of the most useful things a programmer can learn about. Next month, before moving on to the next stage of AUI-SPeLL proper, we will show you how those ADT stack routines were written !

to be continued...

P.A.O.



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# Amiga Answers

Andy Eskelson searches out the answers to your tough technical questions

**Dear AUI,**

I have a problem: My computer is giving me trouble. Whenever I issue the diskcopy command the drive hangs up. The problem is not software related as the same thing occurred using a fresh copy of workbench. The drive will still read disks, and will still copy one file at a time.

**Alex Baker,  
Coventry**

**Dear Alex,**

*That is a very odd problem indeed. I assume that you are using the diskcopy command correctly, and that you are not trying to copy a protected disk.*

*Try to format a disk that will test the drive itself. I have a very dodgy external drive that will read disks but not write to them very well!, use the command :*

*Format Drive DF0: Name Testdisk and see what happens. If you get problems then try a few different disks, just in case you have a dud batch of disks. If all is well then you could have an attack of the viri, give your system a check up with Virus X and KV and check for IRQ type viruses.*

*You may have a loose chip. The cure is to push them back, an easy job if you are electronically minded, otherwise take it to a proper engineer to have a look at.*

*Try to borrow an external drive, and try to diskcopy with that, if that works it is pointing to a faulty drive. A new drive costs about 70 pounds, but you will have to have it fitted so expect to pay about 100 pounds or so. It might be worth getting a quote or two before you commit yourself to any repair shop.*

**Dear AUI,**

I have aquired from a friend an Okimate 20 printer but to date I have been unable to operate it via my A500. The printer has a RS232 serial type personality module and the interface cable has been checked as being compatible.

I read in a recent Test Drive that AUI carried out on the Okimate 20 that the drive ROM had been replaced by an Amiga

version.

Would changing the drive ROM solve my problem. If so where could I obtain one from?

**N George,  
Herts.**

**Dear N George,**

The driver ROM may cause a few problems for you, but you should still be able to get it to print out something. The serial interface should not cause any problems at all. Make sure that you plug it into the correct socket on the A500, and select the SERIAL option with preferences. remember to save the setting and reboot the machine, or click on the USE gadget. You will also have to set the baud rate, parity and flow control to match the settings on the printer. The only other thing to do is to select the correct printer driver. You will find a long list of drivers on the extras disk. If in doubt use the generic driver, that will get you text only, but it will serve to test the basic operation of the printer. The get the driver ROM I can only suggest going to a good dealer they might be able to help.

**Dear AUI,**

Can you please advise me if a colour monitor I have recently acquired would be compatible with my Amiga 500. The monitor is approximately eight years old and is made by Hantarex. There is no model number or other identification.

The input to the monitor is through a 9 pin D socket. I have tried contacting Hantarex for their advice and they did send me a circuit diagram but couldn't help on the suitability for use on the Amiga I need your help!

**Bryan Duffin,  
Wirral.**

**Dear Bryan,**

*You will need to connect up the Horizontal and vertical sync to the correct pins, but if you are not happy in doing that, contact someone like Trilogic, who are very good at monitors. It would help them*

*if you sent them a copy of the circuit if they agree to make up the lead that you require.*

*There may be a small problem, and that is if the monitor is a digital type, that means that it will only display a very limited number of colours ( eight in all ) but if it is analogue it will display all the colours, again that can be worked out from the circuit.*

**Dear AUI**

I am the proud owner of an Amiga 2000 with an XT Bridgeboard. I also have a 30 Mbyt hard disk that is partitioned 50/50 between the Amiga and the PC.

When I switch my machine on I fail to get the classic hand holding a disk symbol. In order to get the computer to respond I have to press control A-A several times. I have tried several variations of my switch on routine. I have had the most success by turning the machine on an off at 10 second intervals, however I am concerned as this method is not in the manual and I now have a very sore finger. I am anxious to solve this problem as it is my plan ( long term ) to buy an autoboot hard disk, and fear that it will not work with this obstacle.

