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APRIL 1989

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A photograph of a Commodore 64 computer setup. The main unit is a dark grey plastic case with a keyboard integrated into the top. A separate keyboard is visible behind it. A white mouse is connected to the side of the unit. In the foreground, several game boxes are displayed, including 'The Great Escape', 'The Last Ninja', and 'The Great Giana Sisters'. A pink rectangular overlay in the top right corner contains the text 'COMMODORE FAMILY ENTERTAINMENT' in white, bold, sans-serif capital letters.

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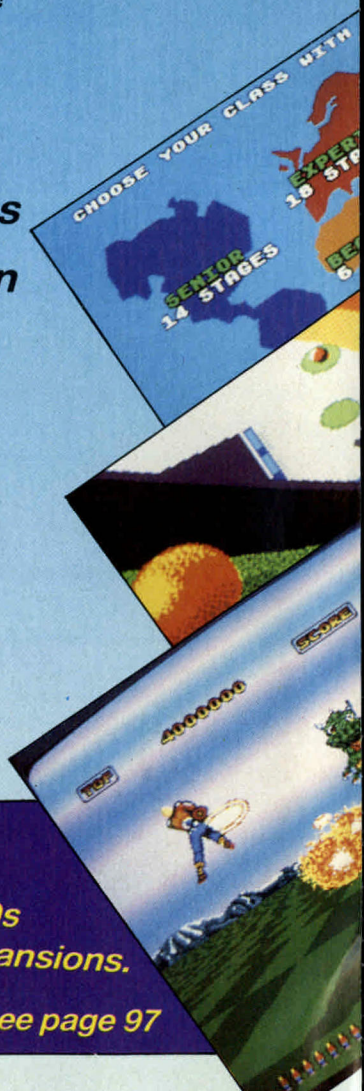
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THE AMIGA DIMENSION

A leading Amiga hardware supplier announces a DTP development that puts 16 million colours available for Amiga DTP users. A designer who was quite content with his 1 Meg Amiga before finds, when he tries a 2 Meg expansion, he cannot live without his new addition to satisfy his graphic needs with the extraordinary new Photon Cell Animator. Not one, but three really hot new games hit us all on the same day. We receive a report of a school in the U.K. that has 30 Amigas and a small U.S. company announces it has already 40 educational packages of educational software available for the Amiga.

DTP ... Professional Video ... Entertainment ... Education ... The pace is clearly quickening across the whole breadth of the Amiga Dimension. Everywhere the Amiga is moving into higher gear. Improvements, advances, innovations are seen in every issue of **AUI** these days. Our pages are in ever greater demand. The speed of change has suddenly accelerated.

CBM is beginning to approach the DTP market, moving as yet quietly up the route so successfully taken by the Macintosh – at a fraction of the cost of the Apple machine's system. Every day more professional, and amateur, video makers discover that the Amiga can offer brilliant, simple solutions to complex and previously much more expensive problems. Even with the 8, not 2 Meg, which the Photon Cell Animator really needs to exploit its tremendous capability, an Amiga system still costs less than a quarter of work stations of comparable power. It is not surprising that the whole video world is starting to give the Amiga a very warm welcome.

In the games field, all major products are now being written for the Amiga, in some cases first created on it – a very different situation to just a year ago.

"I could kill Commodore", the boss of a small but longtime established U.S. software company said to me. "They just let Apple take the American educational market for years!" But now he has announced he has over 40 educational programs ready as CBM moves into the schools and colleges of the U.S.A. as they are into the educational sector in Europe.

What has brought about this powerful change in the Amiga dimension? Well, the late Arthur Koestler wrote about there being a climate of scientific development in which the same revolutionary discovery would be made in several different places at the same time – an interesting variation of the 'Critical Mass' concept.

Perhaps there are simpler explanations. The Amiga, though friendly to use, is by no means so easy to create for. The developers or programmers are now coming into their fourth year of practical work on this marvellous but difficult computer. They have passed their apprenticeships and the angle of their learning curve is becoming steeper. Even Lattice has reached 5.0!

There is another factor too. About now, or within a short time, no-one, probably not even Commodore will know exactly, the one millionth Amiga will be sold. With a market that size, they are no longer dealing with a minority interest. For the Amiga is probably already one of the world's ten best selling computers ever. With that critical mass, it is no wonder we are seeing a speeding up of development. What is sure is that success, in computers as in anything else, feeds on itself and will ensure that it does not take anywhere near so long to achieve that second million of Amiga users.

Antony Jacobson
Managing Editor
and Publisher

We are sorry that we cannot deal with technical enquiries by telephone, but we welcome letters from readers.

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Digi-View Gold

New Tek, Inc., makers of the award winning Digi-View video digitizer, recently announced the release of Digi-View Gold, the new and improved version of Digi-View designed specifically for the Amiga 500/2000 line.

The redesigned hardware for Digi-View Gold offers better image quality by operating directly with the Amiga 500 or 2000 family of computers, with no Gender Changer required. "The new hardware design relieves interference in the system", said Tim Jenison, president of New Tek, "and as a result the final image is improved." Digi-View Gold also works with the Amiga 1000.

The filter wheel for Digi-View Gold has also been redesigned to use professional photographic gels for cleaner colour input and greater ease of use. The version 3.0 software (included with Digi-View

Gold) features line art mode for true two colour digitizing for sharp logos, extra halfbrite mode and overscan digitizing for professional video use. Digi-View Gold's powerful image processing supports all Amiga resolution modes. Digi-View Gold also contains New-Tek's exclusive Enhanced Hold and Modify mode for 4,096 colour (all at one time) photographic quality images.

Digi-View Gold is fully IFF compatible so that all images captured can be used for desktop publishing, presentations, or video. Digi-View Gold captures images in 2.1 million colours, the highest resolution of any Amiga digitizer, and includes the ability to remap pictures between all Amiga resolution modes.

The new Digi-View Gold package with the redesigned hardware, version 3.0 software, new filter wheel and manual remains at a suggested retail price of \$199.95. Contact: NewTek, Inc., 115 West Crane Street, Topeka, KS 66603. Tel. (913) 354-1146.



MI Tank

Microprose Software Inc., is preparing to tread new ground with the release of a simulation of the 60-ton MI Abrams, the brand new main battle tank of the U.S. Army. To be released in the Summer of 1989 for IBM-PC/Summer/compatibles, the yet-unnamed tank game has already absorbed more than a year's software R&D effort. Designer Arnold Hendrick, well-known

for his work on F-19 Stealth Fighter, Red Storm Rising and Pirates!, explains that accurately portraying movement over uneven terrain presents major software engineering challenges.

Microprose claim it is using authentic information from three Army manuals because they "want this simulation to be done right."

The tank combat simulation will support the VGA/MCGA, EGA, CGA, Tandy and Hercules graphics modes, and will

Kings Of The Beach

Electronic Arts has announced the release of *Kings Of The Beach*, the first world tournament 2-person professional volleyball computer game. The program has been designed with the help of two of the players from the U.S.'s number one team, Sinjin Smith and Randy Stoklos, and gives the player the opportunity to travel the world to become "King Of The Beach".

Smiths and Stoklos - today's reigning kings of volleyball, have a unique style that is accurately depicted in the game. The player can practise his spikes, bumpa and sets with the kings themselves to prepare for the 20 challengers that await - from wild maniac rookies to other AVP pros.

The game takes the player to

some of the world's greatest beaches from Australia to Hawaii and Rio. As the player progresses through 15 gruelling matches he will meet new and tougher opponents in his attempt to become "King of the Beach".

Spike, the players' official beach escort will make sure the player gets to all the right places. Exclusive "Pixel-Mate" pin-ups will register the player in the tournaments and share required passwords to proceed through the game.

Kings Of The Beach supports CGA, MCGA, EGA, VGA, Tandy 16 colour graphics mode. The program features a number of skill levels from beginner to advanced and is for one to two players.

Price: £24.95 (available for IBM only).

Contact: Electronic Arts, 11-49 Station Road, Langley, Nr Slough, Berkshire SL3 8YN. Tel (0753) 49442.

R.I.P. G15

Some people are awed by the size of the woolly mammoth as compared with today's elephant. And in a billion years, perhaps we may see even smaller versions of that beast cantering around our living rooms.

But what does this have to do with Computers? Well you may now see the world's first PC, the G15, better preserved than a mammoth, at the Smithsonian Institute museum in Washington DC.

The G15, built 34 years ago by Harry Huskey, now professor emeritus at the University of California, is the size of a refrigerator.

It used 250 vacuum tubes, required 30 to 40 ASmps of power - more than 30 times as much as today's PCs - and needed a rotating magnetic drum for storage. With 12KB of memory, it used Huskey's own programming language, called Intercon, and cost \$50,000 in 1954.

be hard disk installable with a key disk copy protection routine. Use of a joystick will be optional, and 384K of RAM will be required. Contact: Microprose, 2, Market Place, Tetbury, Glos GL8 8DA. Tel: 0666 54326.

Mindware BBS Introduced

Mindware International of Ontario, Canada, has set up a new in-house electronic bulletin board system offering technical support, useful utilities, and on-line conferencing and data exchange with other users for registered owners of Page Flipper Plus F/X and Page Render 3D.

Instant product upgrades will also be available via the new BBS. According to Andy Thut, chief programmer in Mindware's development division: "New features are being added to our products so fast that there was no better way for everyone to keep up with the changes." The latest version of PageFlipper Plus F/X, for example, now has over 100 new features not present in the first release last August.

Registered owners of all Mindware products can now access the Mindware BBS at no charge by calling 705-737-5017.

Contact: Mindware International, 110 Dunlop St, West, Box 22158 Barrie, Ontario, Canada L4M 5R3. Tel. 705-737-5998 (voice).

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Philips 8833	£204	Pace Series 41200S	(C) £312
Taxan 770 + M/Sync	£433	Pace Series 42400S	(D) £381
		KEY:— A = V21/V23	
MODEMS		B = V21/V22	
Amstrad SM2400	(D) £197	C = V21/V22/V23	
Dataflex Quadcom	(D) £238	D = V21/V22/V23/V22 BIS	
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MDS Printer Stand

Custom-made computer furniture specialists, MDS Industries (UK) Limited has launched its new MD system printer stand.

Designed for efficiency, and as part of a comprehensive modular desk system, the MDPS 750 printer stand measures 750mm wide, 710mm high and 750mm deep and has an 18" cut-out in the top; it is suitable for both top and bottom feed printers.

Two chrome plated baskets hook on to the modesty panel to provide an efficient paper feed and catchment facility. The stand is finished in a mid-grey colour.

Two contrasting cable-way mouldings, located on the right and left of the printer stand top, allow cables from peripherals to be fed down through the ducted stand legs into floor or wall sockets.

Optional extras available include 2" castors which can be fitted for mobility, and a channel cable tray.

The products are available either as standard items from the MDS catalogue or they can be custom-made to a company's own specifications as part of the free design service available from MDS.

Contact: Pat Stedman or Keith Dunning, MDS Industries (UK) Limited, Factory No. 1, Ebbw Vale Road, Hemel Hempstead, Herts HP3 9QS. Tel: 0442 231305.

Raider

Impressions has announced its first release, Raider, released in mid March.

Following the death of the Galactic Emperor the Border Raiders have seized the opportunity to rebel and capture eight primary deep space Colonies. They will destroy the Star System unless their demands are met.

To save the Star System, you must fly through a set of four planets and you must kill every turret on each planet before the powerplant (Cog) appears. Tractor up the Cog and fly to the next planet. Once you have all 4 Cogs you appear

Hand Held Colour Scanner

ASDG Incorporated has announced the introduction of the new SHARP JX-100 colour scanner to the Amiga market. The Sharp JX-100 is not only the smallest colour scanner in the world, it is also the first hand held scanner to be made available to Amiga users, ASDG claims.

Working in cooperation with Sharp Electronics Corporation, ASDG has introduced ScanLab/100, a new hardware/software combination that links the JX-100 and any Commodore Amiga 500, 1000 or 2000 computer.

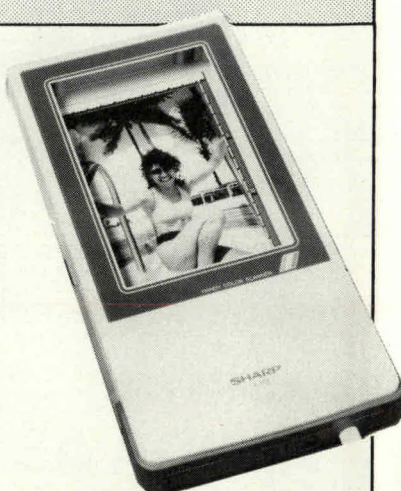
In addition to a proprietary cable that converts the high speed interface of the JX-100 for use on the Amiga, ScanLab/100 will come complete with many of the same advanced colour processing capabilities, virtual memory

and friendly user-interface already used in ASDG's Professional ScanLab.

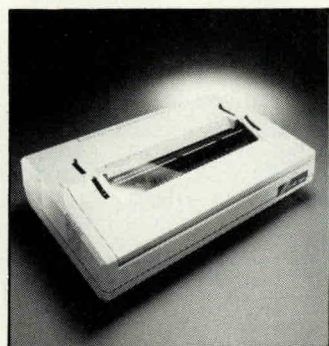
The JX-100 can scan an area of approximately 4" by 6" at 200 dpi. It will offer many of the same capabilities as Sharp's more professionally oriented scanners, including the ability to do black & white, grey scale and colour scanning for high quality desktop publishing.

ScanLab/100 is the latest addition to ASDG's Professional ScanLab family of software/hardware solutions that allow complete compatibility between the Amiga and Sharp's JX-100, JX-300, JX-450, and JX-600 line of colour scanners.

Best-known among Amiga users for such innovative and widely used products as the Recoverable RAM Disk,



FACC II and the first 8 megabyte memory expansions for the Amiga 2000, ASDG's most recent releases include Twin-X, a universal input/output board for the Amiga 2000, and CygnusEd Professional. Price: \$995.00. Contact: ASDG, 925 Stewart Street, Madison, WI 537 13, Tel: (608) 273 6585



Sprint 11/40

Qume has reduced the price of the Sprint 11/40 daisywheel printer to £795 until the end of April. The 11/40 is a robust model which runs at 40 c.p.s. and has a maximum width of 13.2 in.

Up to 100 printwheels can be used with the printer to give different typefaces as well as mathematical and scientific symbols, and foreign languages. Single and dual sheetfeeders are available for printing large runs. Contact: Eric Lee, Qume Ltd, Tel: 0635 523200

in the powerplant.

In the powerplant you gave a limited time period to reach the middle, position all four Cogs and fly out again.

Features: 40 levels, 8 planets, extra level, gravity mode, inverse gravity mode, and an invisibility mode. Available for the Amiga. Price: £19.99.

40Mb Hard Disk Subsystem

Ideal Hardware, the specialist PC mass storage distributor, is marketing a new 40Mb hard disk drive subsystem from Vortex Computersysteme GmbH of West Germany, that solves the problem for Commodore Amiga users of replacing incompatible or redundant disk drives when upgrading their PCs.

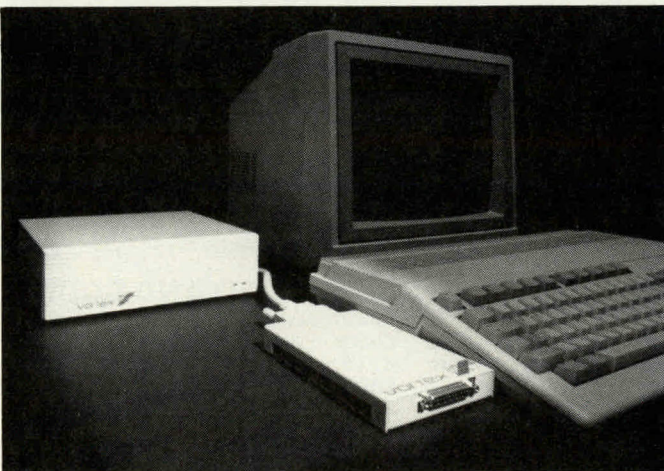
Called the System 2000, it comprises a base unit containing a hard disk drive, a power supply and a controller, and a unique add-on module, called a 'personality module', which provides the interface between the base unit of the subsystem and the PC.

Up to eight System 2000 base units can be 'daisy chained' together to increase

disk capacity, requiring just one personality module. The complete subsystem, including base unit and personality module is priced at £499 and additional 40Mb base units can be purchased for £399.

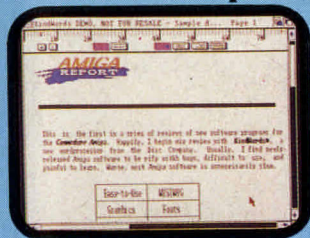
The base unit is configured with a conventional 3.5" hard disk drive with an average access time of 45ms.

System 2000 subsystems can be installed in a wide range of incompatible PCs. Personality modules are currently available for the Commodore Amiga 500 and Amiga 1000, and any PC compatible with a PC compatible expansion slot. Price £195. Contact: Ideal Hardware Limited, Tolworth Tower, Surbiton, Surrey, KT6 7EL. Tel: 01-390 1211.



KINDWORDS

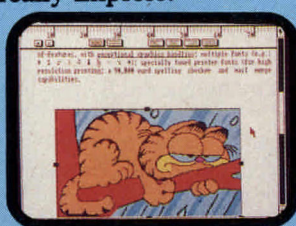
Impressive reviews? They'll be lost for words when they see the new KindWords 2.0. It's still as easy to use as its famous predecessor but now boasts a new



100,000 word English dictionary licensed from Collins, a 470,000 word thesaurus and automatic hyphenation.

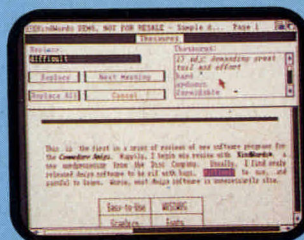
So it knows the difference between 'colors' and 'colours' and how to use them. Because with KindWords you can easily import graphics into your text documents and produce professional documents that really impress.

As it was designed specifically for the Amiga, KindWords works with your computer, not against it. Pull down menus and full help facilities are used to the maximum advantages — so advanced features such as spell checking and mail merging are easily accomplished.



There's a new extensive font library which combines

with graphic editing facilities that make KindWords an extraordinary word processor at an unbelievable price.



Which only goes to prove that sometimes you should believe what you read in the press.

Existing KindWords users can upgrade their software for £14.95 inc VAT by calling 010 331 455 310 53 or write to Disc Company Europe, 1 rue du Dôme 75116, Paris, France. Visa, American Express accepted.

Dealers should call Amiga Centre 031-557 4242, GEM 0279-412441, HB Marketing 0895-444433 or Microdealer 0908-74000.



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"KindWords is stylish and uncluttered... simple and elegant with a lot going for it... KindWords is a program written with care, everything about it shows consideration for the user."

Amiga User International

"I found KindWords both powerful and flexible... I think most users will be delighted with KindWords' logical design and power."

Commodore Magazine

"KindWords Superfonts produce attractive, high-quality printouts even from inexpensive dot-matrix printers."

Amiga World

Price

£49.95
inc VAT.

THE DISC COMPANY



High Density Datalife Plus

Verbatim, the magnetic media subsidiary of Kodak, has announced the extension of its teflon-coated diskettes; DataLife Plus. The concept of teflon coating for data protection coupled with DOS-formatting for ease of use has been extended into the 5^{1/4}" High Density format.

The new Datalife Plus MD-2-HD can be used on PC's and compatible straight from the box, thanks to DOS Version 3.3 pre-formatting at the time of manufacture. Once used the teflon coating protects the data like no other disk can.

Contact: Verbatim Limited, 13 Mole Business Park No 3, Leatherhead, Surrey, KT22 7AQ. Tel: (0372) 37755.

Mindscape signs up Mirrorsoft

Mindscape Inc., one of the leading U.S. software publishers has signed up a North American publishing agreement with Mirrorsoft, at present the top U.K 16 bit software company. The agreement gives Mindscape the right to publish in the United States and Canada multiple titles from Mirrorsoft's recently created Image Works label.

The Image Works line utilizes top European programming talent to create games with outstanding graphics, exciting action, and depth.

The first Image Works product to be released by Mindscape will be Speedball, the futuristic arena sports game

where players use cunning, courage and strength to bribe officials, tackle opponents and hurl a metal ball around a dangerous steel arena.

Speedball, written by the award-winning Bitmap Brothers, will be available in the U.S. in March 1989.

"Image Works looks like it's going to have a really original line of hot new products," said Roger Buoy, president and CEO of Mindscape. "These games are exactly what the American consumer is looking for, and we're excited to be bringing them to the U.S. market."

Mirrorsoft managing director Peter Bilotta added, "Image

Works has had a phenomenal initial reaction in Europe, and I expect demand to be just as great in America. Our previous work with Mindscape has proven them to be a very quality-conscious company; I'm glad they're our partner in the U.S."

Editorial Note: In the March issue of *AUI*, sections of the *MIDI* article were unreadable. For those readers who are interested in the article, please send a stamped, self-addressed envelope and we will send you the complete article by first class post. We regret any inconvenience this may have caused.



youth? Ah, well...), he toured the Pool circuit around Leicester Square and the West End. And it was there that a victim of his playing skills - who lost £6000 to Joe - acknowledged Joe's potential and became his backer.

Nine years ago Joe turned professional after an invitation by the English Pool Association. (They were obviously tired of losing their money and decided to legitimize him!)

3D Pool incorporates a "move around the table" feature - allowing shots to be played from any position; and, you can spin the ball just like in the real game.

Battle your way through the gruelling knock out tournament against such cue happy opponents as Flash Harry, Mighty Mike, Catford Kid and Fast Freddy. You must win three rounds before you can pit your skills against 'Maltese' Joe in the final.

But before entering the tournament, why not improve your skills by playing against a friend and practicing your trick shots. Alternatively, sit back and suss out your opponents during their practice sessions.

3D Pool will be available for the following formats on the 18th April:

Commodore 64 (Cassette) £9.99; Commodore 64 (Disc) £12.99; Amiga £19.99.

DTP Clip Art

The Advertiser's Collection gives over 50 different multi-purpose frames, headers and logo graphics for use in advertising and sales promotion materials. The images can be imported into pages created using any PC desktop publishing software which can accept .PCX or .IMG files.

The Advertiser's Collection graphics can also be loaded into graphics programs such as PC Paintbox, Publishers' Paintbrush and Gem Paint, for further editing.

The Advertiser's Collection graphics are supplied at 72 dpi resolution, but most are of large enough size to allow for reduction.

Use the Advertiser's Collection with: Ventura Publisher; Aldus Pagemaker; Fleet Street Editor; Gem Desktop Publisher; Timeworks Desktop Publisher; on the IBM and compatible PCs.

The Advertiser's Collection images have been developed by Adverkits International, Europe's largest supplier of syndicated artwork to regional newspapers.

The Advertiser's Collection is supplied in .PCX format on one 5.25" disk and in .PCX and .IMG format on one 3.5" disk. Price: £29.99 + VAT.

Contact: Mirrorsoft, Headway House, 66-73 Shoe Lane, London EC4P 4AB. Tel: 01-377 4645.

Maltese Joe Barbara

3D-Pool, Firebird's sports simulation game has been endorsed by the current UK and European Pool Champion - Maltese Joe Barbara.

Four times winner of the London Weekend TV Shoot Pool Championship (1983, '84, '85 and '87), Joe will be featured in the game and on the packaging.

Firebird tells us that Joe started playing snooker during his youth in Malta and continued when he moved to the Isle of Wight in 1967. After discovering Pool in a pub (in his

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This mini-miracle – yes, it *is* no bigger than your cheque or credit card! – lets you store up to 8k of information. It even has a special code to keep your data absolutely private. Megalogic, its manufacturer, tells us that the 8000M is the smallest pocket computer in the world! The 8000M may be very small, but it's also very powerful, with a 20-digit alphanumeric display and 7951 characters for programming.

The recommended retail price for the DataStar 8000M is £24.95. However, through this special offer, you can buy it for only £22.95 – saving more than 10%, and postage and packing is FREE!

So you can get the smallest pocket computer in the world (and it's also a calculator, electronic notebook and an alarm clock!) for £22.95 (including batteries and p & p). No more bits of paper, with the DataStar 8000M, wherever you go, you'll have bytes of vital information right in the palm of your hand.

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Star Laserprinter 8 high specification 8ppm / 300dpi laser, (price inc. 1 year on site maintenance)	£1795.00

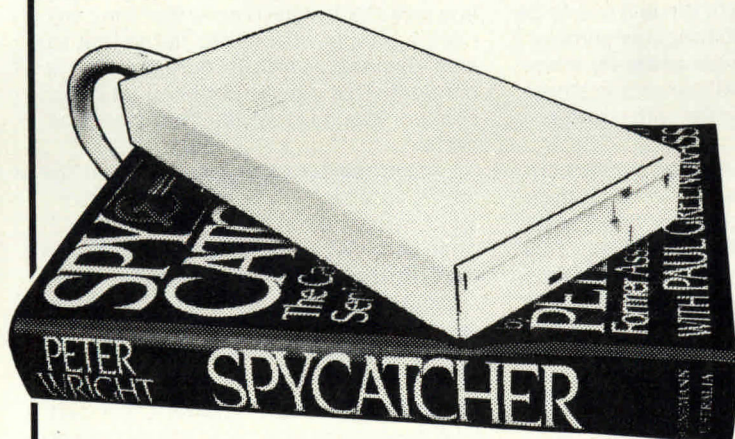
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FutureSound 500

Stereo samplers range in price from the very affordable to the very expensive – but does a high price tag necessarily mean high quality? Stuart Williams reviews one product that may make you whistle a happy tune (and digitise it!) all the way to the bank...