Around april last year you mentioned in reply to a letter that someone was working on a utility that will transfer FFS files to PC.Pic files, any news please?. Also why is it virtually impossible to obtain upgrades for Amiga software. I have Citdesk ver 1.1 which I enjoy using, of course the package has been updated but I have seen no upgrade for existing owners. This only seems to be a problem with Amiga software, it seems unfair that existing owners should have to pay the full price as it was their money and interest in the product that allowed for the resourcing on the newer version.

**Bob Cook,  
Stepney**

**Dear Bob,**

*you do not say what side the drive is on, ie is it a PC type drive or is it an Amiga drive??*

*Firstly pull out the hard disk and the BB, then try to boot the machine. If you have no problems then the fault is with the drive or BB. You might have a loose chip, don't laugh it is a very common fault especially with the Fat Agnus chip. have them reseated. It sometime happened that the edge connectors on the expansion cards can get a bit tarnished, you might find that pushing them in and out of the sockets will cure the problem. If that fails it will mean a trip to the repair shop I'm afraid.*

*There is no such format as FFS for graphics, FFS is the FastFile System, or do you mean IFF??, if so there are quite a number of utilities floating about that will convert between a number of formats. pic might be one of them. You will find several on CIX so it might be worth a look on your local BBS or in the latest PD libraries.*



As to upgrades of software, I have found the opposite, in that various Amiga software has been offered to me several times as an upgrade. Have you asked for an upgrade? So far I have had upgrades/Upgrade offers for: WB1.3, Photon paint, CanDo, Lattice C, Hisoft, Fbasic, X cad, Arexx, DigiView, CygnusEd, There is also an upgrade for the Protext WP, and I think for the Superbase programs. That's not a bad list at all, especially as that is just from my own personal use!

**Dear AUI,**

It has taken me several months to decide which magazine to buy and I have found yours to be the most relevant, I have tried to buy the two books: Mastering AmigaDos 2, Vol 1 and Vol 2 by Bruce Smith and Mark Smiddy. I have not been able to obtain these books from any bookshop in the Southampton area. Could you please tell me how I can obtain copies.

Also I wish to learn Cobol and Pascal. Is there any software of this type for the Amiga 500? If so what are they called and where can I buy them?

Lastly I have the virus killer Terminator, is there any other virus killer I can buy because I have found it does not kill a virus called byte bandit? Once again how do I get hold of them?

**Mrs E. Ship,  
Southampton.**

**Dear Mrs Ship,**

You can obtain the books from a BOOK-SHOP, by that I mean a shop that sells books, not a combined newsagent or even a computer shop. There are several bookshops that come to mind, Foyles, Dillons, The Modern Book Company, Books etc, I had a quick look in my local bookshop James Smith and they did have one of the books you mention, they also offer a bookfinder service and mail order. James Smith is on 071-278-9080 (London Office) and 081-591-9090 (Barking Office). What you need to do is give the bookshop as much information as possible, The Title, Authors, Publisher and ISBN. The ISBN is very important, if you have that then it will uniquely identify the book making life very easy. Once the bookshop has that information it should be a simple matter for them to get the book for you. Another thing to do is look through the Yellow Pages for bookshops in your area.

Pascal is really a teaching language, and has been superseded by Modula 2, but there are many Pascal programmers about. I do not know of any commercial compilers, but there is a PD Pascal available. Try AUI Feb 91 page 55 Top left box for a supplier.

Sorry I've not seen anything of a Cobol compiler, perhaps another reader knows of one?

Virus killers, there are dozens about, I'm not going to go into them here, Erik Lovendahl did a really good feature on them in AUI Feb 91 page 88. I will say this, how did you get the virus in the first place. The real cure is to ensure that you know where your software comes from. I have only had one infected disk

( from an AUI reader! ) which I caught with VirusX. PD libraries, user groups, and some shops stock all manner of virus killers.