One of the greatest assets of the Amiga has always been its superb sound capabilities. Yet, powerful as the Amiga's four channel synthesiser is, it's useful to be able to supplement the onboard sound with 'digitised' or 'sampled' sounds from outside. Makers of both games and demos have latched onto the various examples of Amiga sampling hardware with enthusiasm, but balancing quality of sampling against price can be difficult. A high price is not always a guarantee of the ultimate in quality sampling - likewise, the cheapest samplers do not necessarily give poor results.

"The manual contains tips on accessing the samples from C, and a full set of routines for using the samples from Amiga BASIC are supplied on the disk. Full marks for that!"

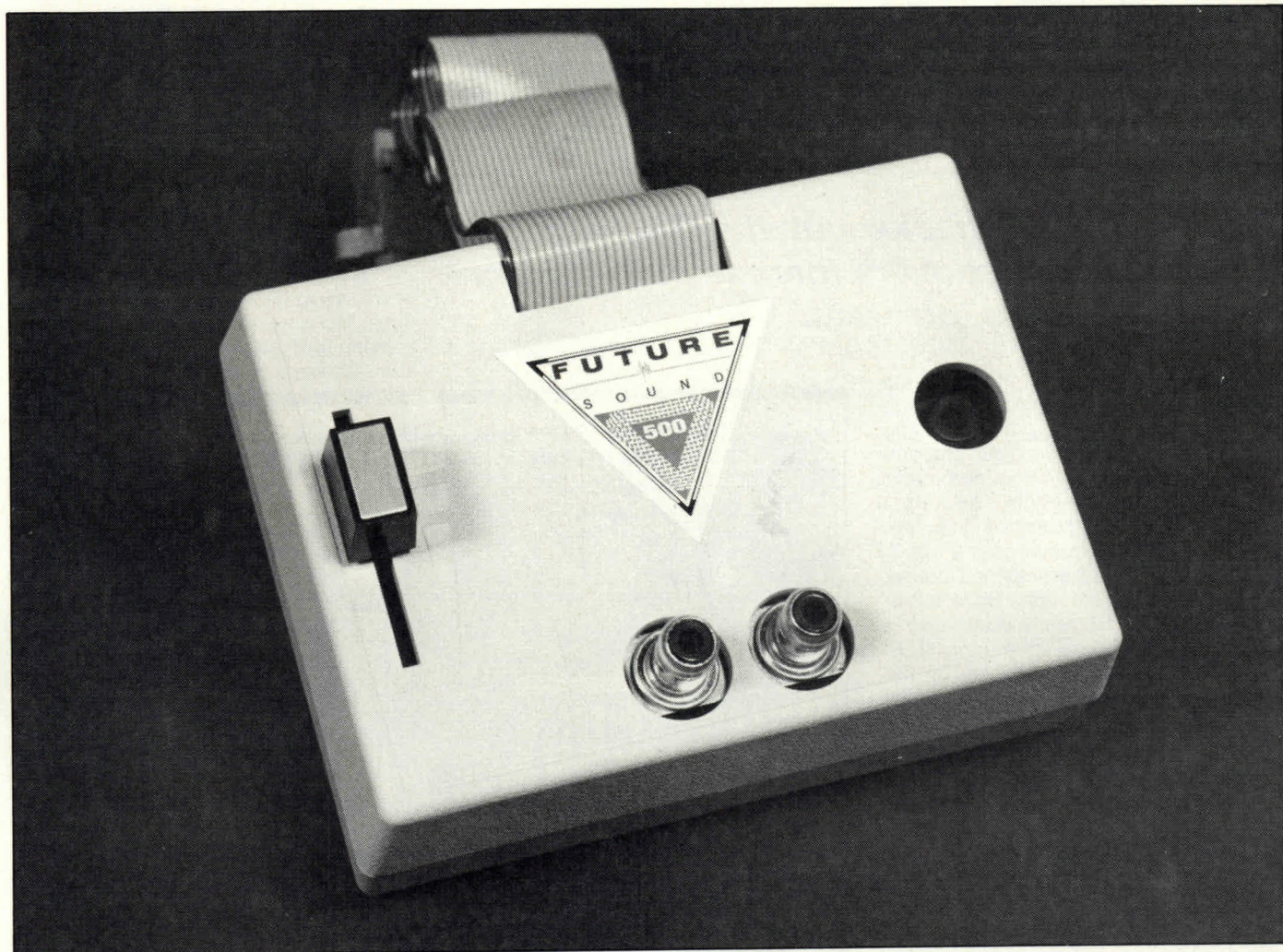
Fortunately, it is now possible to buy a quality sound sampling unit at a new, lower price. The FutureSound 500 was until recently on sale at £175.00. Now,

less wealthy Amiga users can take advantage of its abilities for £79.95 - a saving of nearly £100! While it has to be said that there are still cheaper samplers on the market, they are generally mono; the FutureSound 500 samples in stereo, and as we'll see, comes with some very useful software.

Made in the U.S.A., the sampler comes well packed, complete with a comprehensive manual and a disk of software. The FutureSound itself is solidly built from cream-coloured ABS type plastic, complete with little rubber feet to stop it sliding around your desk. Unlike some budget samplers, which use a simple screw arrangement, the sampler has an audio slider control to adjust the level of incoming sounds - this is a fine adjustment, so don't expect to put fifty watts in and get good results! There are two RCA-type phono sockets on the top of the case, marked L and R - these are the stereo line inputs which can be run from tape deck, record player or indeed any amplified sound source. Opposite the slider control is a 3.5mm (1/8 inch) standard mono jack socket. This is set up as a low impedance microphone input. This is a feature missing from many budget samplers, and ideal if you want to sample voice directly for best quality. The final connection is a 25 way male D plug at the end of about a foot of ribbon cable, which

is designed to plug into the Amiga's parallel port. Owners of the Amiga 1000 (me included!) should note that they will need a gender changer to fit the unit to their machine, as the port configuration is different. This can be supplied (at extra cost!) or made up simply from standard parts.

At the heart of the FutureSound 500 is the TI548, a high speed analogue to digital converter chip. This device takes a rapid series of 'snap shots' of the sound wave as it comes in. It then sends each snap shot, which is consists of an 8-bit number in the range -127 to +127, into the Amiga at a rate controlled by the software. The Amiga's sound system uses digital to analogue converters that can take this stream of numbers and convert them back into the original sound. The sampling rate directly affects the quality of the sound recorded; the more samples taken per second, the better the resolution of the sound. FutureSound is capable of recording at a rate of 42,118 samples per second (almost 42kHz, close to the Compact Disk rate of 44kHz) in mono, but the Amiga's output is limited to a rate of 28,000 samples per second. This makes the highest rates 'oversampling' modes, useful for obtaining the best quality sounds. Unfortunately, even at 28,000 samples per second, your memory will soon run out, so memory expansion will



be necessary if you envisage long samples! In practice, you should set the sample rate according to the type of sound to be recorded; speech and non-hifi sound can be adequately reproduced at 10Khz, and this will be sufficient for most purposes. If you're really fussy, however, the higher sampling rates can give quite remarkable reproduction.

The control software is very good. As you can see from the diagram of the Main Screen, all options are simply selected and adjustments made by clicking on gadgets with the mouse. Unusually, there are four tracks into which sounds may be sampled and played back. Each track is individually adjustable and the playback rates and individual volume levels can be altered at will. The sampling rate is controlled by a gadget at the bottom right of the screen, and an indication given of record time available for the amount of memory allocated (the memory free for use is also shown at the top of the screen). Unlike some other samplers, where controls for choice of stereo or mono, switching between LINE or MIC sockets, and display of recording level (in this case, with a 'VU' meter style display) are part of the hardware, all this is controlled in software from this main screen; this means all relevant controls are to hand in the one

place, which is very convenient.

Sound can be stored either in Chip (main) RAM or in Fast (expansion) RAM, if long samples are required. This option is also switchable from the Main Screen. It is also possible to switch out the low pass audio filter in the Amiga 500 and 2000 from here, which can be useful with some sounds where high frequency response is important. The program also provides an oscilloscope type display of the sound being sampled, which not only moves with the sound input while switched to monitor, but displays the structure of the sound once it is sampled. This makes it easy to select an area of the sample for editing, using the mouse. It is also possible to reverse a sample or a section of a sample, copy all or part of it to another track, and mix samples together. In addition, sections of a sample may be silenced, and sections may be made louder or softer.

Samples can be saved either in FutureSound format, or in IFF format for use in other programs; this is particularly useful if you wish to create instruments for music programs such as Sonix or Deluxe Music. The manual contains tips on accessing the samples from C, and a full set of routines for using the samples from Amiga BASIC are supplied on the

disk. Full marks for this!

FutureSound 500 is a well-constructed unit with sophisticated software. The only addition I would like to see is a parallel port switch box, as like most other units which use this port, it is a real pain having to remove the unit to do any printing! However, this is common among other samplers, so don't let it put you off purchasing this one. Quality of sound is high, and options for manipulation of samples comprehensive. The supplied routines for use of samples from BASIC and C are an excellent idea, and much appreciated. There are cheaper samplers on the market, but the FutureSound 500 at its new price of £79.95 represents serious competition both to the high and low end systems, and excellent value for a quality stereo sampler. I would consider purchase of the FutureSound 500 to be money well spent.

S.W.

Contact: Applied Visions (U.K.) Ltd., Jersey Supreme Works, 538/546 Whippendale Road, Watford, Herts WD1 1QN. Tel: 0923 818078

And it should also be available from all good Amiga stockists.

ICON PAINT

Mark Smiddy checks out the Technicolor desktop and discovers there is more to icons than meets the pointer...

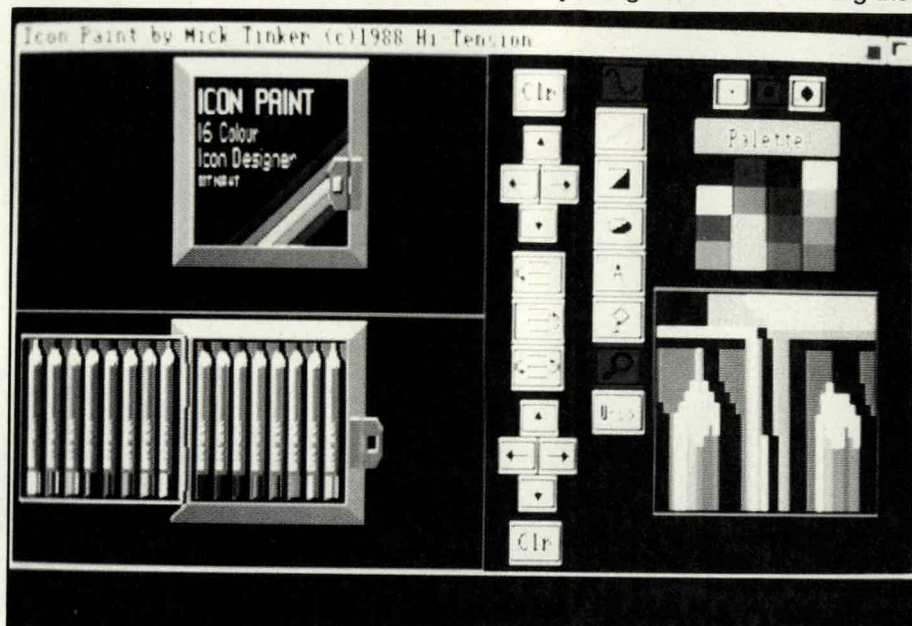
You have the rest of this sentence to work out the following: the Macintosh has a monochrome one, the Amiga has a 4-colour one and the ST has a gaudy 16-colour one – what is it? The answer is – a WIMP desktop. I suspect by now many of you are wondering if my sensibilities are still in order. Well they were last time I looked, but that is a different story. Believe it or not though, the ST really does have a 16-colour desktop, even though GEM makes no use of it. The Amiga on the other hand can – with the aid of this super little package from Hi-Tension.

Icon Paint is a complete utility package to transform Workbench from the drab 4-colour display to a beautiful 16-colour masterpiece. Of course, a 16-colour desktop would be of very little use without 16-colour icons and by definition that is exactly what Icon Paint can be used to create. In fact, it can create almost any icon, in any number of colours from a selection of 2, 4, 8 or 16. The editor is supplied on a single disk with a simple, 20 page manual and a lot of full colour example icons.

The main program on the disk is the Icon Paint editor. This takes the form of a simple drawing package but is specifically tailored to producing icon images. Previously it has been necessary to create icons using paint packages such as Deluxe Paint and to use the Iconmerge utility to create the completed icon. With Icon Paint, none of this is required since both the icon and its alternate image are displayed at all times.

When the program is run, it presents a simple, uncluttered screen consisting of; two icon boxes – the drawing areas, a magnify window, and a set of tool icons. From the project menu, there is an option to load an IFF brush in to either area or load an existing icon image to modify it. Selecting LOAD brings up the familiar load requester, although somewhat strangely this displays all files and directories rather than just .INFO files as you might expect.

Once an icon is loaded it can be edited and re-saved under the same or different name. Loading an icon configures Icon Paint automatically with the correct icon type and number of colours, although it is possible to change the nor-



mal Workbench icons to use more or less colours. In addition, it is possible to specify the type of icon; Disk, Drawer, Project, Tool or Garbage. This ensures Workbench will respond correctly when displayed.

“Various tools are available – including outlined and filled ellipses and boxes, freehand drawing, rubber-banding and three different brushes.”

Drawing icons from scratch is simple – even if you do not have an art package – thanks to the facilities built in to the editor. Various tools are available – including outlined and filled ellipses and boxes, freehand drawing, rubber-banding and three different brushes. There is even a rudimentary magnify feature for adding fine details to your creations – most of the other features like ellipse drawing work here too. Surprisingly,

area filling is very, very slow. Finally, just in case you make a mistake, there is the undo feature.

There are features of Icon Paint which could be improved. For instance, three icons determine operations for copying and swapping the icon images currently being worked on. Clicking the

wrong one can result in one of the icons being completely destroyed with UNDO being the only chance of rescue. It is all too easy to mis-click and destroy the image beyond recovery.

In the end, do you really want a Technicoloured desktop? If the answer is yes then Icon Paint very definitely has the answer and performs the job very well indeed – at the expense of a lot of disk space and some speed, although this is a feature of the Amiga. The main advantage of Icon Paint is the ability to put your creations easily onto your own disks, thus adding the professional touch to your work. The whole package is simple to use and offers very good value for money. So much so, I expect to be seeing a lot more 16-colour desktops in future. Highly recommended.

Plus points: Good value, can load IFF brushes, possible to create and edit very large icons, easy to use.

Minus points: 16-colour Workbench and large icons devour memory, slows floppy disk access, no “grid lock” feature.

M. S.

Price: £17.95

Contact: Hi-Tension Computer Services, Alexander House, Station Road, Aldershot, Hampshire, GU11 1BQ. Tel.0252 344454.

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Most people tend to take computer-generated special effects for granted these days. Spoilt by the sophistication of pulsing, spinning images tumbling into the living room each day, they take such things for granted.

Be prepared to shatter your preconceptions about video animation as Peter Lee takes a new pro. utility for a spin, tumble and flip.

This makes it all the harder for cottage industry video FX designers or home enthusiasts to maintain standards and keep up with the increasing attention-grabbing complexity expected by people.

The Amiga has always been at the cutting edge of video effects for the home user, but it has taken the release of Video Effects 3D from InnoVision Technology to bring it bang up to date. The program's scope is really quite small, but what it does, it does with class, and it has a front-end editing system which is both intuitive and well-designed.

rent disks, and played as if they were one effect.

"The fewer the colours, the faster the animation will be, though even with the maximum of eight colours allowed, I found the results to be even better than I had hoped for."

limitations – sometimes a 75% reduction in speed can be expected. The answer is either to use fewer colours, or add a further 512K of fast RAM.

Video Effects 3D is a manipulation tool and as such cannot create its own images. These will typically be drawn in DPaint or a similar art package and imported.

Text plays a vital role in most video effects, and it is unfortunate that the program does not have any font styles of its own to call on. The manual recommends Zuma's TV*TEXT as a good text generator; after all, in high res the standard Workbench fonts as used by Dpaint are grossly inadequate.

The alternative is to load 3rd party fonts into your art utility; there are a number of public domain fonts available, together with several commercial varieties, the two most common being Zuma's own, and Earthbound. You



Video Effects 3D is one of the latest breed of animation programs which computes movement of an object, draws it on screen then compacts it and saves it to disk as a serial file of hundreds of images to be cycled through. The real beauty here, though, is that screen design is in three dimensions. Each frame of a sequence – and there can be 50 a second – is rendered (drawn) in this way, and played back in realtime bursts. In effect, thanks to some phenomenal crunching of images, you can cram enough screens on one 880K disk for anything from 5 to 20 seconds of animation. When you consider that the image data may well have been compacted from 40 megabytes, this is truly amazing. And you would be surprised just how short an effect needs to be; 10 seconds is a long time in video titling. But if you need longer displays, the good news is that several sequences can be loaded in from diffe-

The program comes on an unprotected disk, accompanied by a stunning demo disk and a large ringbound manual. It works in the full overscan PAL display mode – which creates first class dumps to videotape – but uses only high resolution IFF images – the type you can create in most art packages. The fewer the colours, the faster the animation will be, though even with the maximum of eight colours allowed, I found the results to be even better than I had hoped for.

The program is designed to run on any Amiga system with a minimum of 1.5 megabyte of RAM, though the longer sequences will need at least 2 megs.

A warning here for A500 owners; the use of a 512K A501 memory expansion module will allow the program to run OK, but once high res screens of 8 colours are being used, performance becomes sluggish due to hardware

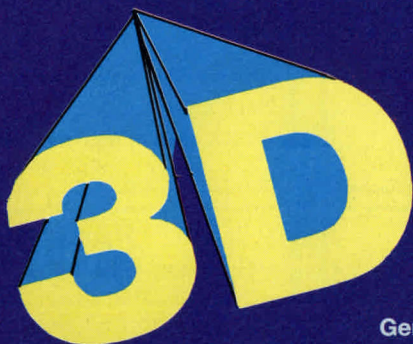
really need a font with a size of at least 30 points to make any impact, and the largest Zuma fonts seem purpose-made for the job, though they are expensive.

The first thing which strikes you on launching into the program from its CLI screen is the superbly designed menu control method. Controls look professional and can all be accessed through the mouse. And while ever a menu is on screen, help information is constantly being displayed regarding every aspect of its features.

Images loaded in can be fully rotated around 3 axis and motion controlled, with zoom, flip, rotate, tumble turn and spin all available to make the finished effect as complex and eccentric as you could want.

The scripts which drive a production are created using a sophisticated control panel within the editor, which displays a miniature of your IFF image

Effects



initially and then gives a wire-frame representation for subsequent manipulation. But at any time you can get a quick precis of how an animation frame will look.

Making the image spin and tumble is only a matter of altering a few values, and movement in 2D or 3D is created simply by specifying a couple of key frames, with the computer working out the in between.

Although smoothest animation consists of 50 frames a second, you can halve the time it takes to draw a sequence by opting for 25 frames per second. There is the opportunity, too, to have a quicker test of your effect by rendering just 8 frames/sec. This is too jerky for serious application, but quite good enough to ensure the playback is exactly as you imagined.

"A whole screen of text which I shattered into four pieces, each spinning independently off screen, took two and a half hours to render at 50 frames/second. But don't begrudge it: the results are well worth it."

And when you consider it could take 3 hours to render at 50 frames, and 30 minutes at 8, you begin to see the advantages.

Generally, depending of course on the range of movement, number of colours and effects generated, you can expect results in a matter of hours. For instance a whole screen of text which I shattered into four pieces, each spinning independently off screen, took two and a half hours to render at 50 frames/second. But don't begrudge it: the results are well worth it.

Scripts can be edited at any time, and are kept on separate disks from your animations — but be prepared to eat through a whole batch of disks as you build up your animation library. An excellent feature is the ability to write a script and then use it repeatedly on different images. So the shatter script could be made to operate on any screen I chose after a simple two-minute editing job. Clearly the rendering process will have to be gone through again for the new image, but the hard grey-matter work has already been done.

Individual frames can be saved as IFF images, and the palette can be amended from within the editor, and in some instances the program itself will modify it to achieve a particular effect: colour 0 is the genlock background colour, while colour 3 is used as the colour for the creation of automatic shadows if you have selected that option.

This is a novel and effective addition to the program's repertoire, allowing your image to cast a realistic shadow on the background as it moves about space. Video Effects makes colour

three 25% darker than the background for this purpose.

Logos (or text for that matter) can be extruded into real 3D shapes, with a 'depth' of 25 pixels. One colour extrusion is the simplest but the smoothest and most effective employs 4 colours and uses solid modelling and hidden surface removal. There is a limit to the size and complexity of this feature, and users are advised to keep their image at around a quarter of the total screen area.

The program also contains several on and off wipe transitions, so that you could have a football rolling along, uncovering a scoreline as it moves from right to left. Again, these effects are easily specified from the editor.

Playing your effects requires exiting the editor program and returning to the CLI, where you must run the display program. This allows a straightforward run — through of your scripts, or series of scripts, or a presentation of the animation with the mouse button acting as a pause toggle. This is most useful for halting the effect while recording onto videotape to make a certain frame linger longer.

But it is a sad omission that you cannot have the player program boot up a particular script; you simply have to go through the procedure of loading in files and then playing them.

The manual contains plenty of examples, but is sadly lacking in either a reference section or index. There is also a RAMtest utility on the disk to ensure your expansion RAM is functioning correctly — apparently some expansion chips can be bad without you knowing it, and the Workbench information about bytes free is only what is anticipated, not what actually is on-board.

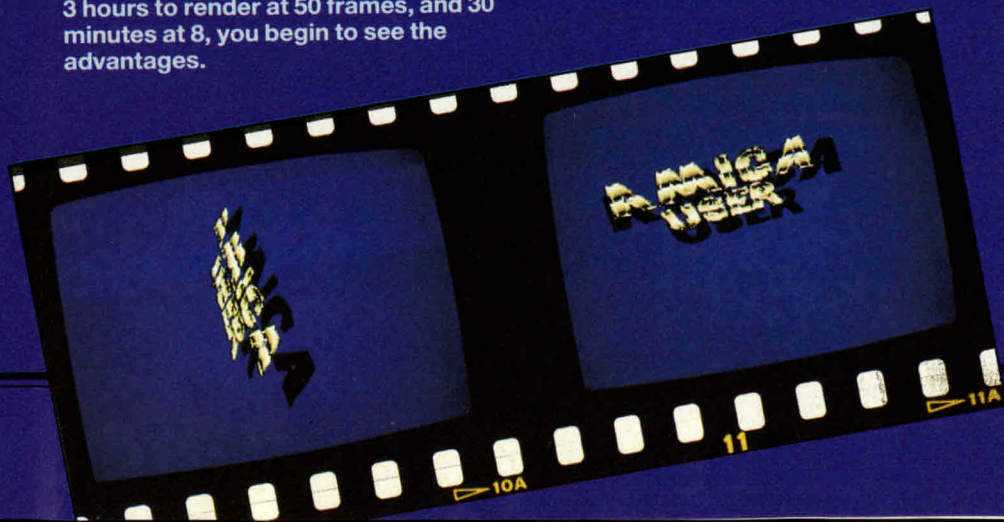
Conclusion

Although aimed directly at the professional market, this is a home animator's dream. The simplicity of a control system which is totally mouse driven hides the gateway to some of the keenest effects you could hope for on an Amiga. The program's scope is not that vast, but its potential is tremendous. Its main use will clearly be in video recordings or TV presentations — there is no facility for using completed sequences in your own programs or for lengthy self-booting demos. Also on the minus side, the process is disk-hungry and slow. Trade these against some of the smoothest, most eye-catching effects this side of a mainframe, and it is all worth it. Unreservedly recommended for the pro. titler.

P.L.

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MIDI Part V

MIDI Data and the Serial Port

Once the Amiga's serial port has been set up to handle MIDI data (and we looked at how to that last month) it is quite a simple matter to actually get the device to receive and send MIDI data. The serial device uses a set of standard requests for all its I/O operations. In effect your program sends requests to the serial device 'asking' it to perform certain operations for you.

The most important of the commands, at least as far as the present discussion goes, are those which enable you to actually read and write MIDI data.

The 'read' request must know where to put the data — so your program has to have an area of memory (i.e. a 'buffer') available for this purpose. The serial request block needs a pointer to this buffer and if, for example, you wanted to allocate a 1K buffer for your program you'd use this type of arrangement.....

```
char buffer[1024]; /* allocate buffer */
SerReq->IOSer.io_Data = &buffer[0];
/* request block pointer */
```

Alternatively you could allocate the necessary space dynamically using a call to the AllocMem() routine.

To read data from the serial port you make a 'request' to the serial device asking that it reads a certain amount of data. It's done using the serial device specific I/O request and this uses the

IOExtSer request block structure that we looked at last month. The amount of data to be collected is specified by setting the IOSer.io_Length field in the request structure. To collect one byte for example you'd set the field like this.....

```
SerReq->IOSer.io_Length=1;
```

To collect 1K (1024 bytes) of data you'd use.....

```
SerReq->IOSer.io_Length=1024;
```

The request block also contains a 'command field'. To read data you must set this field to CMD_READ like this.....

```
SerReq->IOSer.io_Command = CMD_READ;
```

The request block now contains all of the information needed by the serial device. There are several options for getting the serial device to carry out the request but the easiest of these, and the one recommended as a starting point, is synchronous transfer. It's done using the DoIO() function which takes the address of your extended IO block as a parameter like this.....

```
DoIO(SerReq);
```

With this type of request the program will be put to sleep until the request is satisfied or until the serial device detects an error condition. Another reason for the serial device terminating early is that, if it is operating in EOF

mode, it may have recognized one of the 'end of file' conditions specified in the io_TermArray field of the IOExtSer structure. This situation is found when SYSTEX (system exclusive) data is being handled because you would set the term array data to F7 hex, i.e. MIDI EOX (end of system exclusive) in order to detect the end of the SYSTEX message.