**Dear AUI,**

As a very new comer to the Amiga I must congratulate you on an excellent magazine. Being in Germany on duty we cannot seem to locate the 23 way D types needed for Amiga disk drives. Can you advise a mail order address please?

**Shane Williams,  
RAF Gatow**

**Dear Shane,**

Give Trilogic a call, they stock the 23 way D types. Ensure that you state the sex of the required connector ( male or female) These connectors are also used for the Amigas video output, and if you want to connect a Sony television to the Amiga the Trilogic have a lead that will do that as well.

The 23 way connectors cost £1.99 each including covers.

Contact Trilogic, Dept A.U.I., Unit 1, 253 New Works Road, Bradford, BD12 0QP. Tel 0274 678062, Fax 0274 600150

**Dear AUI,**

At the moment I am not such a proud owner of a Commodore Amiga computer system.

Problem:- Commodore MPS 1270 Inkjet printer.

I find that I am unable to obtain a plain paper printhead cartridge for this printer, which in turn means when this cartridge runs out the printer will be completely worthless and useless.

I have tried all avenues, but without success.

Any advice or suggestions would be more than welcome.

**Chas Dainty,  
Essex**

**Dear Chas,**

I drew a blank on this as well, sorry I can't help with a supplier at all.

Commodore do not make printers, they rebade others, the MPS range tend to be Epson printers sometimes with a modified software control program. It just might be that when your cartridge runs out you will be able to compare it with some other cartridges. Epson would be my first bet, followed by Cannon, and then Brother.

If any reader knows of a source of these cartridges please let AUI know.

**Dear AUI,**

I am the owner of a Star Laser 8 II and I have one serious problem that you may be able to help me with.

When using the printer to print Pagesetter 2 pages or to print wordprocessed pages, I only have 66 lines not 70 lines (full A4).

I believe the problem is the printer driver ( WB1.3 states that the print area is 8 by 10 inches i.e. 66 lines.

However, full A4 pages must be possible

because I have seen samples in magazines.

Please advise, is there a full A4 HP laserjet driver available, or do I need to alter the existing driver?

**O. Sanderson,  
Sunderland**

**Dear O. Sanderson,**

You have come across one of the silly incompatibilities between the UK and USA. 66 lines is the standard for A4 there. Lasers have a problem in that they cannot normally print over the entire A4 page, but you might be able to fool the printer by messing about with the preferences settings. I did see some messages on CIX about this problem, and someone did hack the driver about. It did work but I think that there were some problems that caused the print to go astray sometimes.

**Dear AUI,**

Please help, I have acquired VisiCalc from the Public Domain to use for semi-serious work, but unfortunately there is a major hurdle I need to get over. One of the necessities required from the spreadsheet is the ability to print. It would appear that VisiCalc either has a bug in it or the author has put some protection of this area. Having purchased the software as PD, I am not aware of it being 'shareware'. When trying to create a file which is in a printable format, the message "Can't create Ny" always appears. This really is infuriating as I have come to terms with the operation of the spreadsheet, and am more than happy to continue using it. I have tried everything within my capabilities to overcome the problem, but have failed. If you or any of your readers have managed to overcome the problem, I would be happy to hear how.

I am writing to you because I have read all the other specialist Amiga mags and your responses to readers queries are the most helpful. Often people with a problem have nowhere else to turn and I have found that other mags actually avoid answering the question, and turn to cheap wit, just to enlarge the publication. I am therefore hopeful you can help me.

**David Mullins  
West Yorkshire**

**Dear David,**

Sorry to hear of your problems, I do not know how to solve them directly, as I do not have a copy of that program in my library. If you still have problems after these suggestions pop a copy of it in the post to me care of AUI and I'll have a poke about with it.

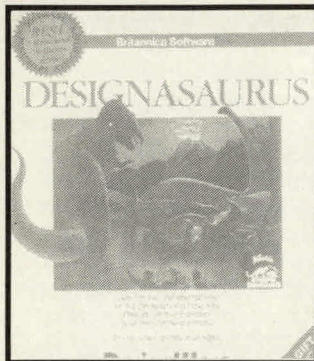
Generally spreadsheets need to be told exactly what to do, and the message can't create Ny ( whatever Ny is ) indicates to me that some information is missing.