If we collect the previous code fragments together we get a typical example of the code needed to perform a synchronous serial device request.....

```
char buffer[1024]; /* allocate buffer */
SerReq->IOSer.io_Data = &buffer[0]; /* request block pointer */
SerReq->IOSer.io_Length=1;
SerReq->IOSer.io_Command = CMD_READ;
error = DoIO(SerReq);
```

DoIO() returns with zero if the call was successful so any non zero value indicates an error condition.

Writing to the serial device follows broadly similar pattern of operations although the command issued would be CMD_WRITE in this case. It's common practice to have separate read and write buffers and sometimes it's necessary to open the serial device twice (i.e. so that you can have totally separate reading and writing facilities available) but the advantages or otherwise of such approaches depend very much on the particular application.

P.A.O.

Susan Maxwell continues the series that makes friends of you and your Amiga.

The Amiga – An Introduction

Part III

AmiigaDOS, like most other operating systems, provides several related areas of support – the disk filing system itself, the support functions which programmers use to interface directly with AmigaDOS, and the CLI terminal handling facilities. It also provides a whole host of commands which allow you to perform all of those common 'house-keeping' operations which, unfortunately, are part and parcel of most computer applications.

The AmigaDOS commands can either be typed at the terminal (using a CLI) or placed in a text file (usually called a 'batch' file or a 'script' file) for execution at a later time. AmigaDOS has its own 'macro' language and this enables batch files to be created that allow a whole series of operations to be performed automatically. A good example of this is the execution of a startup sequence – such as that performed when you boot up from the WorkBench disk. When you 'boot up' your Amiga one of the first things which AmigaDOS does is to look for an 's' directory to see if it contains a file called 'startup-sequence'. If it does the file is executed. Such sequences usually contain quite a selection of individual commands.... some of these assign the important AmigaDOS logical directories to their corresponding physical equivalents on the WorkBench disk, others check for the presence of devices such as the ram-disk and hard disks – installing them if they are found. Various messages will also be printed and of course the WorkBench gets loaded.

You can watch all this happen as you boot up from the WorkBench disk! One of the things you will notice is that just before you see the 'icon based'

display.... the original window which had been displaying the messages suddenly disappears – all that has happened is that the startup sequence closed the original CLI window just before handing over to the WorkBench environment.

In an introductory series of this nature there is not the space to go into specific detail about individual AmigaDOS commands, but we can give you a glimpse of the type of facilities available.... you can copy, join, edit, rename and delete files with commands being made to operate on whole directories, even whole disks. The system date can be displayed or set, text files can be created, edited, printed or 'typed' to the screen and new CLI's can be created or closed. There's an EXECUTE command for performing the operations stored in the batch files and a command to let you add 'filenotes' to a file. You can format disks and collect various disk device statistics (such as free disk space), can view and change logical device assignments and set and change the current directory.

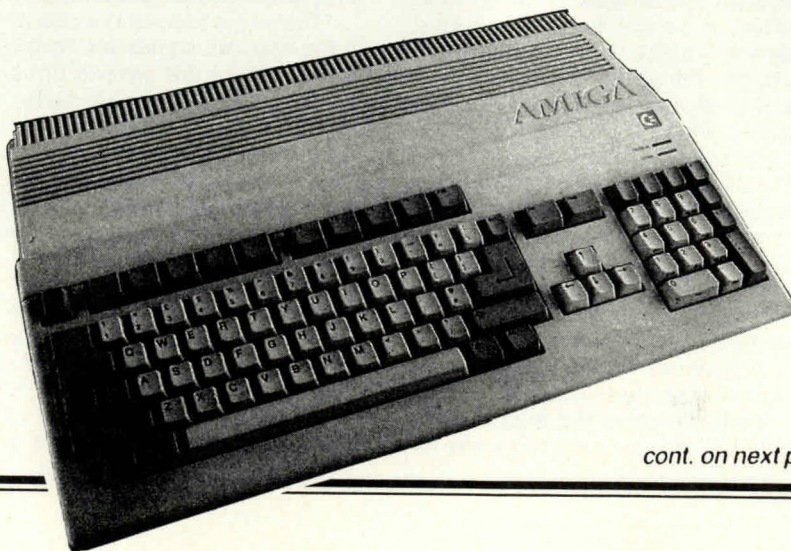
AmigaDOS has quite advanced 'listing' and searching facilities and can perform a whole host of other operations – it even has a 'sort package' although this is not particularly sophisticated. One powerful feature of AmigaDOS is that it allows you to redirect program input and output – this allows you to create files directly at the terminal or send the results of a command to a disk file. There are many other uses of I/O redirection including such things as the transfer of data to another machine via the RS232 serial port.

To give you an appreciation of the facilities offered by AmigaDOS we shall look in detail at just a couple of commands – COPY, which allows you to copy files and directories, and DELETE which lets you remove files or directories.

The syntax of the COPY command is usually given in the manuals in this form.....

`COPY[[FROM] <name>][TO <name>][ALL][QUIET]`

A bit frightening I agree, but it is not quite as bad as it looks as the following examples should show:



cont. on next page

If we wanted to copy the contents of the 'c' directory from a disk in DF0: into the RAM:c directory we'd do it like this.....

COPY DF0:c TO RAM:c

Usually the names of the files will be displayed as they are copied but this can be suppressed by using the QUIET option like this.....

COPY DF0:c TO RAM:c QUIET

The ALL parameter instructs AmigaDOS to also copy files in any sub-directories which may be present. If ALL is used AmigaDOS will automatically create the required sub-directories needed in the destination directory – unless that is they already exist.

It is often a good idea to copy frequently used commands into the ram-disk like this because, for most of the time, the disk drive that you originally booted-up from then becomes free for other uses. To use commands in the RAM:c directory we do not have to change the original command directory assignment – we can simply change AmigaDOS's 'current directory' to RAM:c because the current directory is actually the first place that AmigaDOS searches when it's looking for something.

To create a RAM:c directory, copy the commands from the WorkBench disk (which we shall assume is in drive df0:), and then make RAM:c the 'current directory', takes just three AmigaDOS instructions.....

MAKEDIR RAM:c

COPY DF0:c TO RAM:c

CD RAM:c

You will now find that, when you type commands at the CLI, the disk drive light will only come on if the command in question actually needs to get data from the drive. The drive light will not come on if you type DIR RAM:, but it will if you type DIR DF0: – the commands are still being found in the RAM:c directory but in this latter case DIR itself then looks at DF0: to see which files are present. You will also notice the drive light come on if you mis-type a command (or try and perform a command that is not in the RAM:c directory). What is happening in this case is that because AmigaDOS didn't find the command in the current directory it looks in the assigned 'c' directory as an immediate 'second choice' location.

As might be expected files can be re-named as they are copied. It is easy to do, you just specify a different name for the TO file.....

COPY DF0:c/ED TO RAM:c/NEWNAMES/EDITOR would copy the file ED, which is in the 'c' directory of DF0:, into the NEWNAMES directory of the ram-disk. The name of the new copy would be EDITOR as specified in the command line. It is worth mentioning that if we had not

specified a FROM directory AmigaDOS would have looked in its current directory for the file/s we wanted to copy.

The way we have used COPY so far is nice and straightforward so it shouldn't present any difficulties. You can however do much more because COPY is one of several commands which support the use of 'patterns'. These are strings, i.e. groups of characters, which include some symbols that have special meaning to AmigaDOS as wildcards, placeholders etc. Here are the special characters in question as you see them defined in most AmigaDOS manuals.....

? matches ANY single character

% matches the null string (a string without any characters in it)

#p matches zero or more occurrences of the pattern 'p'

p1.p2 matches a sequence of pattern p1 followed by pattern p2

p1|p2 matches if EITHER pattern p1 OR pattern p2 match

() groups patterns together

' removes the special effect of the above group of characters

To start with you are unlikely to use all of these but it's worth seeing how pattern based commands can be used because they are very powerful. Here's a few examples which should give you some idea of their usefulness.....

##.BAK refers to any file which ends with .BAK

##.BA? refers to any file which has an extension .BA followed by other letter. Note that a file TEST.BA would NOT satisfy this reference because it does not have a third character after the decimal point.

##.BA#? this reference is a bit different – it refers to any file which has an extension .BA followed by zero or more occurrences of ANY group of characters – so in this case a file TEST.BA would satisfy the reference as would TEST.BAK, SECONDDTEST.BACKUP etc.

The best idea is to experiment, i.e. play around with the COPY command until you feel happy with it. If you create the ram-disk directory structure that we mentioned last month (i.e. by using MAKEDIR to create a 'c' directory, a NEWNAMES directory and an OLDNAMES directory), then copy your WorkBench disk's commands into ram as we have just explained you can try these examples.....

COPY RAM:c/E? TO RAM: – this will copy the files which represent all two character commands starting with the letter E into the ram-disk's root directory. You will only find one such file, the text editor ED.

COPY RAM:c/E#? TO RAM: – this instruction will copy every command which starts with the letter E into the

root directory of the ram-disk. The ones you are likely to see copied are ENDIF, EXECUTE, ECHO, ENDCLI, ED and ELSE.

COPY RAM:?N#? to RAM:c/NEWNAMES – this is copying from the ram-disk's root directory and all files whose second letter is 'N' will be copied into the NEWNAMES directory. This will include ENDIF, ENDCLI, INFO and INSTALL.

If you are a newcomer to computing all this might seem a bit too much like hard work. Do not be disheartened if some things seems horribly complicated at first, we all had just the same problems to start with. For these examples, providing your WorkBench disk (and you should be using a back-up copy of this anyway) is 'write protected', you cannot do any harm. Anything done with the ram-disk will disappear the minute you turn the machine off!

One problem you are likely to come across on an unexpanded machine, i.e. an Amiga with just the basic 512K of memory, is that you are liable to run out of memory as you experiment and duplicate files. If this happens you can delete some of the ram-disk files by using the DELETE command. The format of the DELETE command is like this....

DELETE name: [name:] [ALL] [Q | QUIET]

ALL and QUIET have the same use as before but notice that you can use Q as an abbreviation in this case. Patterns are supported as the following two examples show....

DELETE RAM:#? will clear the ram-disk's root directory for you, but it will not delete the ram:c directory because it's not empty.

DELETE RAM:#? ALL would be expected to delete every file and empty directory in the ram-disk. It does!

Many other AmigaDOS commands have similar types of options. Even DIR, which we mentioned last month, is capable of much more than we showed – you can in fact find those hidden (nested) directories by using OPT A after the device name (e.g. if you had typed DIR RAM: OPT A last month you would have seen them) and you can also use it in a special 'interactive mode' although such discussions must be left for another time.

Don't forget that AmigaDOS is multi-tasking! So, with two CLI windows open you can happily be printing a file using one CLI whilst you are performing other tasks at the other.

Next month we shall look at a few bits and pieces that you don't find in most manuals and books. We will tell you about Gurus and why they occur, and explain some things which may be of interest if you are intending to use your Amiga for business use.

S.M.

DOCUMENTATION AND DESIGN STRATEGY

Susan Maxwell

Programmers in general are more noted for their "Let's go do some coding" attitudes than for any excessive desire to document their programs. Unfortunately failure to keep adequate notes has a high price... lessons which should be learnt are not, valuable time is lost. On a bad day you may even lose track of what you are supposed to be doing.

Because the Amiga is a complex machine, a proper attitude towards keeping development notes becomes even more important. The golden rule is simple... document **WHILST** you are developing te program and not afterwards. By all means tidy up the notes after the program is complete but don't wait this long before you make notes at all.

It helps to develop a pseudo-standard layout for all your projects. You need notes that, in conjunction with any design diagrams, will show what the objectives of writing the program were, and explain the reasons behind your

documentation on diskette. Keeping notes in this fashion makes it easy to keep up to date.

Keep notes about the problems you encounter during the development. Note any assumptions you make that might affect program operation if they were changed in the future. Note also which parts of the code are Amiga specific... if you can contain these parts to specific modules then so much the better but I will be the first to admit it is easier said than done unless your program is using very straightforward CLI based I/O etc.

If the routines are small then include the documentation with the source code. If the programs are larger, then use your text editor to create separate documentation. Keep some details within the source code itself telling you where any additional documentation may be found, when the program was written etc. A simple scheme is usually all that is required and a typical source code "header" is shown in figure 1 below.

tialised etc. Most will use various system calls which may need your own routines to pass data to the operating system in a particular way etc. Figure 2 shows a typical assembly or C language source code layout.

Figure 2: Typical source code layout.

```

PROGRAM
HEADER
INITIALIZATION
BLOCK
MAIN
PROGRAM
PROGRAM
SPECIFIC
SUBROUTINES
GENERALIZED
SUBROUTINES
SYSTEM
BASED
SUBROUTINES
    
```

Figure 1 A typical program "header"

```

Program Name .....SPELL - CHECK
Project Reference .....88/ALL/1-1 Copyright (C) 1989 by Susan Maxwell
Purpose.....First phase of an Amiga spelling check program using
memory based tree sort techniques. Will operate all
common ASCII files.
Date.....Project start 23rd January 1989
This source 12th February 1989
Processor.....68000
Operating System .....AmigaDOS
Documentation notes .....Kept separate to source, see project ref. file.
Diskette forms.....Program and documentation are both available:
Source code SPELL.ASM
Object code SPELL.COM
Documentation SPELL.DOC
    
```

approach. You need sufficient program details to enable you at least to understand the operation of the program, and if the program is to be used by non-technical people it also helps to have some "jargon free" user instructions.

The task of producing this documentation is not quite as bad as it might seem. Even if you don't have a word processor you can use ED etc., to keep most of the

In the same way that a standardized documentation layout helps to provide consistency, so does a standardized program layout. But all your programs are different? ... well yes, to a certain extent this is true, but there are many things about the overall structure that will often be similar. All will have some sort of "initial block", where EQUates or definitions are set up, structures and static storage ini-

Many routines find use over and over again. The advantages of building up a "subroutine library" is two-fold. Firstly it is not necessary to re-write the routines, they can usually be loaded directly into the source code you are writing. Secondly you will feel more comfortable using such routines because you know they have been tried and tested. It goes without saying that you should not include routines in your "library" until you are happy that they actually do the job that they are supposed to. In practice the availability of such pre-written routines will greatly increase the speed at which your programs become operational. The Amiga has lots of system routines that you can use, your compiler or assembler will likewise often much help and don't forget the Public Domain stuff: it is written by enthusiasts for enthusiasts, it is free - and some of it is very good.

Documentation and using other peoples routines will not unfortunately, stop things from going wrong occasionally. The golden rule... "don't panic", and do not start making undocumented changes to your source code either. Errors come in various shapes and sizes and it is useful to mention some of the

continued on page 29

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Commodore computer show

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Special Events

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So for a great day out, whether you want to see what the future holds for Commodore computers, to buy the latest software or to get advice on specific applications, the Commodore show is the place to go. And if you send in the coupon today, we'll knock £1 off the price of each ticket!

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If you want a beat 'em up done well, give the job to System 3. Their excellence in the field, has earned them a rock solid reputation with remarkably few releases, indeed Mark Cole's team make the reliable claim that every release that they have made since 1985 has hit the Chart Number One spot. IK+, the sequel to International Karate, is destined to strengthen their name further still.

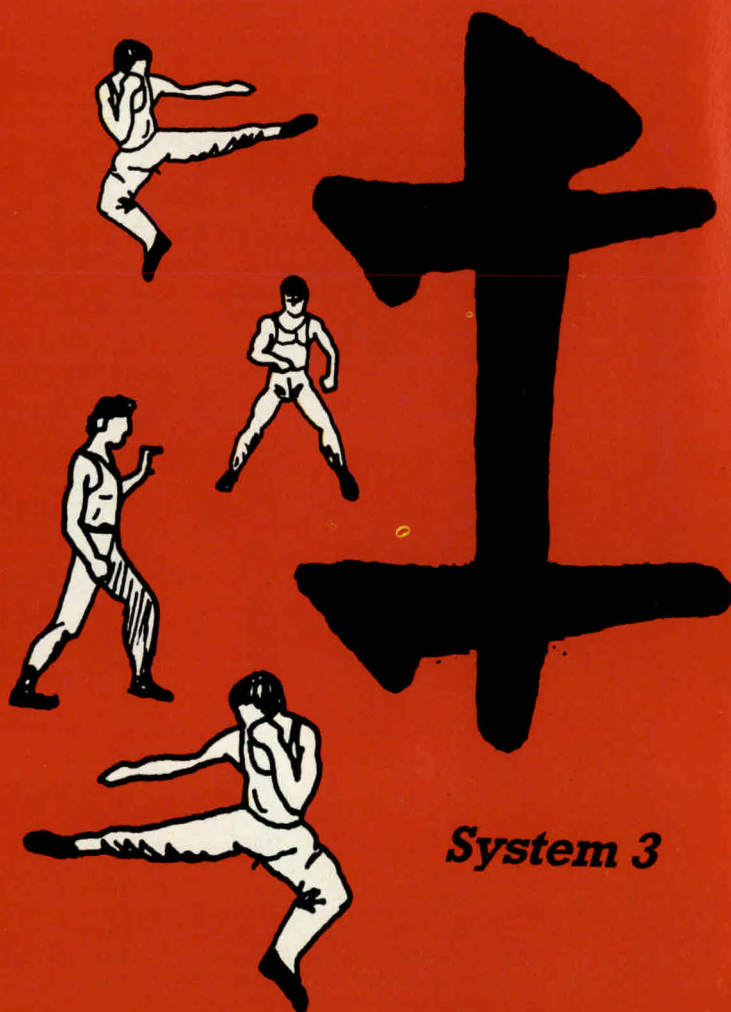
Commodore veterans will no doubt be familiar with the name Archer Maclean. From his superb Defender variant Dropzone, he progressed to International Karate, a souped-up clone of Exploding Fist. Now he has moved into 16-bits, bringing the sequel with him, which for a change has grown with the times.

This time there are three fighters. One or two of these can be player controlled, the remainder coming under computer direction. Twelve attacking moves and a handful of defensive procedures are at your disposal. Some of these have come over intact from the first game: the face punch, shin kick and stomach kick for example, but some vicious new attacks have been added. Now you can head butt,

"Now you can head butt, perform a nifty reverse face kick, or go for broke and attempt to deck both fighters with the double head kick!"

perform a nifty reverse face kick, or go for broke and attempt to deck both fighters with the double head kick! The somersaults are no longer there, but instead you can use the brilliantly animated back flip.

Landing a blow on an opponent puts him out cold



System 3

for a few seconds and boosts your combat points. A time limit of thirty seconds is put on each bout, but usually one of the three brings it to an end before then by scoring six points. After each round the player with the least combat points goes out and the other two go through to the next bout.

Two bonus screens pop up regularly. One arms you with a small shield and throws bouncing balls and spinning heads at you. Deflect them all for a survival bonus. The other places sparking bombs at random on the ground which have to be dodged or kicked off the screen. They are both good fun, but a





bypass option would have been appreciated for when you just want a good punching session.

Rob Hubbard supplied the original IK music, and a great piece it was too. This has been remixed with crystal clear stereo samples and rates as one of the best game soundtracks around. In line with the rest of the game, the sound effects are like an OTT Bruce Lee film. Cracks, squarks, whimpers and battle-cries accompany every blow adding a savage realism to the whole thing.

ism to the whole thing.

IK+ is extremely detailed. The oriental sunset ripples in the distance while all kinds of creatures

"Cracks, squarks, whimpers and battle-cries accompany every blow adding a savage realism to the whole thing"



crawl around the rest of the screen. Even more impressive is the psychedelic title screen; in the centre the IK+ logo backs the credits, while around it an army of tiny men leap about in glorious technicolour. The instructions list a few combinations of keys to press for special features, and there are even more to be found if you experiment.

IK+ is everything a nose-breaking beat 'em up should be. It is vicious, spectacular, loud and great looking. Make no mistake, this is the karate game, and no Amiga owner should be without it.

T.H.

Graphics: 8
Sound: 9
Playability: 9
Value: 9
Price: £19.95

20,000 LEAGUES UNDER THE SEA

The trouble with adventures that are translated into English from another language is that, unless the job is done expertly by somebody who really understands both tongues, there is a very real risk of losing some of the sense and much of the atmosphere in the conversion. That is one of the things that appears to have gone wrong with this French import. Either that or everybody in France now talks in a very stilted and peculiar way.

This graphics adventure (with some added text, mainly dialogue) is loosely based on the famous novel by Jules Verne. The good ship Abraham Lincoln, containing Monsieur Farragut and Professor Arronax (they sound a bit like laxatives, don't they), sets sail in search of a reported sea monster. What they find – or rather, what finds them – is Captain Nemo and his famous submarine, the Nautilus.

The large-screen graphics are quite good – lots of Victorian innards and a neat use of browns and golds – and in keeping with the atmosphere of the original story. The basic idea is to explore the submarine, keep on the right side of the sullen Captain Nemo, learn what you can and can't do by experimentation, and plot your escape. Unfortunately sudden death or game termination seems to be the order of the day.

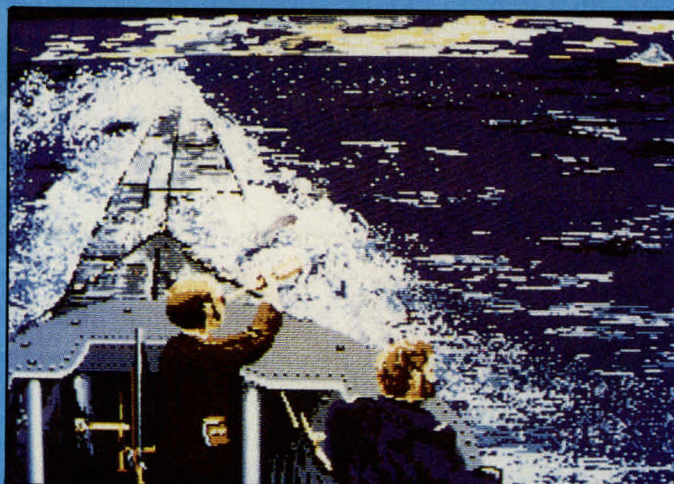
“Clicking on an upward winding stairway that leads to the top exterior of the sub causes instant death if the Nautilus happens to be below the surface at the time.”

Playing the game consists mainly of clicking on people or objects on the screen. Clicking on people usually brings up a snatch of dialogue, much of which reads somewhat oddly no doubt due to the translation. In the main room (the lounge) of the Nautilus, you can look out of the huge, underwater window and examine a map (used to plot a course), a compass, your log book, a couple of instruments and a diving helmet. Clicking on an upward winding stairway that leads to the top exterior of the sub causes instant death if the Nautilus happens to be below the surface at the time.

From the main room, you can also visit the engine room or the captain's quarters. Instruments (including a periscope) adorn the engine room but messing about with a couple of levers generally results in your upsetting the ever-testy captain and spending a spell locked up in your cabin.

In the captain's quarters, you can play a few notes on the organ (complete with sound effects) or browse through his many books. Again, chances are that Nemo will soon lose his cool and ask you to leave – or forcibly eject you if you don't push off voluntarily.

You may get a chance to stretch your legs



ashore or go strolling underwater in a deep-sea diver's outfit. The graphics in the island walkabout sequences, although animated, are rather poor with control of your mobile, joystick-steered character being erratic to say the least.

The game concept is an interesting one but the execution leaves a lot of room for improvement. It is all too easy to bring the game to an unsuccessful end and frustration can quickly set in. Although it has its good points, 20,000 Thousand Leagues Under The Sea is, overall, a disappointing game.

Personal rating 4

Graphics: 7
Sound: 5
Playability: 6
Value: 6
Price: £19.95

B.C.

continued from page 24

most commonly occurring ones.

Syntax errors should be by far the most common. You may mis-spell the name of a function, or mis-type an instruction mnemonic or label, e.g., CHECKWRD when you meant CHECKWORD. You may write a comment after a statement and forget to include the delimiter character which tells your assembler or compiler to ignore the comment. Doing this is a great way to upset things, because it usually results in the assembler or compiler trying to treat your "comment" as though it was a series of instructions... obviously it does not get very far before it finds things it cannot understand!

Just because your "source code" has been assembled or compiled without errors it does not necessarily mean that the program is correct. It means only that the source code has been understood. Modular approaches help a lot in reducing the 'silly error' rate and there's no doubt that this particular 'error prevention based' approach is the best policy to adopt. Try to plan out and design "small sections of code", i.e., use subroutines and function calls for as many procedures as possible. Small sections of code are easier to write, easier to examine, and more easily changed if the need arises.

The isolation, in terms of distinct functions or subroutines, has two benefits in terms of "debugging". Firstly it is usually

possible to devise ways of checking particular routines one at a time. Secondly it is much easier to alter or replace a small section of code from a single large section. If a program or routine does not run as expected then try to identify the area in the source code that may be causing the problems. Examine the code to ensure that the instructions written are the instructions that you intended.

Try to identify the cause of the problem BEFORE you alter the source code. Above all do not be tempted to guess! If a routine does not work then there is a fault present. You should (with practice) be able to identify that fault from the source code listing, and until then it is advisable not to make "wild guesses", they usually simply lead to further problems.

Logical Faults: These problems are often the most disastrous. There is nothing worse than spending many hours writing routines that, once combined together, are riddled with seemingly inexplicable faults. When faults such as this occur there is no simple answer, the debugging of these types of problem often requires large sections of code to be changed (which may introduce further errors!). Quite simply, the best way to avoid the problems that logical faults create is to use techniques that enable the design of the program to be viewed during development.

Most people devise their own approach to documentation but if you want some guidelines to work to we shall leave you this month with a general scheme to get you started...

*** Identify the problem and keep written description of the project you are going to tackle.**

*** Break the problem down, using every technique that you feel will help, so that smaller more manageable areas can be identified.**

*** Include early on notes on how you expect to code those areas that appear straightforward.**

*** Ask yourself whether more complex areas may be broken down further. The answer is usually "yes". Continue the breakdown until you are happy about the coding of various sections of the project.**

*** Use your flowcharts, design diagrams and your notes as a starting point for a basic "program structure". Make lists of the routines that need to be developed, and note those that may be available from "library" sources.**

*** Work on individual routines in isolation, but keep in mind that they must be compatible with the remainder of the program.**

*** Test routines individually to ensure that they perform as they should. Complex programs can be built up "piece by piece" with any errors usually resulting from the "last routine to be added".**

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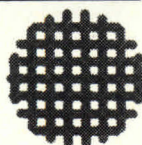
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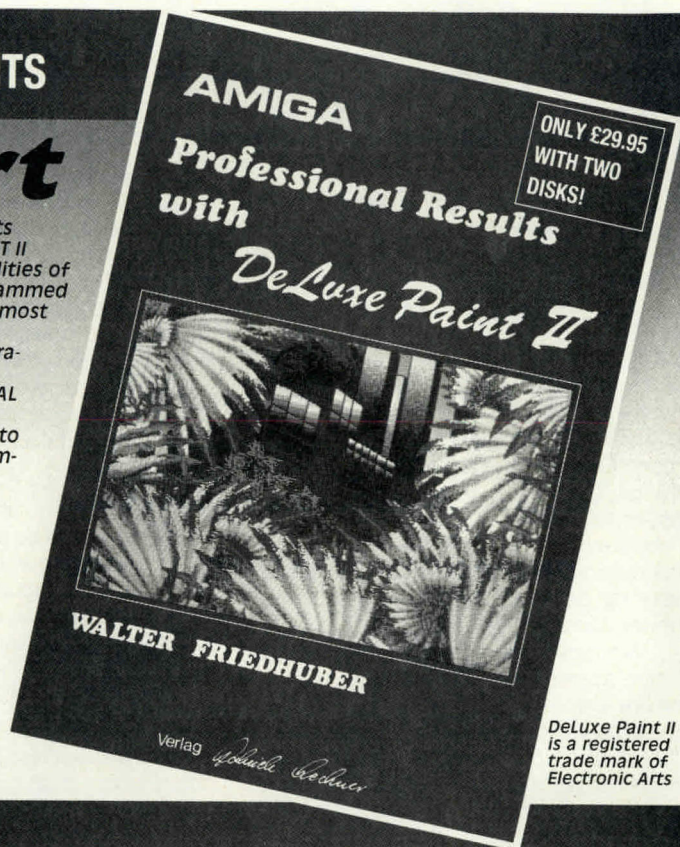
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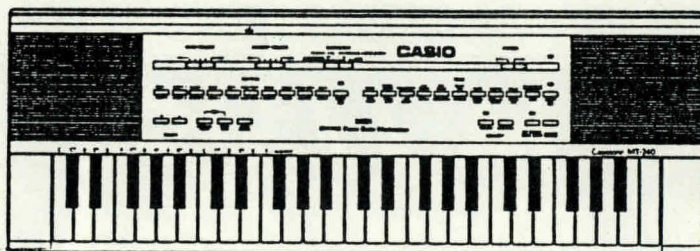
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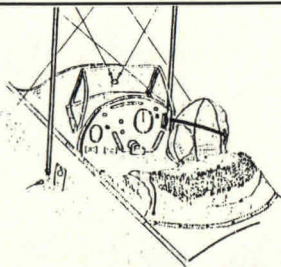
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INFORMATION TECHNOLOGY & HOW TO USE IT

Robert Hinton

Information technology is a resource and, in today's world, one of the most important we have. It is also a growth industry with a rapidly increasing impact on practically everything we do. The term covers not just computers and word processors but any electronic device which can inform and communicate. So telex, teletext and fax machines, data, voice and image processors even telephones can be included under the 'umbrella' name of IT.

This book is not only for the computer enthusiast but, and I quote, 'anyone who feels uncertain, confused, bewildered or threatened by the subject'. And there are many who do.

It does, I think, succeed admirably. It is written in no-nonsense language not hi-tech jargon, and explains in great detail what IT is, what to look for when buying a system, how to install it, what to do when you have it, and how it will affect those who use it. Although primarily written for professional administrators any student of IT will find this book extremely useful.

One of the most important things when a company changes from any sort of manual system to modern IT is how employees react to that change. It's all very well for the members of the board room to agree to the installation but, unless, the rank and file have been kept informed and, yess, even consulted – although this goes against the grain with some managements, more's the pity – many of them will feel threatened by the

changes taking place. Hinton lays particular stress on the importance of reducing anxiety in previous non-users of IT. Insecurity, low morale, even resentment, can and does affect individual performance and this will, eventually, be reflected in the corporate showing. If managers follow the advice given in this book no such happening will occur.

I read recently of a magazing publishing company – no, not this one! – which introduced computerisation in its non-editorial departments. The package cost £50,000 but, even as it was installed, the company bought another title, which added an extra 30,000 subscriptions to its list. They found, unfortunately for them, that their package couldn't cope. It will cost a further £10,000 to enable them to up-grade. The publisher in question now says that they realise they should have gone more deeply into the issue before they bought what was, in effect, a 'pig in poke'. It's a shame they couldn't have read this book before they laid their money on the line.

Hinton gives information and help on IT itself and they way it's used; devising, preparing, and developing a strategy before its use and the many personnel and management issues that may arise once you have it. Also included is the subject of frauds and how to avoid them. And, if you already have an IT system and are looking to up-grade or change it, then he will help you there, too, for tendering and selection procedures are detailed. There is even a sample questionnaire that could be issued to prospective suppliers.

Not sure of what hardware and/or software to choose? There are chapters

on these as well as the essential security aspects necessary. For those with previous knowledge of any IT system some of what Hinton states may seem superfluous, e.g. the importance of making back-up copies of all data disks, but his book is for the novice as well as the experienced so some basic facts are necessary. (So, if you are not sure of the difference between a 'bit' and a 'byte', don't know what ASCII stands for and think RAM means a four-legged, horned, smelly animal, Hinton will put you wise).

What I liked most about Robert Hinton's book is that he puts people before machines of any kind. Enlightened management, will, of course, already be aware of this but he emphasises how important it is for personnel at all levels to be involved in the changes that are being made.

There are still some companies which install it without any prior warning to staff and others who think a couple of hours in front of a VDU will be sufficient to enable everyone to become experts. As Hinton so correctly states, 'for most people evolution is preferable to revolution, especially in matters which affect their personal sense of well-being'. At £30.00 this book is not cheap but it will be cost-effective, for it will ensure that both the employer and employees sense of well-being in relation to IT is maintained. Not to mention the savings that will be effected if it is read before any kind of installation is contemplated.

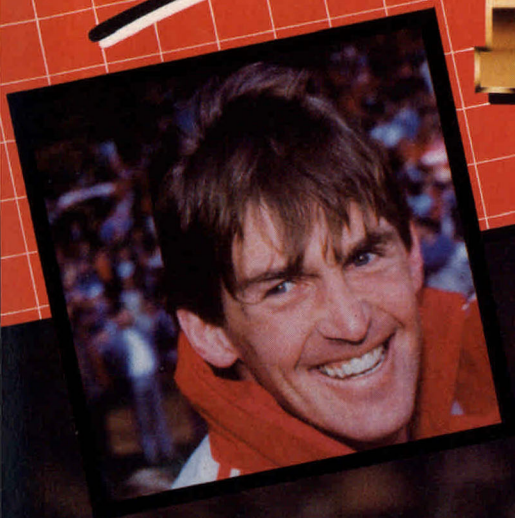
D.M.

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Electric Dreams

*'The best computer race game of all time?'
Is Tony (Call me 'Iceberg' Baby)
Horgan losing his cool?*



It didn't have the impact of *Outrun* or *Afterburner* when it hit the arcades, but Sega's *Super Hang On* makes a perfect source for an Amiga coin-op conversion. While the other two seemed to impose great strains on the programmers and the Amiga's hardware, Electric Dreams' conversion copes with the task with apparent ease.

Four continents await you and your nitro-injected mean machine. Like *Outrun*, it's a race against time from one stage to the next. Unlike *Outrun* there are no forks. Instead you choose your route from a stylised map of the world, where four continents offer races of varying length and difficulty. Before you get onto the track you can make a few handy alterations. First, you can use either mouse or the joystick and customise the sensitivity to suit your style. Next you take your pick from four soundtracks, then choose your route and finally get into the race.

HANG

Passing the drone racers is tricky, but it is more a matter of technique than raw speed. Where sheer speed does come into it is when you glance at the clock to find you have just five seconds to round the bend and hit the straight at the end of the stage. This calls for a sharp nitrous oxide injection to power you from 280kph to 324kph. It really does the business, not only recovering vital seconds but giving an amazing feeling of speed.

As you pass each checkpoint, the scenery changes and any seconds left over from the last stage are added to your new time limit. Every stage has a set layout that you must learn if you are to win. Between the billboards, direction signs indicate a left or right hand bend ahead, but even these are wrng sometimes! As well as the nitro, you need to learn to make good use of the brakes and come off the throttle at times. Haring around every bend is a sure recipe for a spectacular crash, though once you get the hang of a track you can keep the nitro engaged for almost the whole stage. A progress map at the top of the screen gives you an indication of how far you have to go, along with all the score and time counters.

Where Super Hang On leaves its rivals is in its graphics. The main sprite is virtually a pixel for pixel copy of the arcade original and the scenery is equally well drawn, and complementing these is the superb road. For once the perspective is just right, the hills and bends look realistic and it is all very



silky. In fact, everything moves extremely smoothly and at a hell of a rate.

Annoying moans are usually put in place of engine sound effects, but this is not the case with Super Hang On, and when that nitro kicks in you can almost feel the power! It is good to see all four soundtracks have been included, even if they do lack a certain oomph.

I've got a soft spot for 3D race games, but even if you have not I am sure you will not be able to resist the totally addictive thrill of speeding around four continents on a silver beast at 324kph! Forget the rest, Super Hang On is brilliant, and gets my vote for the best computer race game of all time.

T.H.

"The main sprite is virtually a pixel for pixel copy of the arcade original and the scenery is equally well drawn, and complementing these is the superb road"

Graphics: 9
Sound: 8
Playability: 10
Value: 10
Price: £19.95





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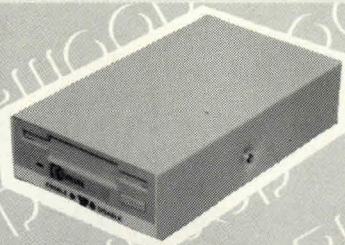
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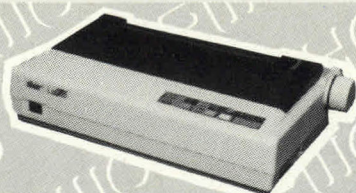
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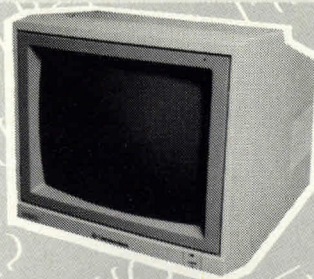
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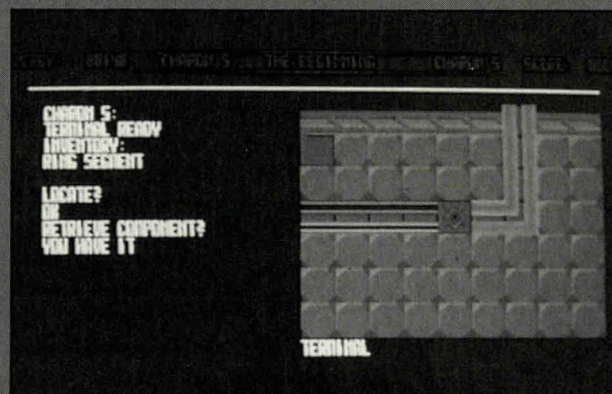
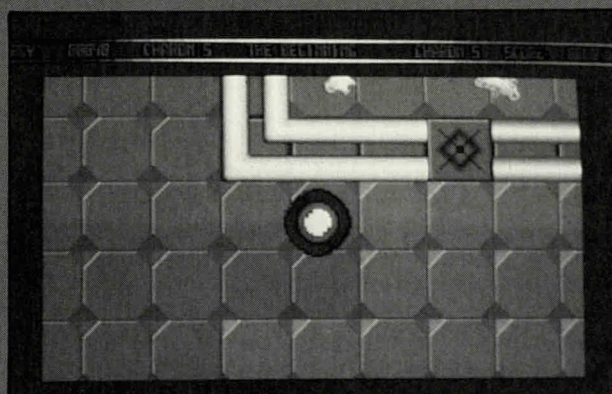
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CHARON 5

Mindware International

Mindware is not a name most Amiga users would associate with games, but this Canadian software house intends to change that with the release of Charon 5, a blend of arcade zapping and strategical brainwork.

marked with a diamond, and each holds a component corresponding to a particular break in the circuit. Log onto one and it gives you the component along with a diagram of its whereabouts. Now you have to locate the break and insert the missing



According to the plot, 124 years into the future, the local space boffins have spotted a strange spacecraft drifting towards your neck of the solar system. On further investigation they find it deserted, but also come across a wealth of high-tech gadgets that could be put to good use on your own planet. A team is sent in to strip the cruiser of its valuables, but in the process a previously undiscovered alien lifeform is awakened and taking a dislike to the scavengers, the aliens herd them into the lower deck of the craft and dismantle the life-support system. Your orders are to repair the system and save the prisoners.

Despite all this talk of a spacecraft laden with technological miracles, the scene is actually very bare. Each chamber has a floor of energy-rich tiles, very occasionally broken up with small barriers. To get the life-support system up and running again, the broken circuit that snakes around the ship must be fixed. You begin in the centre of a cross formation of computer terminals. These are symbolised by tiles

piece.

Once you find it there is a brief sub-game in which you chase a pulse along a scrolling grid in order to rejoin the circuit. You can hardly fail to succeed but it does vary the gameplay a little.

All the time little aliens buzz around you and really are a very weak attempt at a bit of arcade action. Taking pot shots and annoying sparks that constantly irritate is far from my idea of a good blast.

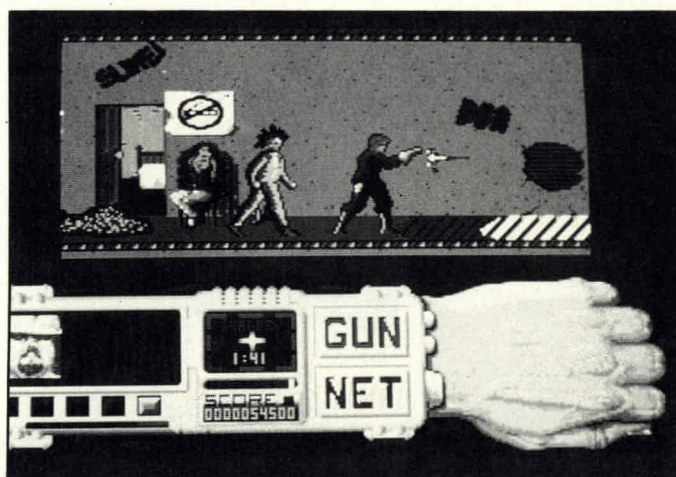
Charon 5 is like an eerily empty version of Andrew Braybrook's old 64 hit Paradroid. Guiding your extremely unimaginative ship around a bland cruiser, replacing a missing link every now and then is tedious from the word go. With no in-game music and only a handful of effects there is virtually no atmosphere either. The only feature of any note is a clever graphic effect on the loading screen. Billed as a new design concept, Charon 5 is in fact a watered-down combination of dated gamestyles, and consequently has very little to offer either the strategist or the zapper.

T.H.

Graphics: 4
Sound: 3
Playability: 3
Value: 3
Price: £19.95

If there's any truth in the novels, comics and films dealing with the future of the World's policing, today's crime rate is set to take a sharp turn for the worst. Techno Cop takes you to one such future world, where street crime has got way out of hand. It's your patch, and as the best Techno Cop around you set your sights on cleaning up the district, not with good old fashioned "community policing", rather with your paralysing snare-net launcher and a magnum pistol.

Before you get to use these lethal weapons you have to make your way to the scene of the crime. Your transport bears a striking resemblance to a Lamborghini Countach, (Now there's an incentive that would send recruitment soaring!) but is in fact a VMAX Twin Turbo Interceptor. The roads are infested with all the usual Mad Max characters, most of whom are just a nuisance to be shot of barged off the road. All the action is squeezed into the top half of the screen where everything is viewed from very low down, giving a slightly cramped feeling. Although the 3D graphics just about work well enough, this section slips up in throwing you out in the wrong direction as you corner, so instead of steering into the bends you have to do the complete opposite! An on-board computer gives you a readout

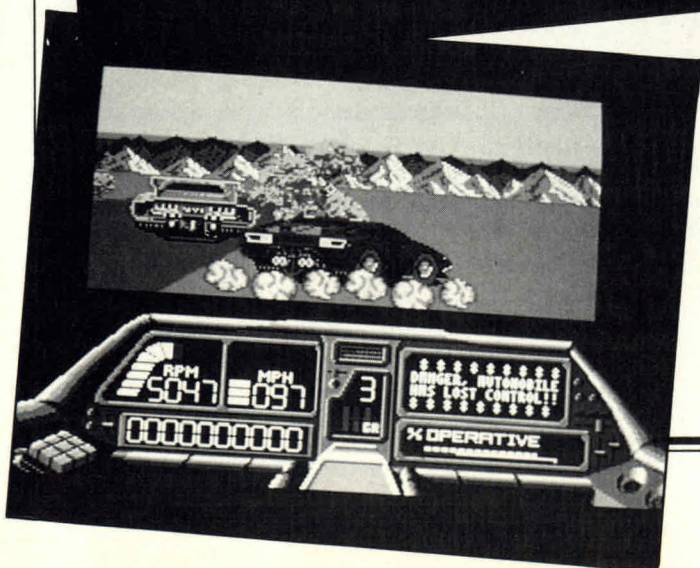
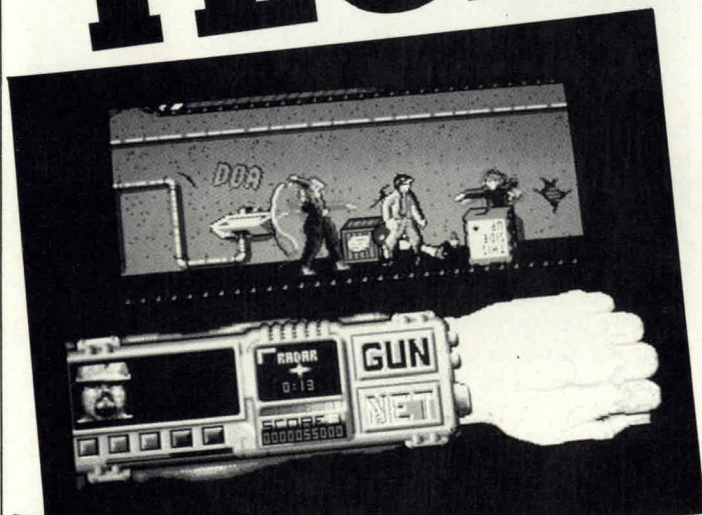


of the distance to your destination, and as you reach it you are given a brief of your target and a digitised mug-shot.

Now the game turns into a Rolling Thunder variant. With the help of your pocket radar, your current concern is to track down the villain. The maze of corridors is connected by a system of lifts

Gremlin

TECHNO COP



which initially lead you straight to your enemy, but later are used as confusing red herrings. Various other punks and junkies attack you with knives and axes. This is where your magnum makes an appearance. A few short blasts from this reduces the baddies to a floundering pile of flesh. Alternatively you could trap them in a Spiderman-style net, or if you're feeling really forgiving you could just somersault over them. The sprites are well drawn and animated, but the extremely gorey death sequences could be seen as just too vivid for some. Again, only the top half of the screen is used for the game, but even so the programmers have had trouble in scrolling the backgrounds smoothly.

First impressions are not at all favourable due to the very familiar Roadblasters/Rolling Thunder format. It does improve as you play, and despite all its faults both sections have their moments. I can see the Deathwish III style of mass murder in the name of the law seeming unnecessary to some, so think twice about choosing this for Tiny Tim's birthday present. However, for the bloodthirsty aching for vivacious revenge on the muggers and others indulging themselves in anti-street sports, Technocop could just make your day.

T.H.

Graphics: 6
Sound: 5
Playability: 6
Value: 5
Price: £19.95

ZANY GOLF

Electronic Arts

If you thought a game of crazy golf on a blustery British seafront was wacky, see just how crazy the game can be and get a load of EA's Zany Golf.

It gets off to a good start, allowing up to four people to take part, a feature bound to boost any sporting game's appeal. Nine holes are included on the disk, each loaded one after the other.

The windmill hole is first up. In classic crazy golf style, the idea is to putt the ball into a slot which leads down through the doorway of a lighthouse on the level below. Alternatively you could attempt to get the ball through the door of the windmill and earn yourself an extra stroke. Using the angled walls and fences you now have to get the ball down the hole before your allotted number of shots runs out.

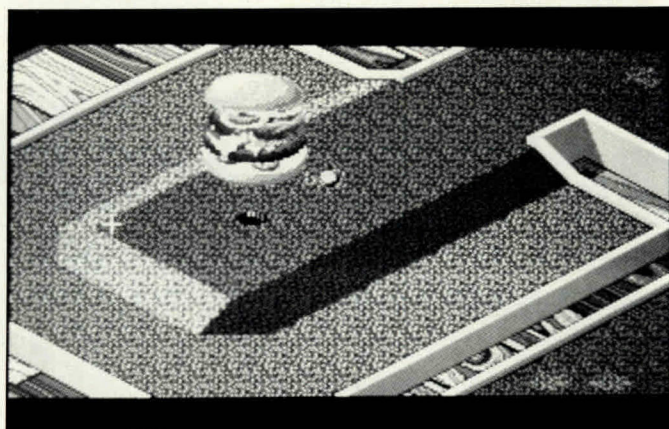
Loading between the holes can get a bit tiresome, but there is a little light relief in the way of small but excellently detailed graphics introducing the theme of each as it loads.

Things start to get silly at the hamburger hole. Here you find a burger sitting over the hole, which can only be moved by quickly clicking the mouse

"Once you get a good speed up, whack the ball at the jelly-like spill of ketchup and hope it ends up somewhere near the hole."

button to make it bounce up and down. Once you get a good speed up, whack the ball at the jelly-like spill of ketchup and hope it ends up somewhere near the hole.

No-one could say Zany Golf's holes are unimaginative. There is a pinball table with working flippers and mushrooms, and other holes with controllable fans and bumpers for squeezing the most out of each shot. The final one is played in a scene that looks like



Dr. Frankenstein's lab. By activating buttons on a control panel and teleporting to higher ledges you might just finish it.

The isometric 3D is a good idea and works well in general, though the collision detection is annoyingly inaccurate in some of the more complex situations. The program also has a bit of trouble in scrolling the screen smoothly, slightly detracting from the bright cartoon graphics. You would not expect sound to feature prominently but there are some jolly pipe organ soundtracks included to get you in the mood. The graphics are brilliant, sharp and beautifully executed.

Zany Golf is fun, but the nine holes aren't enough to give it real staying power. Still, it is a good laugh with a bunch of friends, and if you are not too bothered about the small number of screens it will make a highly enjoyable and much less serious alternative to Leaderboard. Recommended.

T.H.

Graphics: 7
Sound: 6
Playability: 7
Value: 6
Price: £24.95

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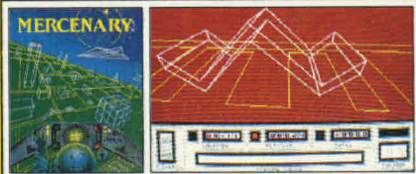
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SPACE HARRIER

Elite



Is there any home computer or console that has not yet had the pleasure of running a version of Sega's Space Harrier? Umpteen versions have been spawned from the original coin-op across just about every possible format, and now at last Amiga owners get a chance to stride into the Fantasy Zone.

"Under one arm you carry a small but extremely powerful rocket which doubles up as a rapid-fire laser gun"

Dragon Land has been overrun by a band of evil supernatural creatures, bringing chaos to the once peaceful country. With numerous successful space-war missions under your belt, you take it upon yourself to send these monsters back to hell. Under

one arm you carry a small but extremely powerful rocket which doubles as a rapid-fire laser gun. Unfortunately the speed controller on the rocket seems to be jammed at the top end, so it's full speed all the way.

As you enter the first stage, a fleet of airborne boulders come speeding over the horizon and into the foreground in a split second. They break up with just one shot but are lethal in a collision, knocking you out of the sky and relieving you of a life in the process. More deadly than these are the robots that provocatively swirl around the screen firing white hot missiles in your direction. At the end of the level, an enormous Chinese dragon rolls into view. Dodging back and forth, it lets off a barrage of fireballs and takes numerous direct hits to the head before exploding.

Subsequent levels introduce heads of rock, magic mushrooms, giant droids and two-headed dragons among others. Apart from the very short

disk access between levels, your first break from the amazingly fast action comes at the end of level five! Here you get a once in a lifetime chance to ride on the back of a fluffy dragon in the bonus stage.