If I print from Lotus, or Superplan, I would normally shade the ranges I was interested in first and then print out the sheet. You may have to specify the range in the print command ie Print A1..H14, or some such arrangement. You might also have to set up a printer driver selection before things will happen. (this is a common problem on other machines, but not quite so on the Amiga). Sorry I can't be of more aid, but as I have said send me some more info and I might be able to be more helpful.





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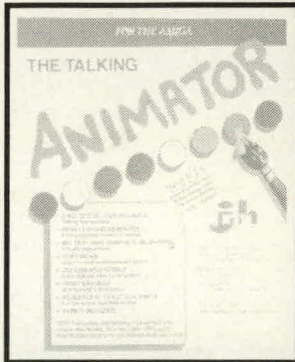
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# WRITE TO REPLY

*This is where you get your chance to speak  
— or write — your mind about what's bugging  
you — or your computer. Bud Vennos fields the  
bouquets and the brickbats.*



**Dear AUI,**

Congratulations for having the nerve to print a 'Write To Reply' column. Also, congratulations for being the only UK Amiga magazine to recognise the fact that the Amiga is not only being bought by pimply teenagers who are solely interested in visiting death and destruction on massed hordes of pixelated aliens, there really are people interested in programming the machine and using serious applications! Most magazines seem to ignore this and fill their pages with games reviews and lurid advertising. Keep up the good work!

O.K. that's the crawly bit out the way. Now for the meat, gravy, vegetables, lightly sauted potatoes, and little sprig of parsley of this letter. Why, oh why is the presentation of your magazine so awful? I don't just mean all the typos (this seems to be getting better) or the reversed pictures, but the house style. Yuk! Yellow text on a black page? Black text on lurid yellow?? White on purple??? Yellow on green? Green on yellow? Aaaaaaaargh!!!

Is your department completely colour-blind or are you just taking the well-known? Come on guys, give us a break. What's wrong with a nice, clean, restrained house style that reflects the serious content? Take a look at the US magazine Amiga World - clear, slick, serious, and, above all, professional. If the Amiga is to make it as a serious machine it needs to be presented to the public in a slick and

professional way. So, as the only serious British magazine catering for the Amiga isn't it time you started taking your responsibilities seriously?

I only buy two Amiga magazines these days - Amiga World and **AUI**. **AUI** is the pick of the bunch for its mix of articles and authority, but it's at the bottom of the heap where presentation is concerned. This is a pity as looks unfortunately count for a lot.

And no, I'm not going to stop buying **AUI**. Now, where did I leave my sunglasses?

**Julian Barkway,  
Cheshire**

P.S. Is there intentional irony in presenting a spelling-checker as a running project? **AUI** March: Supplementary (Supplementary), Imaginitive (Imaginative), deviancy (deviancy), gorey (gory).. and so on. I take it that the spelling-checker has not yet been tested.

**Dear Julian,**

You congratulated us, so it is fitting that we congratulate you of having the nerve to Write To Reply. Also, we have awarded you with a star letter prize for highlighting some of our deficiencies. Our Consultant Art Editor, and he does stress that he is merely a consultant, is personally delivering your goodies. Watch out, he's a big lad. Thanks for supplying your full address.

Of course, we do realise much of what you are saying, and we would agree with many of your valid points. Over the forthcoming months you will be subjected to the new-look, enhanced **AUI**, but we wish to study carefully so that the changes we make are improvements and not differences. Until then **AUI** will stay as it is, but we will try to tone down the bright colours which have brought summery, cheery, thoughts to many during a cold, bitter, winter.

As for the spelling mistakes, I don't think you can complain too much, as most of these are typographical errors which means that often in the last hurried days as we go to press, we do not proof read with sufficient thoroughness what our typesetters have done. But that, as you

point out is our fault. And, no, the spell-checker is an independant project which is being developed as written, but I am told it will be ready soon.