"Apart from the very short disk access between levels, your first break from the amazingly fast action comes at the end of level five!"

Space Harrier has always been a stunning game, and the Amiga version is no different. Not only does it use a full PAL display, but the graphics fill the entire screen! Great! Why don't all games houses follow suit? Furthermore, the 3D graphics are extremely fast and smooth, enhanced by the effect of the changing perspective as you dive and climb.

Some of the speech from the original game has been included, but the "Get ready!" sounds as if it was sampled over the telephone. The other effects are agreeable although the music could do with a bit more punch.

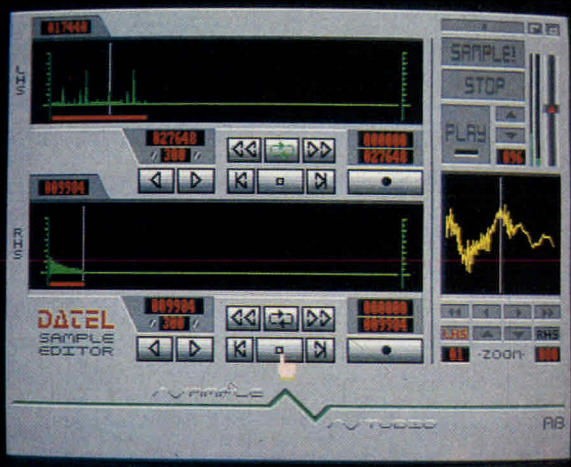
Space Harrier demands few skills from the player, most of the game is just dodging around the screen and holding down the fire button. That isn't to say it is easy; it is hard, but just holds back from going too far, giving you a chance but keeping your palm nice and sweaty. The programmer has been considerate enough to include a mouse control option, allowing very precise movement. Like the arcade machine, it is the exhilarating speed which gives Space Harrier its pull, and for that it deserves much praise. To put it simply, you could hardly have asked for a better conversion! This is the one to get and keep playing!

T.H.



Graphics: 9
Sound: 6
Playability: 8
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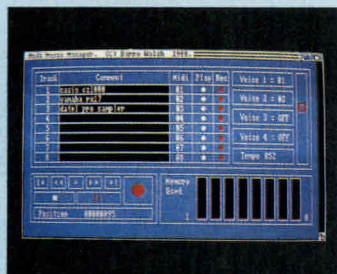
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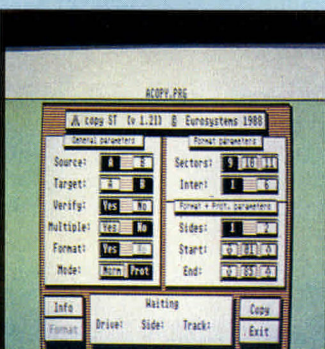
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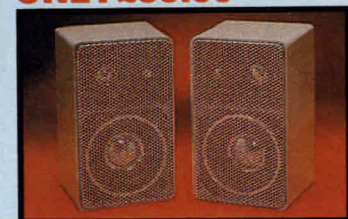
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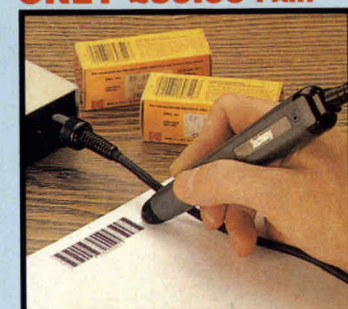
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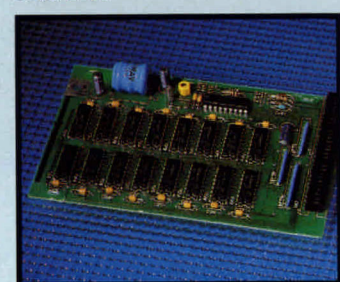


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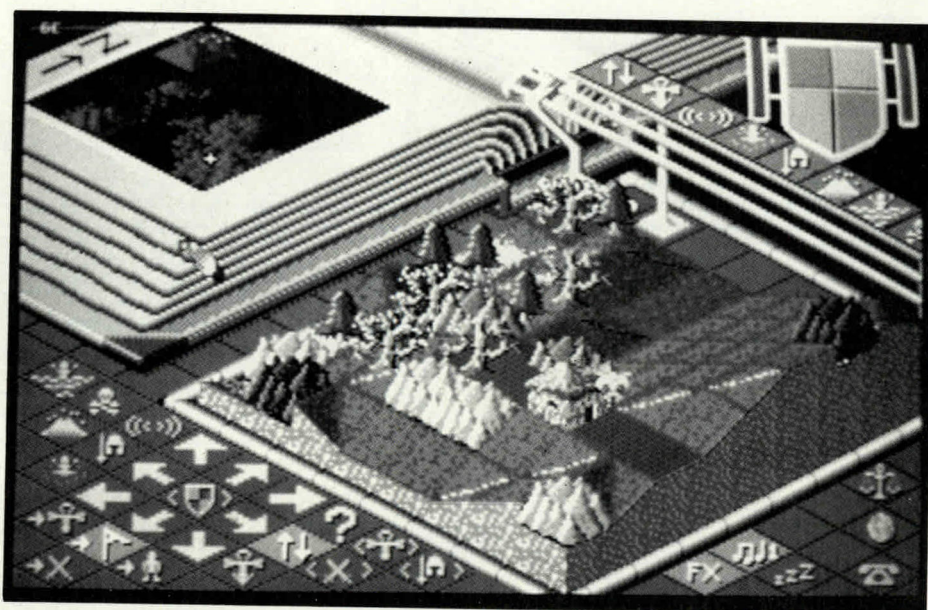
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HEARD IT ON THE GRAPEVINE



You remember I told you last month about how Tiertex, in their conversion of Capcom's Tiger Road, had improved their scrolling routines from Rolling Thunder? Well, if you took a good look at the screenshot you might have seen a Probe Software logo at the bottom of the picture. It just goes to show, even us humble immortals at Amiga User make a mistake once in our lives.

While we are on the subject of Capcom conversions, do you remember what a cock up Tiertex made of Street Fighter? Now they've got a second chance to prove themselves with its pseudo-sequel Human Killing Machine. As before you travel the globe, confronting every Fritz and Helga that has the cheek to stand in your way. The thought of kicking the hell out of a Spanish matador is pleasing, but when the game demands you take on the bull things

take a turn for the worse. Beating up bulls and dogs isn't really my scene. Where will it all end? Stoning live cats and biting the heads off chickens?

Impressions are a new software house due to make a first appearance with a game called Raider. In a similar style to Oids and Thrust, you control a rotating, thrusting ship on a mission to retrieve cogs from the surfaces of eight planets. An old theme but a popular one, available any day now.

3D graphics have featured regularly in computer games from the start, but true 3D is another matter. A new game aims to go one better than the Super Hang Ons of this world with its stereo vectors. Elite's Wanderer uses blue and red clones of each image, off-set at varying distances combined with filters on the 3D specs to give a real 3D effect. The game itself casts you as a mercenary hired by an

continued on page 48



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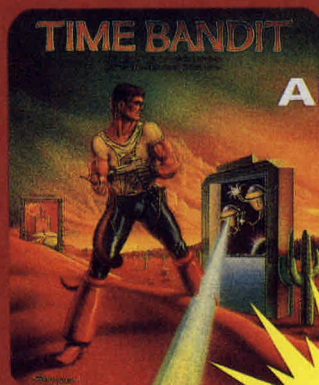
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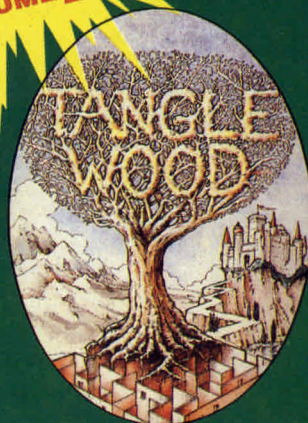
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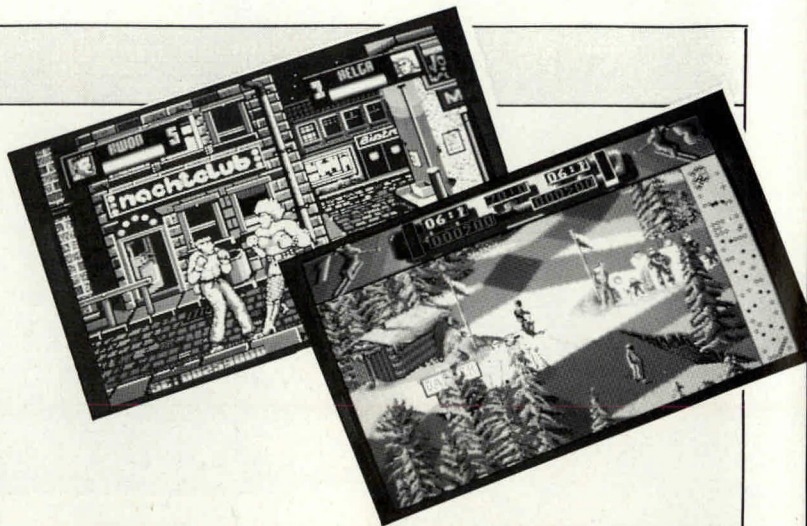
continued from page 46

alliance of ten planets to destroy their overlord.

Enterprising Codemasters have something to offer anyone disappointed by this year's snowless ski season. *Advanced Ski Simulator* gives you two player piste action over seven resorts. Tightly packed slalom gates, abundant conifers and inconveniently placed log cabins test your co-ordination to the full.

Apart from a couple of strip poker games, when it comes to combining sex with computer games no-one has yet managed anything halfway decent (or should it be indecent?). *Emmanuelle* from Coktel Vision takes the extremely awkward style of *20,000 Leagues Under The Sea* and replaces Captain Nemo with a frisky young female in Rio. You, as the equally frisky young male, have to track her down via the ever-willing women of Rio. The game fails on two counts: slow and confusing gameplay, and an almost total lack of raunchiness.

One last snippet before I go, and that's *Populous*. An unusual game that looks a little like a wargame



but plays like nothing I've ever seen. To tell you the truth, it's not my cup of tea, and with its spooky soundtrack it's likely to send me off the sleep (not hard on a Monday morning), but if you want something a bit different, keep 'em peeled for *Populous*. It will be reviewed in our next issue very enthusiastically – but not by me!

T.H.

PREVIEW

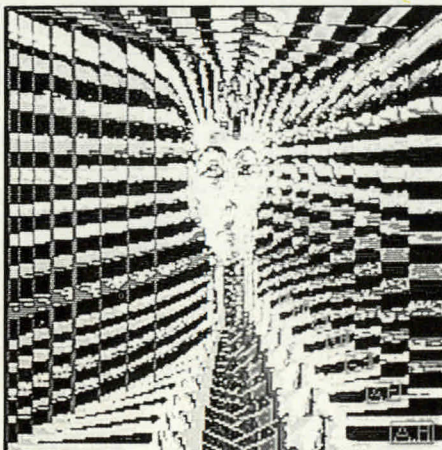


DP III ARRIVES!

Electronic Arts has announced the release of *Deluxe Paint III*, the first in a new class of graphics software that integrates paint and animation. In addition to improving *DeluxePaint II*, their best-selling and most highly regarded paint program on the Amiga, it offers a whole new category of artistic capabilities – the ability to create animation. *Deluxe Paint III* will be available in early April.

"*DeluxePaint III*," E.A. tells us, "is a professional quality graphics tool that actually paints animation." The new program allows users to *AnimPaint* (animation-paint) a series of screens in the same way as they would normally paint a single screen. Users can also create and paint with multi-frame *Animated Brushes*. In this mode, users can create multi-frame animations as a bird in flight. In addition, *DeluxePaint III* integrates animation with its *Perspective*

capability in a feature called *Move*. This quick and easy feature allows the user to define a brush, a distance for it to travel (in any of three dimensions), a rotation (about any of three axis) and



the number of animation frames to draw the movement across.

In addition to adding animation capabilities, *DeluxePaint III* enhances *DeluxePaint II* with extra-halfbrite support, enabling users to paint in 64 colours instead of only 32; wrap mode, in which a brush can be wrapped into any shape; tint mode, which makes it easy to colourize black and white images; direct overscan painting, so users don't have to scroll to create full-video images; an entirely new airbrush, redesigned to meet the professional needs of an artist; access to any number of fonts, styles and sizes in the new all-in-one font requester and much faster operation. *DP III* needs 1 Meg of memory.

DeluxePaint III, £79.99 (249DM / 880FF). Upgrades are available through Electronic Arts Customer Service.

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BLASTEROIDS

Take a look at just about any computer game released in the last five years or so, and the odds are you will find it has close links with one of the few arcade machines that started it all off. Strip away all but the bare bones of Sega's latest race 'em up *Power Drift* for example, and you are left with a very similar concept to the monochrome *Night Driver*. Similar comparisons can be made with most games, but fortunately the original idea has usually come so far that similarities go unnoticed. *Blasteroids* is the sequel to one of those pioneering coin-ops, but this time the original concept is not so well developed.

When coin-ops began, a number of different graphics techniques were experimented with. Mechanically projected images made a brief appearance, but these were overshadowed by the more hi-tech vector graphic and pixel-orientated bitmapped graphics. Black and white vectors were soon outdone by the multi-colour pixels, but before that day, *Asteroids* was the best alternative to *Space Invaders*. Since then it has cropped up in more public domain libraries and budget software than any other game.

Blasteroids sets you the task of clearing numerous screens of asteroids. Your ship uses a combination of rotate and thrust controls for movement, and a forward-firing cannon for blowing away the space debris. The wrap-round screen means that anything that leaves off one edge reappears on the opposite side. All the asteroids begin as a few large ones and shatter into smaller pieces each time you shoot them until they disappear all together.

So what's new in *Blasteroids*? The most striking enhancement is the addition of digitised backdrops behind each screen. On the gameplay side, you now get a ship with the ability to alter its form between three different crafts. One has high speed thrusters, one has more firepower and the last, a lumbering giant has the strongest shields. All sorts of bonuses and spaceships float around the screen giving better weapons and protection against the many dangers. Clear all the screens in the current grid of nine or sixteen and you move on to the confrontation with Mukor. This not so jolly green giant fills the obligatory position of mothership, and once destroyed yields some extra weaponry.

Apart from the spacey backdrops the graphics are all a bit weedy, and although it plays at an acceptable speed the sprites (especially the bullets) would have benefited from smoother animation. The sound is no better; the music soon begins to annoy, and the effects amount to no more than a constant aural assault of scratchy blasts and explosions.

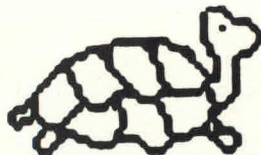
I was never a fan of *Blasteroids* in the arcades, and Image Works' conversion has done nothing to alter the situation. As far as I'm concerned, a few extra weapons and a mothership aren't enough to revive the now tired concept, and justify the hefty twenty five pounds asking price. Take a look if you like the coin-op, but don't expect too much.

T.H.



Graphics: 6
Sound: 5
Playability: 5
Value: 5
Price: £24.95

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FURTHER ENHANCEMENTS...

Mark Smiddy took a look at the long awaited Workbench 1.3 and discovered a mine of new software

Workbench 1.3 has been around for some time now in several different guises with all sorts of curious version numbers: the last I heard of being Omega 8. Now at last the final version has been agreed and the result looks very impressive. The Enhancer software as it is called comes on three disks with a very well produced manual and a very attractive package – all this for less than the price of an arcade game.

The disks comprising the pack are Workbench 1.3, Extras 1.3 and Kickstart 1.3: herein lies the first problem. You can not use Kickstart 1.3 on the newer Amiga 500 and 2000 series computers since Kickstart 1.2 has been included on a ROM already fitted to the machine. This does have the advantage of being more user friendly though and saves the effort of a 2 disk boot every time you switch on.

Incidentally, if you happen to have bought a new machine around since 1988 you may already have the 1.3 Kickstart ROMs fitted. Such machines can be identified by the fact they ask for Workbench 1.3 at startup – although all were supplied with Workbench 1.2. In the event though this anomaly only makes a noticeable difference if you want to boot Workbench from a hard disk – and can cause a few problems with very early games and PD software.

But what about the new Workbench? The most noticeable difference is the lack of the CLI icon. In fact CLI has been replaced by a new version of CLI called Shell. Essentially Shell is a CLI with a couple of important differences. Shell uses a new device peculiar to Workbench 1.3 called NEWCON: this provides console input/output similar to CON: but the lines can be edited using the cursor keys. With CON:, if you made a mistake before pressing return you had to delete the offending characters and start over. Shell also maintains a 2k line history – which means you can recall the last couple of dozen commands and re-edit them.

The story of Shell does not stop there though – it has some extra commands that

should really have been included with the Amiga at the outset. The CLI has really been the bugbear of many a programmer and perfect ammunition for the sternest of critics. Now Commodore have put most of those faults to amends. One of those common complaints was the fact all commands had to be loaded from disk every time they were invoked. This meant two things. Firstly, very slow response to the simplest of commands and secondly a lot of confusing disk juggling.

Shell corrects these problems with a very elegant solution. You simply make the most commonly used commands reside in memory – not in the RAM disk as some have suggested (the solution in Workbench 1.2) but in a special resident structure. This surmounts the need to set up special paths the RAM disk C directory for commands. When a command is invoked Shell checks the resident list for it automatically: if it can not be found, DOS then searches the normal path.

Most of the commands supplied with Workbench 1.3 can be made resident – this is determined by a special protection flag called the pure bit which is new in this release. All commands can be forced to become resident regardless of the setting of the pure bit but this is not recommended.

“For example if you make use of the command ChangeTaskPri a lot it could be shortened to TPri. Or, on a more useful level how about D0 and D1 for DIR DF0: and DIR DF1: respectively”

Another new feature of Shell is the ability to use aliases (pseudonyms) for commands or strings of commands. This makes it possible to shorten commonly used commands to something like

reasonable length. For example if you make use of the command ChangeTaskPri a lot it could be shortened to TPri. Or, on a more useful level how about D0 and D1 for DIR DF0: and DIR DF1: respectively. Nevertheless, aliases must be easily remembered or they become useless. Just in case you do forget; typing Alias or Resident without arguments brings up the list of current definitions.

Something which I have always found a bind with the original AmigaDOS was script files. Up until release 1.3 scripts – batch files if you prefer – had to be executed by typing Execute <filename>. Even by using an Alias to shorten execute to X <filename> this is still a nuisance, so now a new protection flag has been added to identify scripts so they are executed like programs. The command Protect <filename> +S makes a text file an executable script – that is, when you type the name AmigaDOS runs execute and passes the filename automatically thus saving time and effort.

Similarly, it has previously been impossible to execute scripts from the Workbench. Workbench 1.3 includes a neat little program – albeit an old one – called IconX. With Notepad it is a simple matter to create scripts with a suitable project icon and execute them using IconX. And because IconX brings up its own CLI window it is possible to pass a simple command line to the script using the .key argument.

Whilst on the subject of script files it is worth investigating the new startup script supplied with Workbench 1.3. To say the least it has changed quite dramatically to the point where there are now two scripts. Just for starters the first line is a command to patch known bugs in the operating system. No, not just Kickstart 1.2 but 1.3 as well! Whilst it is easy to criticise Commodore for not catching the bugs in the first place; is it worthy of them to fix at least some afterwards.

The most obvious of the bugs lies in the recoverable alert. This looks like the horrid and all too common Guru Mediation –

continued on page 56

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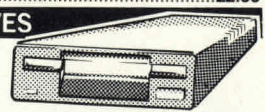


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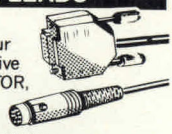


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continued from page 54

but is not supposed to cause a the machine to reset. Without the patch recoverable alerts used to be followed by the Guru. Sounds great, but there is a snag. Recoverable alerts are all too rare – most system crashes cause a Guru anyway.

This includes simple little errors like attempting to free memory already marked as free. Quite why such an error deserves the Guru treatment is beyond me – it

more innocuous bugs have been cured in various aspects of redirection. A few still remain if you care to look hard enough though.

Also new in this release are some interesting devices, programs and partial support for environmental variables. Most useful of these new features is a little program written by Charlie Heath at Microsmiths. Called FastFonts, this clever

RAM – 1Mb machines can not partition enough RAM for this to be feasible. For developers, RAMB0 can be used as a reliable temporary storage device for compiling files to and from – it can even withstand most Gurus.

Enhancer is of course supplied on three disks. The other two being Kickstart 1.3 and Extras 1.3. There really is not much difference with the new Kickstart, although it may well not be compatible with large amounts of software PD and commercial – especially games.

Extras 1.3 is another kettle of fish. The main program on the extras disk is of course Amiga Basic – did we really need another copy I wonder – plus the Basic .FD files and example programs. But just when you thought it was safe to go back in the disk box – comes another great new text editor the Amiga version of Micro Emacs.

As an editor, Emacs is very good there is no doubt about that. But as a user friendly piece of software it leaves a lot to be desired. Just for starters there is those typically non-standard menu selections programmers seem so fond of putting in text editors. Visit-file? What on earth is wrong with terms like Load and Merge? It would take a full-length review to cover Emacs in detail – suffice to say here it is good if you stick with it. Also to be found lurking on the extras disk are some standard DTP fonts – at last. These are Times Roman, Courier and Helvetica and are available in the usual point sizes. As things stand though, there is not enough room to copy them on to the Workbench disk without deleting something else first – I suggest some of the old fonts.

Last but by no means least there is the supplied manual. This, even by Amiga standards is very good. The index – my usual guide to a thorough reference is prolific. It is clearly written but by no means intended for beginners or the faint of heart. Another clear guide to AmigaDOS is useful to have at hand while you study this – although it does point out features other guides have overlooked.

In the final reckoning, the ability to edit and recall commands in a command line environment plus the wealth of extra commands makes the Workbench 1.3 a worthy purchase on its own. Even so you could get the same software and a lot more besides with Vega Technologies superb AmiKit – beginners may well find this the best path to take. However, AmiKit does not include the FastFonts program, Extras 1.3 or the Kickstart disk 1.3. If you do have the money would be wise to consider both. Highly recommended.

M. S.

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Product: AmiKit – an introduction to Workbench 1.3



would be much simpler to tell the faulty program what happened – why victimise the poor user?

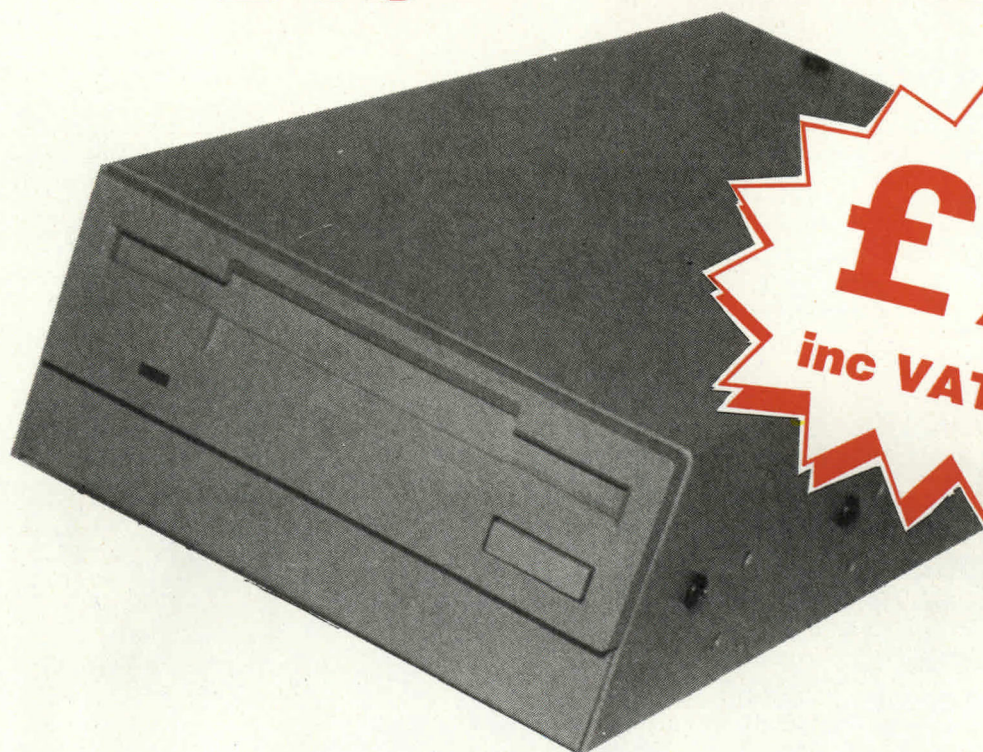
Another bug cured in 1.3 is the redirection to the devices, notably to the NIL: device. The idea here was to send a programs output to a non-existent device and thereby get it to quietly run in the background. The PD program Runback got rid of this problem, however. Other,

piece of software improves the screen output in intuition windows by around 20 percent – the difference is noticeable.

Included with the new devices is the reset-proof RAM disk, RAMB0. Obviously, the designers have retained their curious wit. RAMB0 is only really of any use if you have at least 2Mb of RAM. In this case the entire Workbench disk can be copied to it, and the machine re-booted from



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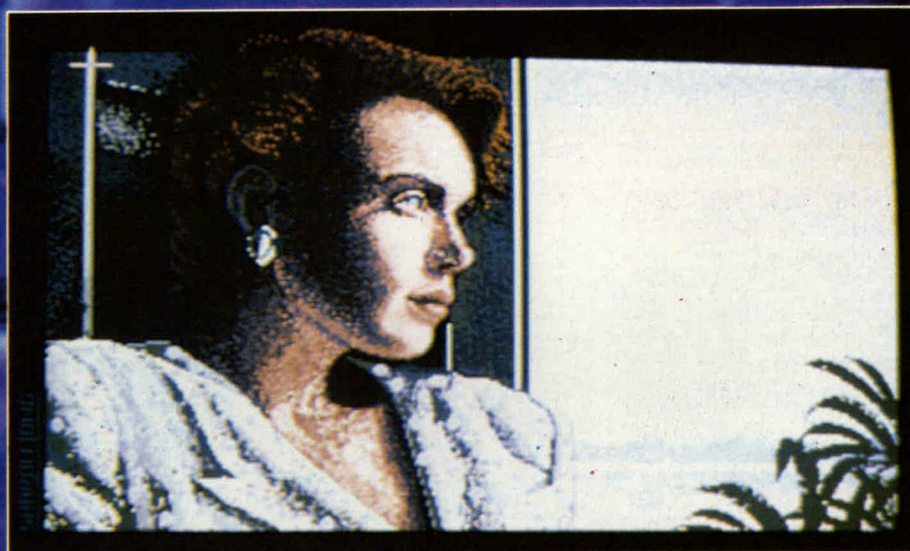
Art is Long

Art is long, says the Latin tag, but life is brief. Could the Romans have anticipated the Amiga and meant Sharon Long?

This month we feature the computer graphics work of Sharon Long, a designer and illustrator who finds the immediacy of working on the Amiga, (using DPaint II almost exclusively), such a revelation that she now confesses to avoiding 'conventional' work as much as she can.

"Although naturally what I'd really like would be a Quantel Paintbox (who wouldn't!), the Amiga offers a realistic alternative, especially with the power and flexibility of DPaint II. Besides, I wouldn't be without the machine for games."





If you like what you see here, then you will be glad to know that you will get the chance to see more, as Sharon has been commissioned by David Crossweller, (New Frontier Productions) for a forthcoming games project.



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GFA BASIC

Andy Eskelson sets a new Basic up against the Amiga standard

There are several BASIC's available for the Amiga, most give a compiled result, that runs as a lone program, without any controlling program. GFA Basic is NOT a compiled system, it is based on the INTERPRETER system, as are 90% of all Basics.

Interpreted Basic is very simple, there is a program running that scans each line that you have entered, and then executes the code that corresponds to the command words that it finds. The big disadvantage of this system is that it is a very slow process. If a command is found that jumps or loops to another line, then the program will scan that line and execute the command words. NO MATTER how many times the loop or jump occurs, the program will still scan and 'interpret' the command words.

Compare this to the operation of a compiler, the command words are converted into a form of code that can run directly, without scanning for the commands.

This means that if there are any loops, the program simply jumps to the correct point and continues running from there. Hence the entire scanning for the command words is removed and this speeds up the execution time dramatically, sometimes by a factor of ten or more.

You may well ask why bother with the interpreter Basics at all, seeing as how good the compiler systems are. Well there are quite a few advantages to the interpreter systems, mainly in the program development stages.

The main advantage is that the programs can be run without messing about with any compiler stages, which normally consist of three stages, edit, compile and link. The link stage can get very complex with large programs and it is common to use batch files to automate some of the process. With the interpreter you just type RUN and the program will start (and probably crash) if it does crash, you get error messages and you can list out the lines with the error, correct the problem and RUN the program again. So the development cycle is very quick.

GFA Basic is already experienced on other machines so the new code is well proven. However the Amiga does present a few problems that have to be overcome, particularly in the Amiga's

library system and graphics interface. In general, GFA has done a good job in these areas, but more of that later.

"Most of the main options are presented as a two line menu at the top of the screen, there are twenty items, ten per line."

The most often used part of any Basic is that which lets you type in your program; the EDITOR. AmigaBASIC's editor is fairly good as such things go, but compared to GFA's editor it is very underpowered. GFA's editor is very keyboard intensive, with only a few functions devoted to the mouse, but I think that this is a good thing, as once you sit down to do some programming, the last thing that you will want to do is keep moving your hand to the mouse. Most of the main options are presented as a two line menu at the top of the screen, there are twenty items, ten per line. The position of the item in the line corresponds to the function key of that number, or the shifted function key.

You can also use the mouse to point at the required item.

Great use of the control key is made, to give the functions like delete line and insert line. I can see that future releases of GFA will enhance the editor even more. In use the editor is very smooth and it can obey a few useful printer control codes, such as headers and footers, line spacing, margins etc.

Every line that you type in is checked for syntax as it is entered, and if incorrect an error is displayed. This helps to get rid of many bugs caused by typing errors and the like.

As you enter the program the editor also indents any loops...so what? Well, this is done automatically! Just forget about the indents completely, the editor will do it all. Unlike AmigaBASIC the GFA editor will remove the indents as the loops close.

I do have one gripe about the editor, and that is the file control requester. It is SLOW and saving your programs is a bit annoying to say the least. The system reads the disk directory before it allows

you to save the program... a bit silly especially if you know the name that you are going to save it as. The file name is kept so the save operation is just a matter of clicking on the save gadget BUT THIS IS NOT OPERATIONAL until the directory has been read, and caused me to call the programmer of that part a few names.

The BASIC itself is VERY extensive with some 360+ commands and access is also provided to 330+ library functions. I found a few problems translating from one AmigaBASIC to GFA. Setting up windows is a little odd, I could not make the border of a window appear, or its sizing gadget until I released it! I found that the window was very easy to set up, and it seems to be a lot better system than AmigaBASIC, but on the other hand setting the various gadgets is not so well defined, however this is not a problem with the BASIC but rather with the handbook.

GFA BASIC limits you to one command per line, so it does make life a little frustrating, but this allows the editor to identify commands and perform the auto indent without any problems. And the subroutine/procedure system has a limitation in that it will only accept ONE RETURN statement, so you have to use various optional tests to get out of a subroutine by means of the exit command.

This is no real problem, but it does mean that a logical program sequence can get cluttered up with what I think is an unnecessary complication, especially if there are multiple conditions to test for.

"Commodore have always had a very bad reputation when it comes to writing handbooks, and it seems that GFA have used the CBM manual as a model for their own!"

In order to overcome this type of trouble GFA does have a very good CASE statement, and if you are writing a

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continued from page 61

GFA BASIC

program from scratch then it is the natural choice to use. However the biggest problems as always are encountered when trying to convert from one BASIC to another.

There is far too much ground to cover within GFA BASIC that I can put down here, but if I did cover the ground it would cure the biggest problem that GFA BASIC has... the manual. Commodore have always had a very bad reputation when it comes to writing handbooks, and it seems that GFA have used the CBM manual as a model for their own! If you were starting out with GFA BASIC then you might find the book set out in a more usable manner. However the handbook is NOT for the beginner at all, there is little in the way of explanation of the use of the BASIC, but on the other hand each command is

very clearly set out, but the example I have stated above with the GOSUB/RETURN is not mentioned in the command for GOSUB, it is only implied.

The very worst problem with the book as I have hinted at is the layout. Someone has got hold of the idea that grouping the commands together e.g. into graphics, loops etc. is a good idea. As far as I can see, and also asking around it seems to be a general opinion, that this method of book layout is totally useless to the programmer. As I have said, the book is not for the beginner, so a programmer will want to find a command as quickly as possible, so a simple alphabetical system is what EVERYONE needs. I found that I was flipping the manual to the main index for almost every command. The only thing that the manual has going for it is that it is a ring

binder, so that it would be possible to reorganise it in a more logical manner, but the index would be useless. It is a bit of a no win situation.

GFA Basic is fine for anyone who has been using it on another machine, but it is very awkward for the beginner or to the newcomer of GFA, so I would hope that in future there will be a few books aimed at the beginner more, in the use of GFA Basic.

Conclusion

GFA BASIC is a very good product, even when you take the few problems that I found into account. The timings that are listed at the end of this review are a fair indication of the efficiency of the interpreter, as it is a very standard Mandelbrot plotter, translated as closely as possible from the Amiga, and as you can see the speed is respectable. The editor is superb, just about the best built in editor that I have ever used. The price, well surprisingly it is £65, which is very reasonable indeed.

Time to generate a 550 by 199 mandelbrot plot

X range of 1.5 to 2

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Superplan

Good business planning can spell the difference between boom and bust.

Peter Lee takes a calculating look at a new spreadsheet.

Businessmen are a pretty cautious lot; they have to be if they intend making a living in a marketplace peppered with pitfalls. Any software they buy has to fit their needs as simply as possible, be robust enough to carry out a variety of specialist tasks, and generally help them towards profitability and good management. They are also sticklers for reliability: a proven track record means a lot in a business where image matters.

Precision Software have already earned a solid reputation for themselves through their Superbase programs. In fact Superbase Professional is considered to be among the best dedicated databases for the machine at any price. Now the Surrey-based firm have released a further program in their range, Superplan, a combination spreadsheet, time management and business graphics utility.

This is a solid workmanlike tool aimed right at the heart of a business - the books. Although some mention of home finances is made, this program will sit squarely on any small businessman's desk (or the desk of his financial controller) with the time to learn its finer points.

The program is supplied on an unprotected disk, but to run, it requires a small, sealed, hardware dongle to be present in joystick port 2 at all times. Annoying, but a simple enough anti-copying device allows backups of the disk to be made and used with the attachment fitted.

Superplan needs at least 1 megabyte of memory to run, and the spreadsheet lay-out has 2048 rows by 1024 columns; the screen acts as a small window over this vast area, the cells being made to scroll horizontally and vertically as needed.

While the program fulfills all the standard requirements of a spreadsheet, it offers a far wider scope than simply number manipulation. It also boasts a superb time-management facility, an integral database of sorts (using the same spreadsheet lay-out), and excellent graphic representation in a number of forms of the data contained in the cells.

Each of these functions share the one sheet - one corner can be used for financial concerns, another area for staff information, and so on; like some giant,

sophisticated (and very smart) wall planner, your entire office management can be contained in one file if you wish.

To manage efficiently, the best information has to be to hand, and resources have to be optimised - this may sound like business-speak, but the ability to plan and cost staff assignments or improvement projects, forecast revenue, estimate the number of men per job, or offset the cost of new equipment against increased profits, makes sound sense.

The ability also exists for locating a critical path through a job and basing your actions on it (as a simple example, there is little point having a painter arrive at a location until after the joiner has finished the woodwork; Superplan will help beat this kind of problem).

Most of you will be familiar with the form that spreadsheets take - insert text or data in a cell, and then by specifying an evaluation in another cell, perform a mathematical function on sets of data already entered. In this way costings can be quickly worked out if the price of a particular product rises, or if the rate for the job goes up; a simple alteration of the relevant figure, a recalculation of the data, and any cell which uses the edited data is updated to mirror the change in global terms.

Actually using the spreadsheet requires the use of special commands, which have a language all their own; it is not an easy task to get to grips with the program's finer points, so the well-designed manual is a big plus.

Help information is available at any time, and is comprehensive and much-needed in the early days. Some functions are available from an on-screen menu via the mouse, but in the main the keyboard is used.

The screen display can have from 2 to 16 colours, and this becomes important when dealing with the program's biggest asset, graphs.

While a row of figures may mean a lot to many people, seeing the data represented as a graphic chart is usually quicker at getting a point across, and Superplan has several options for displaying data. They range from the ordinary bar graph to the exploded pie-chart, and all can be tailor-made for best results. Provided the memory is available, these im-

ages can either fill the whole screen for presentational purposes, or more usually occupy a re-sizable window overlaying your work sheet.

The range of data to be included in the graph is defined by commands on the sheet itself in a kind of programming language; the options are wide-ranging and extremely powerful, and one of the program's chief attractions for me. However, some practice will have to be undertaken before good results can be obtained.

Ten fonts are supplied for adding the legends to graphs, in a number of sizes, and you may even specify the line weighting, and add specialist symbols. The program also supports a wide range of printers and plotters for hard-copy, and can be made to print wide spreadsheets sideways down the paper, which is a nice touch.

The Database functions rely on the same kind of programming criteria as the spreadsheet (referencing data by rows and columns), and are only really useful where some kind of numeric information is available which can be manipulated in either the context of graphics or spreadsheet operations.

Superplan is able to support ARexx, which gives it compatibility with data from other programs similarly integrated; in real terms this means you can draw on data from Superbase Professional and use Superplan's graphics commands to display the information. Data from Lotus 1-2-3 and dBase is also compatible.

Rounding off the program is the ability to create an application through the use of macro commands for automatic execution.

Commands are entered in the worksheet in the same way as text, and their use can be tailored to meet many needs - inputting of data in response to prompts and so on - in fact the many repetitive actions which can be so tiresome.

Conclusion

Superplan is much more than a spreadsheet, but its added features bring a degree of complexity which can be a hurdle to some users. It seems the more powerful an application, the greater expertise it demands. Having all the facilities available in one giant worksheet is a tremendous idea, and a big selling point for the small businessman wanting to get the most out of a piece of software. This is a first-class package in all respects, provided you have some time to invest in mastering it. At just short of £100 it represents good value. But I do have an aversion to dongles, because once you have more than three you can get them mixed up; they are prone to falling on the floor and getting hoovered up (yes, it actually happened to me) or simply mislaid; losing one is like forgetting the combination to the safe - panic sets in and the data is useless. I can see the need for protection, but something more humane please!

P.L.

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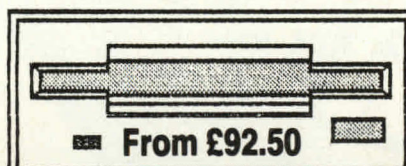
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A long time ago, in a galaxy far away... It had been one of those days. The Galcop had just fined me 5000 credits for trading narcotics with a civilised nation, and the hyperdrive motors were mumbbling trouble again. So when I left the Coriolis station at Lave - cargo hold brimming with computers - I had a Monday morning sort of feeling. Maybe, I thought, those felines over at Reorte would give me a good price - if I made it past the local terrorists.

I hit the hyperdrive for the third time that day and the engines howled into life. Ten seconds later I felt myself thrust into witch space. It was an uncomfortable feeling, rather like floating in a bath of warm slime - almost, but not quite, pleasant. Five years spent swanning around the galaxy and I still wasn't used to it. The drives slowed to a halt and the radar confirmed my arrival in Reorte's system. There was always a feeling of relief on dropping out of witch space, it was the sort of place where one could get hijacked by the ruthless insectoid Thargoids, and just recently there had been a spate of such attacks.

Lining by Cobra with the planet - now just a distant smudge - I hit the local space jump. The ship accelerated in a instant to a little under light speed and jerked to a sudden halt. Pirates! A quick glance at the radar confirmed my suspicion. Three of them, two Kraits and a Mamba coming in fast. This is going to be fun, I thought as I watched the first trying to duck a Lance-Ferman hunt and kill missile. No ECM, no chance - the pathetic creature got his reward right up his machine's exhaust port. Just as the computers registered my kill with the Galcop, the second and third vanished amongst the rain of my pulse lasers. Rewarded by a measly 1.4

credits for the three, I reckoned on not trying to make it as a bounty hunter.

Some time later I started my approach to the station at Reorte. As I prepared for landing, I was confident of a good profit, until the sound of laser fire echoed off the bow. The Cobra's aft shields buckled under fire from the unknown assailant. I hit the retros, and the craft shot back at frightening pace, just far enough to spot - a Thargoid. Only these foul creatures would ever dare attack a trader so close to a space station. I launched a missile - too late the Thargoid had ECM - all I could do was wait for the inevitable and join the struggle in another life...



This is the story of a trader trying to become a member of the Elite. Reckoned to be the best space game ever devised for the 8 bit machines, it all started on the BBC Micro some six

years ago, devised by two university students Ian Bell and David Braben, who later went on to write Zarch on the Archimedes more recently renamed Virus when it appeared in 16 bit form. In those days, the game was the first to feature moving 3D graphics - albeit wireframe - and a real seat of the pants feeling.

If you have never come across Elite before, all this must be leaving you feeling a little confused. You take on the part of a simple soul, fresh out of pilot training. Equipped with nothing more than a clapped out Cobra MKIII spaceship. From here you must trek into the galaxy and by careful interplanetary commerce, enrich yourself, and equip your ship with new weapons. There are over 10,000 planets so you have plenty to choose from.

On the way, you will have to defend yourself against pirates, rogues, thieves and vagabonds and eventually go on missions to save the universe. All of this will set you apart from the usual space flotsam, and you will if you stay alive become one of the most revered space captains - a member of the Order of Elite.

"Trading with planets who will buy such goods can produce great rewards, but they tend to be surrounded by mean pirates"

There are two ways of doing this: legally, by trading in goods like computers, clothing machinery and so on. Or illegally, by the get-rich-quick method of trading in slaves, firearms and narcotics. Criminals are not well liked in the galaxy and there is no honour among thieves. Trading with planets who will buy such goods can produce great rewards, but they tend to be surrounded by mean pirates. Some of them Elite traders who have turned to a life of crime. Also, traders who break the law are marked by the Galcop and can find themselves shunned by the law-abiding planets and refused entry to the systems.

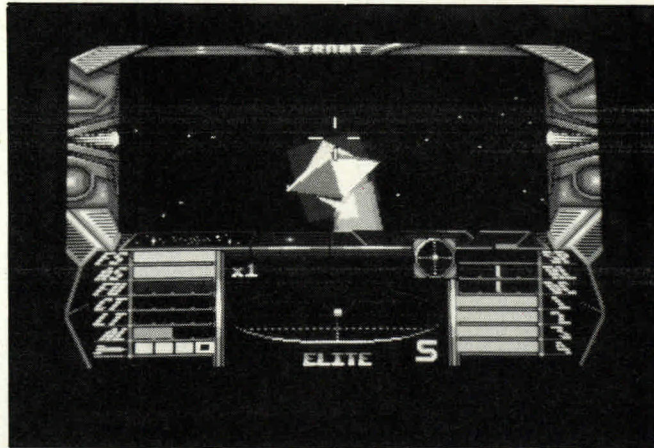
Games like Elite are now almost commonplace, and wireframe 3D is all but unheard of. These days we thrill to the delights of solid 3D graphics in games like Carrier Command and Jez San's superlative, Starglider II. So how well does the conversion of Elite fair against such giants?

The most obvious thing is the solid graphics. Good as the original looked, wireframes on a 16 bit machine cannot be deemed credible. Also, all of the status/trading screens feature some use of graphics. Fans of the original game will no doubt notice this. In addition there are some features, like the Retro thrusters and Cloaking device which never appeared in the original game.

Oddly enough most of the new features do not appear in the supplied instruction manual or key guide either so quite how you operate them is beyond me.

Players of the original will recognise the screen layout at once. The top half of the screen being occupied by the front view, the lower forming the instrument panel and radar screen. The instruments straddling the radar are as follows: front and rear shield power, cabin temperature, laser temperature, fuel gauge, altimeter, missile control, speed, roll, climb, and four power meters. The radar itself takes up most of the lower display.

Here, all objects in the local area appear with the exception of large bodies like planets. The system employed is unusual but well thought out. The radar screen is essentially just an ellipsoid. Dots appear on the screen indicating the positions of objects relative to the ship. If an object is above or below the ship, the radar traces a line above or below the ellipse.



Control, as in the original is by keyboard or joystick, with the mouse a welcome addition. This is to do with the way the game works. Everything in Elite's 3D space has only two degrees of freedom. This means to turn around you have to rotate the ship through 90 degrees and pull back of the joystick - fighter pilots call this a brake turn.

"The experts - I almost made it to Elite, but wore the disk out trying - will find themselves surprised by how hard the new version is"

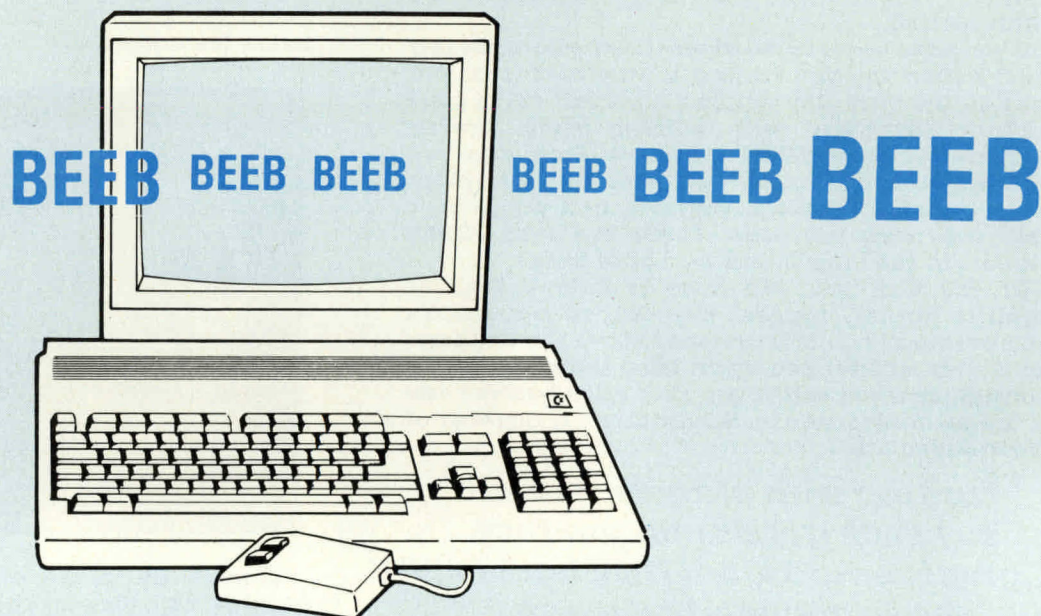
In play, the beginner Elitist, will find himself bemused by the sheer variety of controls and larger number of ways to die. The experts - I almost made it to Elite, but wore the disk out trying - will find themselves surprised by how hard the new version is. This is a problem; of the first four games I had, I was attacked and killed by Thargoids - the meanest of the mean - in two, before managing to dock once. In my opinion it is too hard. When you do get started, Elite plays quite reasonably, but it looks dated for all of its fancy graphics and new options.

The new version just does not feel like a 16 bit game, more of an excuse to capitalise on the success of its predecessor. Little touches like the Blue Danube played during the docking mode are nice, but don't add a lot. The tendency to crash rather too often is annoying. It even has a cheat mode. Hint: type SARA when prompted for a word, then press * while docked. Try it, even buy it - but if you hate it, do not say I did not warn you.

J.F.

Sound: 5
Graphics: 5
Playability: 5
Overall: 6
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CALCULATING AMIGA

Stuart Williams looks at an unusual use for Amiga Basic

The Amiga has one of the most powerful BASIC languages available today, yet many programmers ignore its capabilities to head straight for C or Assembler. For those of us with less than a few years of spare time to learn programming, the excellent Amiga version of the ubiquitous Microsoft BASIC can provide a quick and effective solution for many jobs.

The application of AmigaBASIC to one of my other hobbies, Amateur Radio, is a case in point. AmigaBASIC contains all the mathematical functions necessary to calculate, for instance, the distance and direction of another radio station which I have contacted, to simply and quickly enable the output of specifications for a specialised aerial system for a particular wavelength of transmission or reception, to indicate the values of components required for a particular design of electronic circuit, and even to predict the track of a satellite in orbit around the Earth!

With AmigaBASIC's powerful windowing Intuition-based WIMP environment, the experienced BASIC programmer will have no trouble in producing useful applications programs with a minimum of fuss. Even the inexperienced should find it simple to convert previously written programs from the older generation of 8-bit and IBM compatible computers, many of which use a less sophisticated version of Microsoft BASIC.

A word of caution, however — although the BASIC is excellent, the manual is far from perfect! I would recommend those new to the Amiga to purchase one of the excellent AmigaBASIC tutorial books on the market (see recommendations below) before doing much work with the language. In addition, a particularly useful book for the radio user is *Amateur Radio Software* by John Morris, which contains many useful listings and much technical information for programmers and radio users — it is essential reading. The basic calculations shown in the listings here were adapted from standard formulae included in this book.

While there is not space for listings of the more sophisticated applications

which the Radio Amateur or Shortwave Listener may find useful, I have included two small programs to show what can be done without wearing your fingers out! These are 'quick and dirty' applications, which could be enhanced considerably in terms of user friendliness — the Amiga's speciality. If you feel like adding a few frills for the fun of it, how about a graphical display such as a world map?

"These are 'quick and dirty' applications, which could be enhanced considerably in terms of user friendliness — the Amiga's speciality."

The first program (listing 1) is designed to calculate the Great Circle distance and bearing from your location to that of a long-distance radio station which you have either contacted via your radio transceiver, or have heard on your communications receiver. A 'Great Circle' is the shortest line along the Earth's surface between two points, ie you and the distant station. The items of data which you need to input in order for the program to make the necessary calculations are LATITUDE (north or south of the equator) of your location and that of the distant station, and likewise LONGITUDE (east or west of the Greenwich Meridian). From this, the program returns the great circle distance and bearings. The program uses standard formulae, but since it assumes that the Earth is perfectly spherical (which it is not!) it has a distance error of 0.5%, which is acceptable in most circumstances.

The subroutine Calc.Data contains the actual calculations, and based on the positions and calculating in radians, it is possible to produce the angle subtended by the two points at the centre of the Earth, using AmigaBASIC's COSine and ATN (ARCTANGENT) functions. This central angle, multiplied by the Earth's radius, gives the great circle

distance between the two points or stations. The great circle bearing, or azimuth, is output in degrees converted from radians. This type of program can be very useful for lining up a rotating beam aerial for maximum signal strength with a distant station, and saves a lot of messing about with a calculator!

The second program (listing 2) enables a given Geostationary satellite position given as longitude (in degrees west) to be manipulated to produce the azimuth bearing and elevation of the satellite from your location, in order to align your receiving aerial correctly.