**Dear AUI,**

Having just purchased an Amiga I am interested in learning as much about it as I can. I was interested in joining the U.K. Amiga Users Group. After seeing the advert in **AUI** January I telephoned them, but was told that they no longer operate. In the March issue of **AUI** they were advertising. Can you say whether or not they are still open for business. Also in the MArch issue there was an article on the Amiga Graphics Starter Kit. Can you tell me where I may get it?

**Bernard Daley,  
Cleveland**

**Dear Bernard,**

After enquiring into your plight we contacted the UKAUG and were informed that due to lack of support they were, for this year, not taking on new members while continuing its service for existing members. This is to ensure that current members are not subjected to a reduced service from them. Why don't you try ICPUG on 081-346-0050.

The Amiga Graphics Starter Kit is quite a collection of art/design programs and can be purchased from Oxxi (USA) on 010-213-427-1227.

**Dear AUI,**

I like the format of the magazine as it is a lot cheaper and much better than the rest of the Amiga magazines.

I have been programming my A500 for 4 years. The first 3 were spent discovering how utterly useless AmigaBASIC is. Now, I have seen the light and use assembly, which I feel to be easier to pick up than the C programming language. With the invaluable help of Devpac 2 and the Hardware Reference Manual I have written a few utilities and games. I have had some good ideas for scrolling arcade games, but am surprised by my inability to scroll a screen and move loads of BOBs around. I can easily scroll a screen, but have difficulty in moving BOBs efficiently around the screen without using the system routines.

I notice that other Amiga magazines (no names mentioned due to copyright laws..Ed.) provide tutorials with the source on a coverdisk. If it is popular with other readers could you do the same even if it means that they supply the disk as an extra.

You said that in an earlier issue that your QUAD series was popular - I certainly liked it. If you did take this approach then you'd be helping your readers to become mega-ace programmers!

**Anon.,  
Chippenham**



**Dear Anon.,**

*I hope you don't mind me naming you Anon. as you did not supply your name (tut, tut) - all that excitement associated with writing a Write To Reply. To answer your question in a single go I shall start by saying that previously we decided not to run long programming tutorials on assembler due to the problems encountered with them. Listings generally seem to be ignored, mis-typed, and generally more trouble than they are worth, but since we are considering adding a covermounted disk in future we would be able to include source and code programs on the disk to co-incide with the tutorial inside the magazine.*

*All we need now is to find competent programmers who can spare time of their busy schedule of programming games or demos to write such articles. We have a few in mind, but we would be happy for readers of the magazine participating in what goes on the disk. For that reason we will be looking at readers' submissions, i.e games, utilities, tutorials etc..*

*Readers who have useful utilities (including an assembly language BOB routine) can send submissions to us for inclusion on possible future disks.*

**Dear AUI,**

As regards the **AUI** Grooves guide to all about music issued with February's issue. It states that "You can't use both IFF sounds and MIDI directed output together, so you will not be able to have Amiga sampled sounds playing along with your MIDI gear (unless you've got two Amiga's)".

This is incorrect as you can have output to MIDI gear as well as the internal samples. Just copy the internal sample track in the sequencer page to a spare track then click on EXT instead of INT (internal) and the track will play your MIDI gear on the same MIDI channel as the internal sample. If you want the EXT track to play on another MIDI channel just enter the bar editor, choose Select All, then click on the MIDI channel you want (in the MIDI box at the bottom of the page). When all the notes change colour, store the sequence back to its original place in the sequencer page or, alternatively, to a spare track.

P.S. How about an article on writing Music X protocols? I need a protocol for my Korg M3R, can anyone help? Thanks for a great magazine.

**Kevin Baines,  
Cleveland**

**Dear Kevin,**

*On behalf of all our readers and ourselves thank you for your help in highlighting areas of specialist subjects which are lost while undertaking such large projects, such as the Grooves supple-*

*ment.*

*Music X protocols seem to be a tricky subject for many Amiga musicians, and **AUI** may cover it in a future issue, but if any user out there can help then I'm sure that Kevin, and many more readers will be grateful.*

**Dear AUI,**

As a newcomer to the Amiga 500 world, I thought I'd write to you for some help.

What I would like to know is where I can find a machine code assembler and disassembler for the Amiga? How much it costs? And can I load other peoples machine code programs with it, alter it and save it again?

A point I would like to make is that after looking through all the Amiga magazines I found **AUI** to be the most interesting of all due to it covering a wider range of topics to suit everyone's needs, including my own.

I would also like to say that in the February issue of **AUI** Mr.A.Tulip of Mansfield complained about too much advertising in the magazine. Rubbish! I suspect there are more than just me who enjoy reading advertisements, especially when you can buy hardware and software a lot cheaper than directly from a computer store.

**Graham Howe,  
Mablethorpe**

**Dear Graham,**

*As you are a newcomer I would suggest that you look through the PD libraries to find an assembler/disassembler and a beginner's assembly language guide for you to experiment with before you spend money on a commercial package - the best of which is probably Hisoft's Devpac. Devpac is about £50 and has an assembler and a debugger which is not a fully fledged disassembler. If, as I suspect, you only want the programs to "crack" into other people's programs and modify them then this is not legal without their permission.*

***AUI** has many contributors who are proficient in their subjects and is part of the reason that **AUI** is so topical. Another is that **AUI** is the longest standing Amiga UK magazine and has a wide respect throughout the industry and sometime receives review products and material which other magazines do not.*

**Dear AUI,**

I would first like to say that as a new Amiga owner that I am impressed with the quality of your magazine, although I feel it would be nice to have a cover disk included. I feel sure your readers would be prepared to fork out a little extra cash for such a disk if useful utilities were included.

Anyway, down to business. The reason I have decided to contribute to **AUI** is to comment on Mr. Kayani's letter in the

April edition, in the Write To Reply column. I was the proud owner of a Commodore C64 computer for many years, but last year I decided to upgrade to an Amiga (a decision I have not regretted). I bought a copy of your magazine and rooted through the advertisers and found a company called MR.Diamond. I telephoned my order through and received a battered box the next day. On checking the contents I found to my dismay that the PSU was broken and half the contents were lost. I made a phone call to MR.Diamond and within three days I had a complete new computer package delivered to my door.

I feel sure if Mr.Kayani had been straight with the shop in the first place he would have received the first class service that was afforded to me.

**P.Johnson, Chinnor**

**Dear Mr.Johnson,**

*Thank you for sharing your experience with us. Since we published Mr.Kayani's letter he has been back in touch with us and seems to be happy with the service from Diamond. In our dealings with Diamond we have found them to be fair and honest advertisers.*

*As for your first comment about having a coverdisk was covered earlier when we mentioned that we will be considering one for future issues.*

**Dear AUI,**

I would like to bring to your attention a mistake published in the February issue of **AUI** on page 12. The mistake was the articles on the Citizen's budget 24 and the Tiny Drive in the Newsfile. You had photographs mixed up!

I only bring this to your attention in the hope of a prize, but if not I tried. No doubt this has already been brought to your attention, but as I am currently serving in the Gulf and mail takes an age I thought you'd make an exception.

Could I also say what a great magazine you put out for your readers and I think that you have just got it right. Something for everyone and not as Mr A.Tulip writes. I for one look forward to reading the copies I have awaiting my return from the Gulf.