A geostationary satellite is one which takes exactly 24 hours to complete one orbit of the earth, and thus appears to be 'hovering' above one particular spot on the planet's surface. The geostationary orbit is popular for tv and communications satellites, since its apparent lack of motion means that, for instance, a satellite TV dish does not need to track the satellite, and you do not lose your picture as the satellite goes beyond the horizon!

Subroutine In.data asks for the satellite longitude in degrees west. Subroutine Calc.Result calculates the great circle angle between your location and the sub-satellite point. If this angle is too big, the satellite will be below the horizon, so you are out of luck! A suitable message is printed to indicate this.

"There are many more applications in radio to which you can turn your favourite computer, or indeed in any other hobby or application requiring calculations, such as astronomy, engineering, building, surveying..."

Assuming that the satellite is not below the horizon, then the azimuth and elevation are calculated, and, having been rounded to the nearest number of

continued on page 70

continued from page 69

whole degrees, are output to the screen in subroutine Out.data.

This simple but effective program has many applications, the obvious one being satellite TV, but many of you may not realise that Radio Amateurs or 'hams' are able to access their own satellites, uploading and downloading information and messages – however, many of these satellites are not geostationary, and calculation of their position at any one time becomes necessarily more complex.

Just a brief introduction, then, to a few of the possibilities of using your Amiga to help you in the hobbies of

Amateur Radio and Short Wave Listening, and perhaps to provide a challenge to get you using the programming language provided free with every Amiga – AmigaBASIC! There are many more applications in radio to which you

can turn your favourite computer, or indeed any other hobby or application requiring calculations – after all, that is what computers were invented for! Why not have a go, and put some purpose into your computing?

RECOMMENDED BOOKS

Title
AmigaBASIC Inside and Out
 Hannes Rugheimer,
 Christian Spanik
The Amiga Microsoft BASIC
Programmers Guide
 William B. Sanders

Amateur Radio Software
 John Morris

For information on Amateur Radio, contact:

*Radio Society of Great Britain,
 Lambda House, Cranborne Road,
 Potters Bar, Hertfordshire EN6 3JW*

```
REM Listing 1
REM Distant Radio Station Great Circle Bearing and Distance
```

```
PI=3.14159265#: DegRad=PI/180
DEF FNA(X)=INT(X*10+.5)/10
```

```
Home.Station:
```

```
CLS
PRINT "Input Location Data for Home Station or Listening Post"
PRINT "Text input should be in Upper Case": PRINT: PRINT
GOSUB In.Data
HN=N: HE=E
```

```
Distant.Station:
```

```
PRINT: PRINT
PRINT "Input Location Data for Distant Radio Transmitting Station"
PRINT:PRINT:PRINT
GOSUB In.Data
GOSUB Calc.Result
PRINT "Great Circle Distance =";FNA(Distance),"Bearing=";FNA(Bearing/DegRad):
GOTO Distant.Station
```

```
In.Data:
```

```
INPUT " What is the Latitude in Degrees";Degrees
INPUT " and Minutes";Minutes
INPUT " Is it North or South";Direction$
N=(Degrees+Minutes/60)*DegRad
```

```
IF LEFT$(Direction$,1)="S" THEN N=-N
INPUT " What is the Longitude in Degrees";Degrees
INPUT " and Minutes";Minutes
INPUT " Is it East or West";Direction$
E=(Degrees+Minutes/60)*DegRad
IF LEFT$(Direction$,1)="W" THEN E=-E
RETURN
```

```
Calc.Result:
```

```
CO=COS(HE-E)*COS(HN)*COS(N)+SIN(HN)*SIN(N)
CA=ATN(ABS(SQR(1-CO*CO)/CO))
IF CO<0 THEN CA=PI-CA
Distance=6367*CA
SI=SIN(E-HE)*COS(N)*COS(HN)
CO=SIN(N)-SIN(HN)*COS(CA)
Bearing=ATN(ABS(SI/CO))
IF CO<0 THEN Bearing=PI-Bearing
IF SI<0 THEN Bearing=-Bearing
IF Bearing<0 THEN Bearing=Bearing+2*PI
RETURN
```

continued on page 83

PD — FREE GRATIS AND PRACTICALLY FOR NOTHING

Stuart Williams chats with Chet

This month, I'm reviewing a disk imported as a 'Jumpdisk' special, provided by George Thompson Services. The disk, the 'Chet Solace Shareware Extravaganza' is a remarkable selection of twenty-six of the best Shareware and Public Domain programs discovered by Chet Solace on the American bulletin boards last October. According to George Thompson Services, the disk contains about 1.5 megabytes of software and documentation, laid down in a highly compressed self booting format.

While there isn't enough space here to discuss all twenty-six programs, I've chosen four of the best of them to discuss in some detail here.

Pointer Animator

Now this is what I call a real fun Amiga program, which enables you to add a customised feel to your Workbench! Pointer Animator is, of course, a pointer animator! The program enables you to replace your standard Workbench pointer by substituting its own custom pointer and then rapidly cycling the a selection of pointer images to produce animation, and it is really effective. How would you like a pointer in the form of a wriggling snake, an exploding volcano, a 'Boing' ball, or even your own animated company or club logo?

How is all this created? Well, the image sequences are standard Amiga IFF ILBM graphics files. This means that you are able to edit both predefined animation files as well as creating your own. In addition to the normal three colour pointer provided by the standard Workbench, the pointer animator also supports the use of a fifteen colour pointer! This enables creation of some extremely effective graphics, as you can see from the selection of twenty-four predefined animated pointers which are provided on the disk.

Frames can be created and edited in Electronic Arts' 'Deluxe Paint II' or any similar graphics program which can be set up with two or four bit planes (four or sixteen colours), and is able to save rectangular brushes from one to thirty-two pixels wide and high in IFF ILBM file format. A feature which would also be very helpful in the chosen art program is the ability to display the X,Y co-ordinates of the drawing cursor, to enable accurate pixel positioning.

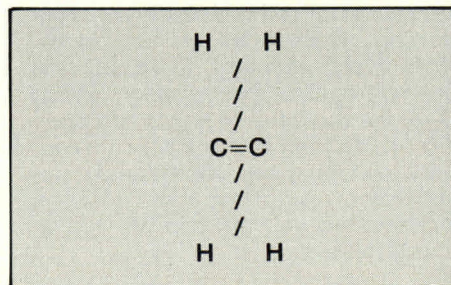
This program is not only a lot of fun, but gives you the opportunity to exercise your creativity and have a laugh at the same time. Perhaps the budding Leonardo's amongst you would like to try an animated series of great paintings or cartoons? Highly recommended!

Pointer Animator is Shareware, with a recommended donation of between \$10 and \$20 if you make regular use of it, to be sent to the author, Tim Kemp, at PO Box 23101, Columbus, OH 43223, United States of America.

MicroView

A little something for the science students or teachers amongst you now - MicroView is a remarkable three dimensional molecular modeller that, while it won't give Sun Workstations much to worry about, could prove a very useful educational tool for demonstrating molecular structure in a graphical form.

If you look at through chemistry texts, you'll find many two dimensional diagrams intended to represent the structure of a molecule like this:



cont. on next page

PD**PD****PD****PD**

While conventional notation, this is hardly inspiring! MicroView, running in 320 x 200 Interlace Mode (effectively 320 x 400 pixels resolution), gives you the capability to examine structural molecular models in colour and three dimensions!

A number of predefined molecules are provided to demonstrate the program, each one when double clicked running MicroView and loading itself. These include Ethane, Sulphur Hexafluoride, Ethyl Alcohol, Sulphuryl Chloride, Sodium Chloride, Boron Tetrafluoride, and Iron Pentacarbonyl.

The great thing about MicroView is of course that it enables you to create your own molecular models, from data files created in an ordinary ASCII text editor. Full details of the file format are provided in the documentation on disk, and all it requires is a little knowledge of geometry and, naturally, chemistry, to set up. The program is invoked from the CLI (although molecules can be displayed from the Workbench), and supplied with the filename of your molecular definition file (denoted by the file suffix .MOL), like so:

1:MicroView Ethyl-Alcohol.MOL

The structural model of the molecule is shown in the upper 75% of the screen, in the form of a series of linked coloured balls. The control panel, which is located in the lower right corner of the screen, contains buttons which, when clicked on by the mouse, enable you to manipulate the molecule and perform special functions, including rotation of the model in X, Y and Z axes, and its speed of rotation.

Options are available to EXIT from the program, show the FULL SCREEN (hitting the left mouse button recalls the control panel), display the LEGEND (indicating which coloured ball represents which element), to RESET the molecule to its original position, and to STOP the molecule in its current position. An RND function to enable random rotation of the molecular model for demonstration purposes has not been implemented yet, but this will not be greatly missed.

I like this program. In the right hands it could be a useful educational tool, as well as being pretty! Once more the Amiga shows its practical ability to be used in the real world as well as the world of entertainment. Highly recommended to all Amiga owning chemistry student and teachers.

MicroView is Freely Redistributable (alias PD) and was written by Guy Wilson Kwok of the United States of America.

Weather Man

This is, would you believe it, a program to forecast the weather! Perhaps the Met. Office should be using Amigas? Seriously, though, the program is based on general scientific principles, some of which were first used in a Public Domain program for the Commodore 64, "Weather Forecaster", by George Mitter. While it won't turn you into Michael Fish (or even Fred Fish!), you could have some fun betting on the weather with your friends using it!

To use Weather Man, you will need a barometer and some means of finding the wind direction (the author suggests weather vane, fancy electronic instrument or wet finger!). Simply enter the information you have gathered into the program by clicking on the appropriate gadget boxes, which include a sliding gadget for barometric pressure, gadget boxes for pressure Rising Fast, Rising Slowly, Steady, Falling Slowly, and Falling Fast, plus wind direction from N, NE, E, SE, S, SW, W, and NW. Once the data has been entered, simply click of the Forecast gadget to receive your weather forecast!

I can't vouch for Weather Man's accuracy, and I would have liked to see documentation of the principles involved included, but as a bit of fun it has possibilities.

Weather Man was written by James David Walley, and is Shareware, copyright (c) 1988 by Bit Player Software of Everett, Washington, USA.

ShoWiz

ShoWiz is definitely one for the video buffs or demo creators - it is a

slideshow, but what a slideshow! It enables you to display individual pictures, or whole disk full if you like. There are twenty-three ways to display your pictures with this program, and it works with pictures created in ALL resolutions, including overscan, which is essential for video work. It is even possible to get ShoWiz to display text files with your choice of text and background colours plus shadows.

While ShoWiz can be used single pictures, text files, or a directory full of such files from Workbench, there is no doubt that the program is at its best when controlled by script files executed from the CLI. These text files contain details of the file required to be displayed, the length of time to display, and the type of wipe to be used. However, if you merely want to display a whole disk full of pictures and don't want to be bothered with details, the program will display every file available and cycle through its wipe effects for thirty seconds each.

The wipe facilities are as follows: simple screen display; display file in five blocks in the order 15324; checkerboard wipe; scroll picture in from the top; display and enlarge 4x; fade in from black; grow from the centre of the screen to its corners. Start in the middle, wipe half of the picture to the right, the other to the left; display then invert; scroll in from left and right and join in the centre; display in four blocks; scroll from left to right; mix screen up into a puzzle then solve it; display from the centre, scrolling half up and half down. Pull the picture down from the left hand corner; display and shrink to a quarter size; scroll from right to left; display in strips; make the picture trail to the right, then left then right again then left. Scroll picture from bottom to top of screen; reverse the picture; expand the picture from its centre; and an option called 'weird', which I haven't yet tried!

As you can see, this is fairly comprehensive! Combined with an overscanning graphics program and a large text TV title generator, would be a real boon to the budding TV producer, or for presenting promotional graphics in business or education. Highly recommended.

ShoWiz was written by J.L. White of the USA, and is Shareware, copyright 1988 by Merlin's Software. Donations of \$10 are welcome, \$15 will bring a disk of picture samples plus the latest version of ShoWiz.

These are just four of the programs on the disk; there are many more. The Chet Solace Shareware Extravaganza is undoubtedly a bargain at £4.99 including P&P.

S.W.
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The first took place on a bright winter's day at Cranfield Airport, a small private airfield near his home. He spent a full hour zooming around in the single engined



Cessna and clearly loving it. Normally a quiet boy, according to his delighted parents, he was bubbling when he came down and was presented by Mirrorsoft's glamorous PR lady, Cathy Campos, with some other Mirrorsoft/Skychase goodies.

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ZVP VIDEOSTUDIO

Lights! Camera! Action? Mark Smiddy puts on his director's cap and focuses on Z-Video.

Equipping a video lab can be a costly exercise at the best of times. Just for starters there is a camcorder to buy, the editing suit, monitors, light...The list is almost endless and could run in to thousands of pounds. However, to produce a really professional product you will need something to put the finishing touches to the work — titles, credits and so on. The Amiga, equipped with a genlock device can do all of this and much more — with the right software at a fraction of the cost of most commercial offerings. This is where Videostudio comes in. At an affordable price, it offers a host of features at your fingertips. But how good is it?

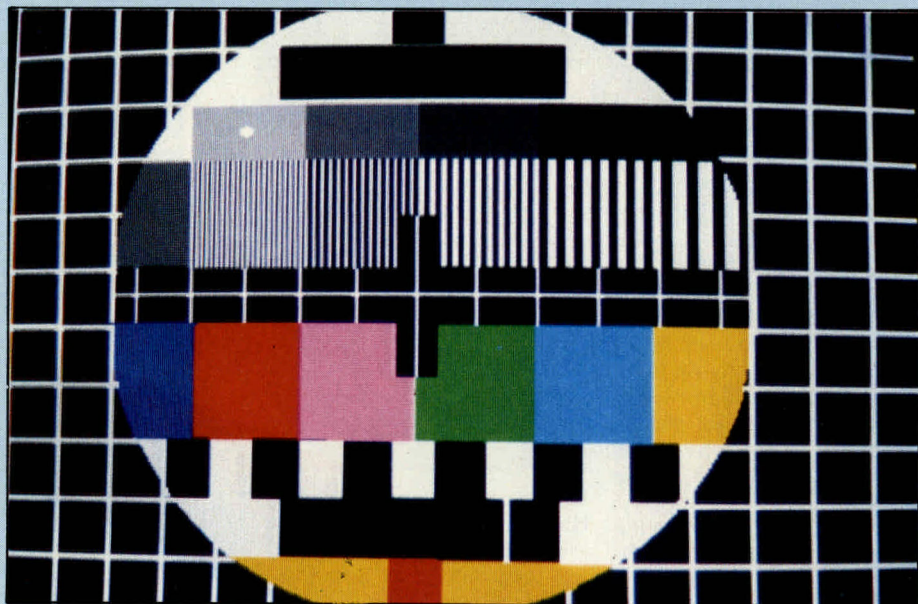
The basic specification for the package is excellent. It comes on two disks brimming with programs and example files, with a manual — in a box about the size of a video cassette case. A quick glance at the manual confirms Videostudio only runs on Amiga's with at least 1Mb and two disk drives, which does, of course, add to the cost. In addition it needs an RTC as fitted to the A501 RAM expansion to function properly. If the clock is not found, as is the case with cheaper expansions, the boot sequence fails.

A quick glance at the manual confirms why — the RTC is used to generate times and dates on some of the overlays — still you can set it manually from the preferences. It also tells something of Z-Video, being probably the worst produced manual I have ever set eyes on for a serious product. Although this may be changed at a later date, mine consisted of 13 photocopied sheets — held together with staples. It did not even have an index, which is a pity since it gives a very bad first impression.

After the disks have been booted, the program is run from the second

disk. It now presents a functions screen consisting of a series of nine tasks. From here you can gain access to all of the major sub-programs in the package. Here is the second disappointment. The whole package is held together by a set of numbered menus — there is no use of Intuition requesters or menus whatsoever. The only one I did manage to find refused to work properly. At other times clicking the right button cause the machine to hang up.

"There is a full set of testcards to help set up your system — although as the manual states these can only be used as a guide — the Amiga was never designed as a broadcast test rig."



This got me wondering what language Videostudio was written in. A C or machine code programmer would normally use overlays. Sure enough, it was written in BASIC! Not that I have anything against BASIC or its use in commercial packages — but the end must justify the means and Videostudio sadly, does not.

When it works, Videostudio has very good features indeed. And if you are prepared to battle through it, it

can produce very good results. For instance, there is a full set of testcards to help set up your system — although as the manual states these can only be used as a guide — the Amiga was never designed as a broadcast test rig.

Other features of note are the clock options. The program caters for several different types, including a station clock — like the one use by Channel 4 and some digital designs. One even

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**ZVP
VIDEOSTUDIO**

includes a frame counter. In addition the program includes all of the features necessary to perform some very impressive scrolling titles genlocked on to the screen. Scrolls can be either horizontal or vertical and displayed alongside a variety of different frames.

The power of Videostudio is its ability to load IFF picture files and display or genlock them with text and scrolling messages. However, the program can only display up to 32 colours and the resolution/colour format must be known in advance. It can not glean this information from the picture file itself. Similarly, messages are entered via quite the most awful editor I have ever come across. Why did they not think to include the ability to load simple ASCII files?

I showed Videostudio to an associate of mine who works in a video department. His comments: "This package is of special interest to amateur video producers everywhere and should improve the quality of



their finished work immensely. But, it is of very limited use to professional or semi-professional groups, who will probably already have the facilities to produce similar displays more simply and quickly."

In the end Videostudio is a story of what could have been. It could have been wonderful — had Z-Video had the tenacity to juggle with Intuition rather than using outdated menus. It is a product which has a lot of good ideas, many of which can not be found anywhere else — but getting at them requires a lot of needless button pushing. All the same, if they iron out the bugs, add a lot more polish and get someone to write them a decent manual — then Videostudio will take some beating. As it stands — I can not really recommend it at the current price.

M. S.

Price: £79.95

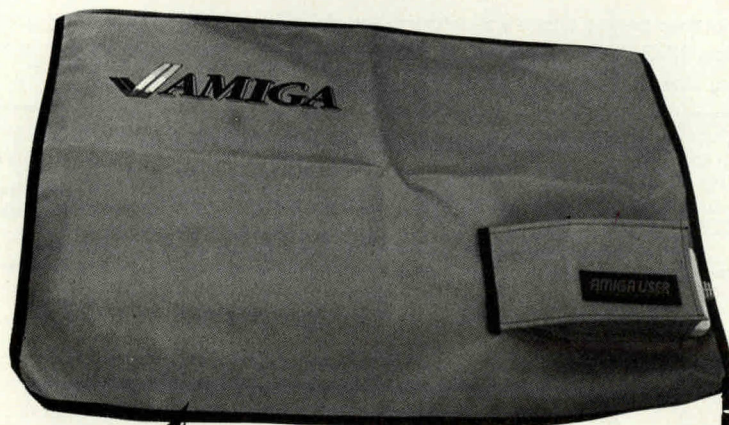
Contact: Z-Video products, 11
Danacre, Laindon, Basildon, Essex,
SS15 5PT.

Plus Points: Very wide range of features, plenty of good quality fonts, can load some IFF pictures, does not need genlock.

Drawbacks: No use of intuition; tendency to "hang up"; needs a meg to run.

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LATTICE DEVELOPMENT SYSTEM 5.0

Bill Harvey examines Lattice's latest release, which looks likely to win some new friends among new Amiga users.

Lattice have just released a new version of their AmigaDOS C Compiler package. It's called the 'Lattice Development System (version 5.0)' and that, in a nutshell, is exactly what it is..... a complete and well integrated environment for the development of both C and assembler programs. Version 5.0 gives you a C compiler, an overlay linker, a Screen Editor, an optimizer, an assembler and an applications profiler. The complete set of Lattice Compiler Companion utilities (reviewed - A.U.I. December 88 issue) are also provided together with a whole range of other utility programs. The function library which Lattice provide is still growing and it now contains nearly three hundred pre-written functions. The most startling addition to the package is a new piece of Lattice software known as a 'Source Level Debugger' - this is a very sophisticated monitor that enables you to execute a compiled program..... and see the C source code displayed as it runs! You can examine variables during execution, set breakpoints, view and modify register data, and even look at the corresponding assembly language code. 'CodeProbe', which is the debugger's name, is absolutely brilliant and has had more than a few of us at A.U.I. fighting to use it.

The new compiler has undergone various internal enhancements which, at the end of the day, means that it now produces faster and more compact code. There have been some algorithm improvements and this, together with a bit of extra assembly language coding, provides some quite noticeable performance increases. The compiler now supports code generation for the 68000 - 68030 range and the 68881/68882 maths co-processors. There is an ANSI committee currently in the process of examining the C language in order to remove a few trouble spots in the existing language and this will eventually

lead to a formal ANSI language standard being published. Lattice have representatives on the ANSI committee - so it is not really surprising that their compiler is almost fully compatible with the current ANSI proposals.

The Development System comes on five disks together with two manuals. As usual, Lattice's documentation is excellent and despite the fact that the manuals contain a lot of material the layout is such that it is easy to find your way around. The initial sections of the first manual provide the user guide. This outlines the relationship between Lattice C and the original Kernighan and Richie text and, together with a discussion of the compiler implementation, puts the Lattice package into perspective - it makes interesting reading. Each module, each utility and every command is explained in detail and to help the beginners on their way there are a number of simple examples available. Additional examples are also provided on the release disks themselves. The function library routines are particularly well documented and a comprehensive master index ensures that information can be found quickly and efficiently.

Several new options now exist... the compilers response to various error conditions can now be directly controlled and it is possible to change the optimization emphasis which means that you can either minimize the code size or minimize the execution time. Some additional keywords are now available including the long awaited 'chip' keyword which allows the programmer to place objects directly into the Amiga's lower 512K of chip memory.

Lattice have also chosen to include the complete set of Compiler Companion utilities. It's not long since we looked at these so here's just a brief run down on what you get:

CXREF produces cross-reference listings from C source files. It creates

tables showing functions, labels, definitions etc. and details of their location.

DIFF is a utility which lets you compare files and determine differences between them.

EXTRACT and BUILD enable you to automate complex sequences.

FILES is a file manipulation utility.

GREP searches sets of files for specified character patterns. It is a very useful utility and because the functions/headers are also included with the Compiler package you've got a ready made way of putting these search facilities into your own programs.

LMK is a utility which is used to co-ordinate the maintenance of projects involving multiple files.

SPLAT is a line based editor similar to 'Edit' but more sophisticated.

TOUCH adjusts the time and date stamp on specified files.

WC displays the number of characters, words and lines in the file. It is often used to provide a rapid check as to whether files are the same or not.

The Lattice Screen Editor (LSE) has been around for quite a while both as a separate package and as part of earlier professional development packages.

"you can have several files open at once and you can move blocks of data from one file to another - this makes duplicating sections of headers and define blocks, moving routines from one source to another etc., a piece of cake."

For many years I must admit that LSE was one of the few Lattice products which I did not seem to use. All my assembly language and C source code was prepared using a wordprocessor and because I was happy with the arrangement I saw little reason to

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change.

When I finally did get around to playing with LSE I was pleasantly surprised to find that it is actually very good. For a start you can have several files open at once and you can move blocks of data from one file to another - this makes duplicating sections of headers and define blocks, moving routines from one source to another etc., a piece of cake. This can save lots of typing but more important than that, it tends to encourage consistency. LSE's keystroke commands are user programmable so it is quite easy to make LSE mimic another editor if you so wish, although I must admit I've never bothered to do this myself.

The editor supports all the normal search and search/replace facilities and these not only include simple string based search but 'grep' type pattern searching as well. Using LSE you can write your source and compile it directly from memory. A single keystroke invokes the compiler using your pre-defined compiler and error checking options and this then passes any error information back to the LSE. This arrangement speeds up the overall compile/edit cycle and is something that you will not get with other editors. Another timesaver that LSE provides is a macro facility..... combinations of commands and strings which you use frequently can be saved as 'macro commands' that can be recalled with just a couple of keystrokes. There is a variety of other facilities available including on-line help, auto-indenting, word-wrap, and special modes for assembly language programmers.

The global optimizer, GO, is a piece of software which seeks to generally improve the performance of a program. It analyses a quad file, performs several types of optimizations, and produces another quad file. Again this has been used by Lattice on their existing library routines. GO looks at register assignments, unused variables and code, it identifies and merges common sub-expressions, pulls invariant calculations outside of loops and looks at a host of other areas as well. It's a clever piece of software but for the end user the results are simple - you end up with improved code.

The Lattice profiler is another useful software tool. It enables you to analyse a program's operation and obtain statistics concerning the execution times of the individual routines. This helps you to identify those areas where code changes might make significant improvements - it is a very useful piece of software to have and is one that Lattice themselves put to good use.

Lattice have included a full specification assembler with the development kit and of course all of the necessary '.i' header files are included as well.

Assembly language on the Amiga is not everybody's cup of tea but, strangely enough, once you have got used to the Amiga's operating system it can even become good fun. You might not necessarily want to get involved with assembly language to start with - but it is nice to know that the tools will be there if you ever need them. The serious amateur or professional programmer will know the benefits of a mixed code approach because there are lots of advantages to using C for the bulk of your work but handling certain performance critical areas with assembly language.

The compiler supports the use of precompiled header files, includes several of the ANSI encouraged built-in functions and has the facilities for creating 'load-and-stay-resident' programs. Several other items are provided with the development package including an fd2pragma utility which converts Commodore FD files into pragma statements that can be used within your C program. There is also a traceback utility

"There is also a traceback utility which can catch Guru type program termination problems."

ity which can catch Guru type program termination problems. Traceback is used in conjunction with a special start-up routine and allows you to retrieve the run-time stack data, the registers at the time of termination, the memory, application data and the environment info. It's not a tool for the beginner primarily because you need to be happy with both 68000 assembly language and with the Amiga's operating system for the information to be of use.