**BDR. Launder,  
A Desert Rat,  
The Gulf**

**Dear BDR. Launder,**

*Although we only received this letter after the war was over we thought that it was worth printing because of your comments. No prize I'm afraid, but I bet you are glad to get home to your mounting collection of **AUI**s.*

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\*Actual unretouched digitised screenshot\*

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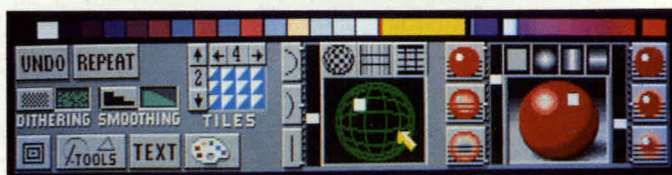
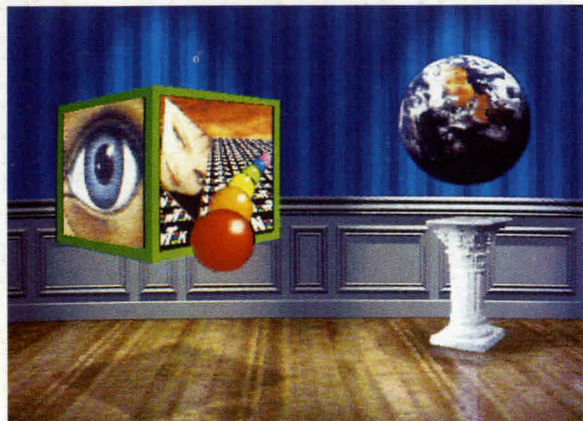
Digi-Paint 3 works in the Amiga's powerful Hold And Modify (HAM) mode, which allows you to paint using all 4096 colors simultaneously. By comparison, Deluxe Paint III (by Electronic Arts) operates in less sophisticated modes, restricting you to a maximum of only 64 colors. Advanced features available in Digi-Paint 3—including Colorizing, Variable Transparency, Shading, Lighten, Darken and Range Painting—are simply not possible in Deluxe Paint III due to its 64 color limitation. AMIGAWORLD warns, "Competitors may want to head back to the drawing board, because Digi-Paint 3 is hard to beat!"



### "What makes Digi-Paint 3 better than other HAM paint programs?"

Digi-Paint 3 is the only Amiga paint program written in 100% assembly language. Although challenging to program (taking up to 10 times longer than other computer languages), it's the only way to achieve the incredible speed found in Digi-Paint 3. AMIGAWORLD calls it "the fastest HAM paint program yet" and AMIGA SENTRY estimates it's, "6-10 times faster" than the nearest contender.

Other advanced features found *only* in Digi-Paint 3 include: anti-aliased texture mapping, anti-aliased fonts, ARexx support, 1024 x 1024 super bitmaps with auto-scrolling and dithering to 30 bits per pixel (over a billion colors internally, giving you tens of thousands of apparent colors). COMPUTER SHOPPER magazine reports "Digi-Paint 3 is without a doubt the most advanced HAM paint program to date!"



### "But is Digi-Paint 3 easy to use?"

I've learned that no matter how powerful a program is, if it's not friendly it's not worth my time. We designed Digi-Paint 3 with all users in mind—from the beginner just starting out with computers, to the "power user" who demands the most advanced features possible. The spiral-bound manual contains a step-by-step Guided Tour, 11 hands-on tutorials, a color coded reference card, and almost one hundred example photos.

Digi-Paint 3's intuitive user interface was created by Digi-View designer (and NewTek Founder) Tim Jenison and renowned Amiga artist Jim Sachs. It features innovative "Dashboard" controls which AMIGAWORLD regards as "a joy to use" and "very easy to learn and understand". INFO MAGAZINE says the new interface "looks great and works logically".



### "What is the Transfer 24 program included with Digi-Paint 3?"

Transfer 24 is a separate program disk included in the Digi-Paint 3 package, allowing you to alter any picture's brightness, color saturation, contrast, hue and sharpness, almost as easily as adjusting the controls on your television set. Transfer 24 also lets you modify the size, palette, and resolution of any picture. These powerful features, known as "Image Processing", give you incredible control over your final artwork. You can also save your image in any of the Amiga's 24 resolution modes (up to 768x480) making it compatible with all Amiga graphics software. AX MAGAZINE notes that "Transfer 24 gives you even more options as to the final appearance of your work". AMIGAWORLD declares, "Transfer 24 is great for making overall changes."

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