CodeProbe

CodeProbe, Lattice's new source code debugger, is a fascinating piece of software which enables you to monitor the execution of a compiled C program. You actually see the program execution in terms of the C source code..... as the program executes. Compiling a program using one of the debugging options allows CodeProbe to provide the magic link between the original source and the program's executable form. As the program executes the appropriate source line is highlighted. Lines which reference a function can be executed in one go or you can 'step into the line' and single step through the whole of the function call. You can set breakpoints, examine variables, display memory and register contents, modify data and even look at the assembly language equivalent of your source. CodeProbe can identify variables in terms of their original C declarations and has a host of other options that are very useful.

CodeProbe is not just a brilliant debugging tool - it is a tool which has enormous potential uses for learning about the Amiga in general. I've already spent a lot of time with applications programs that work perfectly well just looking at window and screen structures, rasters, file info blocks and other system structures etc. Being able to actually look at these types of items during program execution opens up new horizons for the serious user.

Conclusions

This package is going to get the 100% 'rave review' treatment for the best reason in the world - I just can't find anything about it to fault it. Lattice produce tools for the professionals and have built their reputation on reliable, well supported, software. For a small fee (which I believe is around £40) existing Lattice users can upgrade to version 5.0 and the CodeProbe debugger alone would make the upgrade worthwhile. Lattice look after their existing users well, but oddly enough I think that on this occasion the people who will gain the most are going to be the totally new users. The Amiga has attracted many serious users who realize that it is a machine which you just cannot program effectively unless you have a working knowledge of C. Even competent assembly language programmers would not dispute this fact because almost all technical manuals and serious Amiga reference books will assume you are a fluent C programmer. You cannot become a fluent C programmer unless you are given the chance to practice and learn - and to do that you need a C compiler. For several years now I have been listening to people saying 'I'll start learning C when a cheap C compiler arrives'. These people are still waiting and, unless I am very much mistaken, they will still be waiting by the time the rest of us know the Amiga inside and out.

The new Lattice package will retail in the U.K. at around £200 but, for the serious user, this could be the most productive investment you have made since you purchased your Amiga. Good software, masses of utilities, excellent documentation, all from a Company with a reputation that is first class goes to make the Lattice Development System 5.0 quite simply the most impressive package I have ever seen for the Amiga. It provides an environment that has earned the respect of a great many professional programmers, yet it can be used effectively by a serious beginner to both learn about C and learn about the Amiga. If you have thought about getting involved with C on the Amiga then the time to start doing something about it has arrived. I kid you not, this package has got to be seen to be believed - it is worth every penny of the asking price and more.

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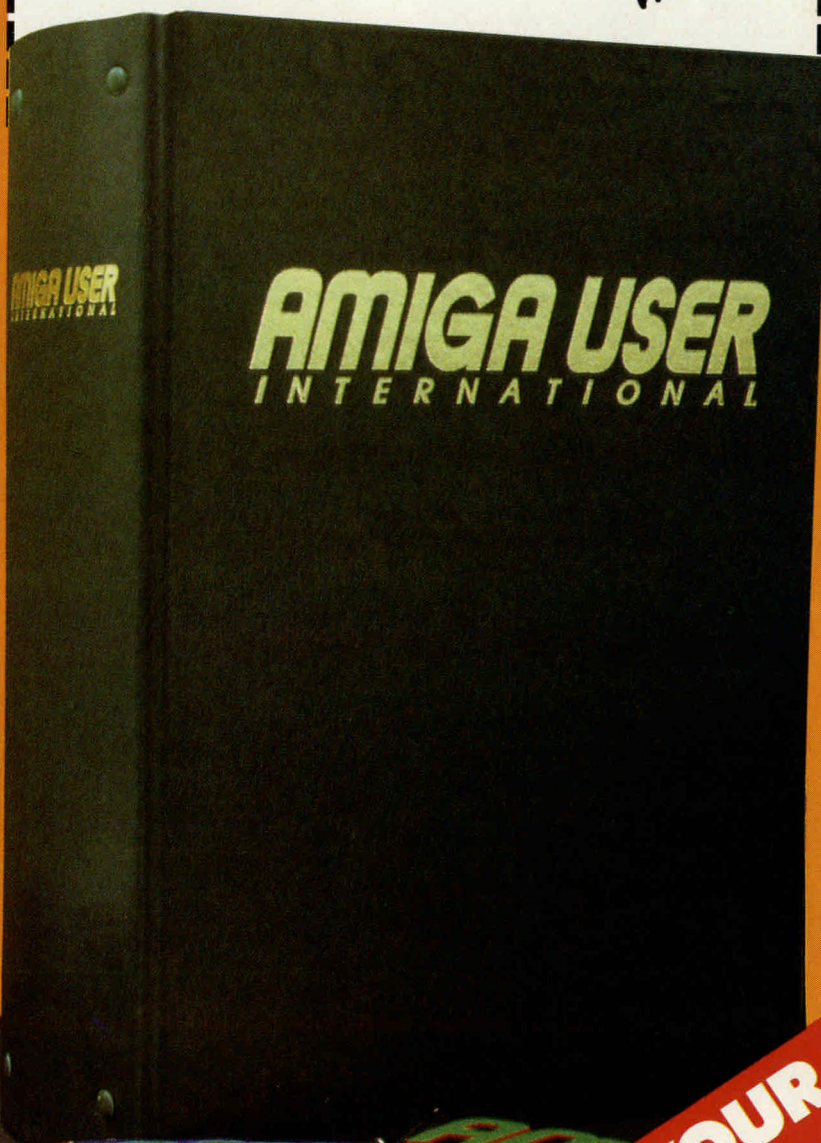
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continued from page 70

CALCULATING AMIGA

REM Listing 2
REM Geostationary Satellite Locator

REM Constants - amend these for your Station/Listening Post location

Latitude=56.113 : REM Station Location (Degrees North)
Longitude=3.575 : REM Station Location (Degrees West)
PI=3.14159265# : DegRad=PI/180

Startup:

CLS
PRINT "Geostationary Satellite Locator"
PRINT :PRINT "All text input should be in Upper Case"
PRINT :PRINT

In.Data:

INPUT "What is the Equator Longitude of the Satellite (Degrees West)";C
PRINT
PRINT "Geostationary Satellite located at";C;"Degrees W":PRINT
PRINT "Home Station/Listening Post located at";Latitude;"Degrees N, ";Longitude
;"Degrees W"
PRINT

Calc.Result:

Latitude=Latitude*DegRad: Longitude=Longitude*DegRad: C=C*DegRad
DC=COS(Latitude)*COS(C-Longitude):DS=SQR(1-DC*DC)
D=PI/2-ATN(DC/DS)
IF D>1.41895 THEN GOTO Hard.Luck
J=-SIN(Latitude)*DC/(COS(Latitude)*DS)
IF ABS(J)>.9999 THEN J=SGN(J)*.9999
Azimuth=90-ATN(J/SQR(1-J*J))/DegRad
IF C>Longitude AND C<(PI+Longitude) OR C>(2*PI+Longitude) THEN Azimuth=360-Azimuth
Elevation=ATN((42171#*DC-6371)/(42171#*DS))/DegRad

Out.Data:

PRINT "Azimuth Bearing from Home Station to Satellite =";INT(Azimuth+.5);" Degrees"
PRINT "Elevation from Home Station to Satellite =";INT(Elevation+.5);" Degrees"
PRINT:PRINT
PRINT :PRINT "Press any key to run again"

Hang.On.A.Bit:

Pause\$=INKEY\$: IF Pause\$<>" " THEN Startup ELSE Hang.On.A.Bit

Hard.Luck:

PRINT "Too bad - the Satellite is below your Horizon!": GOTO Startup

Intuition

Part II

This month Mike Nelson explains the IDCMP and its various uses.

Some of the flags may at first sight seem a little frivolous but a closer look at the system reveals their *raison d'être* (I wonder if they can print a circumflex!). The most friendly way of checking for these messages is to use the Exec function `WaitPort()` which literally sends the program to sleep until something happens to wake it up. If the program is constantly checking for disk changes or timer information then it is using up valuable processor time in doing so. This can seriously slow down the overall operation of the machine and will annoy your user intensely, as all they want is to have your program available at the flick of a mouse button and to only speak when spoken to. Hence these flags can be very useful in minimising the processor time taken up by your program when it is basically doing nothing constructive. Of course there are programs such as a graphics game where you have no choice about going to sleep, because the `INTUITICKS` events are simply not frequent enough to wake up the program for a sufficient time if, for instance, there is a lot of number crunching involved for fast animation. However you should always give the user the option of sending the program to sleep. How can you code this?

The answer lies in the method used in scanning the `IDCMP` for incoming messages. You can either do a `WaitPort()` as described earlier or check frequently if there is a message present yourself, on a flying visit using the `GetMsg()` function. The program below can use either method— all you have to do is to delete the `WaitPort()` call, leaving the `if (message = GetMsg())`.... Another alternative is to use a while loop to read every message at the port before returning to `main()`. The exact choice really depends on your program and mood as there are certain benefits from each different mechanism.

So to this month's program. I have christened it *ComDem* in an uninspired moment as it is a demonstration of Intuition communications. Its aim in life is to open a window in the Workbench screen, with all the usual paraphernalia and report on key presses, disk changes and display the internal time in the title bar.

This may sound quite awesome but the code is quite small and a something of a bare bones affair but it should illustrate some of the points raised above.

Firstly, the `NewWindow` structure has the `IDCMPFlags` member set to cause appropriate `IntuiMessages` to be sent to the `IDCMP` of the Window. The latter are generated by Intuition in response to the `OpenWindow()` call. The other global variables are also handled here.

I have deliberately kept `main()` quite small as the program doesn't really do much and it is probably wise to delegate the opening and closing to specific routines.

The `doIDCMP()` function is the "mission control" of the program and warrants some explanation. The variables it uses are a pointer to the message structure (allocated in the Window → `UserPort` bit) and a little counter to ensure that the routine only responds to every seven `INTUITICKS` messages.

The use of `WaitPort()` has been discussed previously and the statement can be omitted completely as the next line checks if a message has been sent before proceeding.

It is very important to reply quickly to messages using the `ReplyMsg()` function from Exec. This is because Intuition can be held up with the verify messages and the rest of the computer can grind to an unceremonious halt if Intuition is waiting for you to finish drawing the Mona Lisa in HAM before allowing a menu to be constructed. Further, you will not receive any more `INTUITICKS` messages once one is posted and not cleared by a `ReplyMsg()`. It is probably advisable to avoid doing any hefty processing in the `doIDCMP` part of the program as `IntuiMessages` are queued up until you `ReplyMsg()` to them individually so you could gum up the works (to be technical about it) if there are too many messages littering up the system.

Once a message has been received and a reply sent (thereby clearing the port), the routine sorts out which message was present. The `IntuiMessage` structure is examined for this and the switch statement is a convenient way of proces-

sing the Class member. In the event of a `VANILLAKEY` message (generated by pressing a key) the program simply prints the character assigned to variable `c` and `main()` checks this for the space bar which can be used to quit the program.

A `CLOSEWINDOW` is generated by clicking on the appropriate gadget but Intuition merely tells us that this is what the user wants: it is up to the individual program to physically call the `CloseWindow()` function and see to de-allocating its non-Intuition handled resources.

The program receives about ten `INTUITICKS` a second but we only call the `DateStamp()` routine once every seven ticks as the clock is only accurate to within 1 second or so.

I included the disk checks for fun as all the program does is to flash the screen using Intuition's very own screen flash function. Perhaps this could be extended to play a sampled sound or something equally as trivial!

`BuildTimeString()` reads the `DateStamp()` internal time and converts the unfriendly `LONG` format into hours, minutes and seconds. It then uses these to build a string of nine characters stored in array `Tim[]` and terminated by a `NULL` character. The `SetWindowTitles()` function is then used to display the current system time in the title bar of the window. The calculations are not particularly accurate and if you run the Workbench clock program at the same time you find that the program only gives an approximation of the time. I have used conditional expressions to pad out the string with leading zeros so the time is always displayed as six digits.

In conclusion then the `IDCMP` is a very versatile and flexible arrangement and is relatively easy to employ. Your program can find out exactly what is going on with Intuition doing all of the hard work. However, there are always alternatives such as the console device but, although being more powerful, this is much more complicated to use.

M.N.

continued on page 86

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Intuition

continued from page 84

```

/* This is called ComDem because it demonstrates the communication
   prowess of Intuition. It will open a window in the Workbench screen
   and display a clock in its title bar whilst checking for key presses
   and people changing disks. This seems enough for starters. */

#include "exec/types.h"          /* Everyone does this */
#include "intuition/intuition.h" /* This is pretty obligatory too */

struct IntuitionBase *IntuitionBase;
struct Window *Window;

LONG time [3];

struct NewWindow NewWindow = {
    20, 20, 300, 100, 0, 1,
    VANILLAKEY | CLOSEWINDOW | INTUITICKS | DISKREMOVED | DISKINSERTED,
    WINDOWCLOSE | SMART_REFRESH | ACTIVATE | WINDOWSIZING |
        WINDOWDRAG | WINDOWDEPTH | NOCAREREFRESH,
    NULL, NULL,
    "Dedicated to my fish!",
    NULL, NULL, 100, 25, 640, 200, WBENCHSCREEN};

char c; /* From keyboard scan to control program */

void main(), doIDCMP(), OpenStuff(), CloseStuff(), BuildTimeString();

/* main() actually does very little except delegate the work.
   I'm sure we all know someone like that...*/

void main(){
    OpenStuff();

    while (c != ' '){          /* This routine (and hence the program) exits   */
        c = 'q';              /* when the CloseWindow gadget or space bar is   */
        doIDCMP ();           /* pressed. Here would be the place for the   */
    }                          /* program to do something useful with the info */

    CloseStuff();             /* Keep thing separate so main() is small      */
}

void OpenStuff(){
    /* Open up the intuition library for use by moi */

    IntuitionBase = (struct IntuitionBase *)          /* These 2 lines are */
        OpenLibrary ("intuition.library", 0); /* one statement.    */
    if (IntuitionBase == NULL) exit (FALSE);          /* Just checking */

    /* Now open the window in WorkBench screen and check it exists.
       If something has gone wrong, give up after closing library */

    if ((Window = (struct Window *) OpenWindow (&NewWindow)) == NULL){
        CloseLibrary (IntuitionBase);
        exit (FALSE);
    }
}

```



```

void CloseStuff(){
    if (Window) CloseWindow (Window);
    if (IntuitionBase) CloseLibrary (IntuitionBase);
}

/* This next routine is the business end. Opening the window gives us the
   Exec message port which Intuition uses to inform us of the various
   events we requested in the NewWindow structure at the top of the program.
   The WaitPort () statement can be omitted but the program wastes more
   processor time then because we don't go to sleep. */

void doIDCMP(){
    struct IntuiMessage *message;
    static int ticks;

    WaitPort (Window -> UserPort);
    if (message = (struct IntuiMessage *) GetMsg (Window -> UserPort)){
        ReplyMsg (message);
        switch (message -> Class){

            case VANILLAKEY: /* Has a key been pressed? main() gets c */
                c = (char) message -> Code; /* Code is actually a USHORT */
                printf ("Message -> Code =%d, c = %c\n", message->Code, c);
                break;

            case CLOSEWINDOW: /* Intuition only tells us we have to do it */
                printf ("Closewindow has been selected\n");
                c = ' '; /* I'm cheating here slightly since main() checks */
                break; /* for the space bar which also quits the program */

            case INTUITICKS: /* Get about 10 per sec but only act after 7 */
                if (ticks++ == 7){ /* Every 7 ticks */
                    ticks = 0;
                    DateStamp (time); /* This is in the DOS library */
                    BuildTimeString(); /* This is mine! */
                }
                break;

            case DISKREMOVED:
                DisplayBeep (NULL);
                break;

            case DISKINSERTED:
                DisplayBeep (NULL);
                break;

        } /* end of switch */
    }
}

```

Intuition

cont. on next page

continued from page 87

```
void BuildTimeString () { /* Takes array v and uses minutes & ticks to */
                          /* build up a string for the window title */
    char Tim [9];          /* The speaking clock no less. Format HH:MM:SS */
    USHORT Hours, Mins, Secs;

    Hours   = (USHORT) time [1] / 60;          /* Convert internal Dos format */
    Mins    = (USHORT) time [1] - (60 * Hours); /* to 3 USHORTS before ASCII */
    Secs    = (USHORT) time [2] / 50;

    /* The calculations may look obtuse but the conditionals are to pad */
    /* out values which are less than 10. So 9:24:3 becomes 09:24:03 */

    Tim [0] = (Hours < 10) ? '0' : (Hours / 10) + '0';
    Tim [1] = (Hours < 10) ? '0' + Hours : (Hours % 10) + '0';

    Tim [2] = Tim [5] = ':'; /* Colons to separate digits */

    Tim [3] = (Mins < 10) ? '0' : (Mins / 10) + '0';
    Tim [4] = (Mins < 10) ? '0' + Mins : (Mins % 10) + '0';

    Tim [6] = (Secs < 10) ? '0' : (Secs / 10) + '0';
    Tim [7] = (Secs < 10) ? '0' + Secs : (Secs % 10) + '0';

    Tim [8] = '\0'; /* Use NULL to terminate string */

    SetWindowTitles (Window, Tim, -1);
}
```

In the following issue, Mike Nelson considers how menus may be employed in your Intuition programs.

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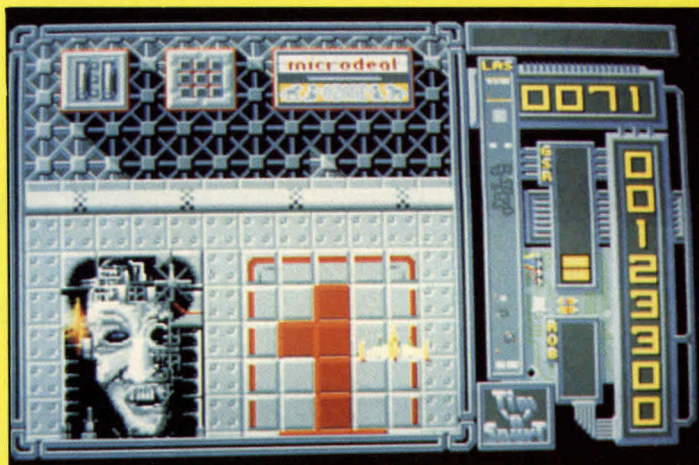
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When the original Goldrunner was released it was generally well received, but much of its popularity can be put down to the absence of any real competition. Amiga (and ST) owners jumped at the chance of playing a half decent shoot 'em up on their new wonder machines, even if it were only a Uridium-clone turned through 90 degrees. Now the situation is very different with a number of established favourites in the 16-bit shoot 'em up field, so it was interesting to see how Goldrunner has changed with the times.

As before, the game is played in a window on the left of the screen, the right is again occupied by various scanners and readouts. Although at a glance the sequel looks almost identical to its forerunner, there have been some important changes in the



GOLDRUNNER

II

Microdeal

gameplay. Instead of simply blasting every destructable on the current level, your mission now takes a more Defender-influenced route.

It is a story of prisoners, rescue pods, mutants and for a change, friendly motherships. These prisoners whizz around small track networks. Shoot their outer shell and a rescue pod is sent in to pick them up. Once a pod finds its target it sits on it letting loose a few defensive shots. Zap it now and the core is left for you to pick up and put down on the dropzone. Sort that lot out and the mothership comes along to warp you to the next level. Thankfully there are far fewer obstacles to dodge, so there's a lot more freedom to move around.

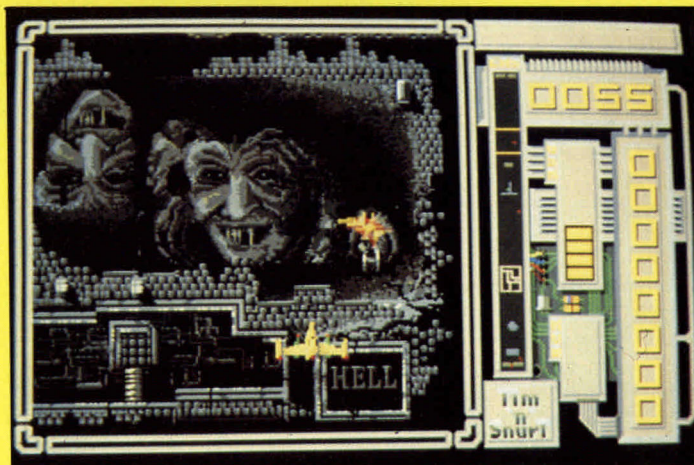
Most of the time the scrolling is perfectly

smooth, but this comes at the cost of a reduced game window and very small aliens. It runs into problems when anything more than a few tiny sprites are on screen, and it is here that its ST origins are most prominent. I don't like to go on about the old ST conversion argument, but such a straightforward task should not set any problems for the Amiga, and it is about time more UK software houses started taking note of European and American standards (Denaris and Sword of Sodor for example).

Sound and graphics are both forgettable. The music is without either a good tune or beat, and the effects are merely basic warbles. Background graphics included on the master disk are a patchwork of blocks and tiles, but those included on the extra data disks are more imaginative.

Despite all of its familiar features, the inclusion of a more involving gameplay basis does make for a more enjoyable game than you might expect. The trouble is that everything is very unspectacular; no hyper-destructive weapons, inoffensive-looking enemies and a feeble effect as your ship bites the dust. At least an effort has been made to develop the gameplay of the original game, but even so Goldrunner II is behind the times.

T.H.



Graphics: 6
Sound: 6
Playability: 6
Value: 6
Price: ???

TO THE RESCUE!

Editing Floppy Disks – Part 3

In part 1 of this series, the general layout of Amiga diskettes was discussed, along with the basic information about using disk editors. In part 2, the structure of the directory blocks was covered in detail, including some suggestions for restoring or removing files from a directory 'by hand'. In this final part, the structure of the remaining files will be presented.

FILE HEADER BLOCKS

The first six words of a file header block are much like those of directories, but the usage is a bit different:

- Word #0** – File type – which is 1
- Word #1** – Header key – the number of this block (integrity check)
- Word #2** – Highest sequential number – number of blocks in this file
- Word #3** – Data size – number of data blocks listed in this block
- Word #4** – First data – number of the block where this file starts
- Word #5** – Checksum

Most of this is easy to understand. It is also very useful. The highest sequential number can tell you how many data blocks you should have, and you can hand-check the file against that number. Should the chain have been broken somewhere, you won't get the correct number of blocks, and may have to go down the list block in order to locate that vital data. The data size indicates the number of blocks listed in this block alone. If the file is longer than seventy-two blocks, there will be an extension block to list the next group of data blocks, and the number of the extension block will be the next-to-last longword in the block. The number of the block where the first block starts is necessary if you must trace a file by hand. You start there, find the location of the second block, and trace it through until you find the break, corruption, etc., that needs fixing.

The six words in the block header are followed by a table of seventy-two entries, just as in the directory block. In File Header Blocks, these slots are filled with the numbers of sectors in which the data is stored. The order is a bit unusual. Slot 77 holds the number of the first sector in the file, slot 76 the second, etc. By looking through this table, you will know exactly where your file is stored on the disk.

Following the list of data blocks, you will find that, just as in the directory block, words 78-127 hold information about this file, as follows:

- Word #78-79** – not currently used
- Word #80** – holds the protection bits, rwd
- Word #81** – the total size of the file in bytes
- Word #82-100** – hold the file comment, or filenote
- Word #101-103** – Date and time when the file was created
- Word #104-123** – File name
- Word #124** – Sector where the next file on this hash chain begins
- Word #125** – Back pointer to the parent directory
- Word #126** – Pointer to the first extension block. If zero, all the blocks are listed in this sector. If not, this is where the next group is listed
- Word #127** – Secondary file type, \$FFFFFFFFD, or -3

If a file were very long, it would have to be terribly important to merit one going through it sector by sector, but it can be done if you have a bit of understanding about the way the files are constructed on the disk. Almost all disk editors will automatically move from one block of a file to the next with a single keystroke, making this less onerous a chore than it first appears.

FILE LIST BLOCK

These are called "Extension" blocks in many other places. If the file requires more than 72 sectors, there will have to be a File List Block, of an Extension Block, to hold the overflow. Each sector used in the file must be listed in one of these blocks. They begin like all other sectors; the first six fields are filled with information about this sector:

- Word #1** – File Type \$10, or 16
- Word #2** – Number of this sector
- Word #3** – Number of data blocks listed in this sector
- Word #4** – First data block number
- Word #5** – Checksum

Just as in the other files, this is followed by a table in which the next seventy-two sector numbers is stored. Should this still be too few blocks, there will be yet another extension file to store the next seventy-two, etc.

On these extension, words 78-123 are not currently used. The last four words are very much like those of the others:

- Word #124** – next in the hash chain, but always zero because this is not on the hash chain
- Word #125** – back pointer to the File Header Block for this file
- Word #126** – pointer to the next extension block, if any
- Word #127** – secondary type, which should be \$FFFFFFFFD, or -3

DATA BLOCKS

The other documented type of block is the data block. It is here that all actual data is stored. All of the others are used for locating the data. The first six words here contain the information about the sector itself, and the remainder of the

TO THE RESCUE!

Editing Floppy Disks - Part 3

block, 488 bytes, is filled with data. The six words in the header are:

Word #0 - File type - for data block, 8
Word #1 - Number of the header block for this file

Word #2 - Sequence number - position of this block in the file

Word #3 - Data size - how many bytes of this block are filled

Word #4 - Next Data - number of the sector in which the file continues

Word #5 - Checksum

The remainder of the file is all data. Should there be a need to change the data, a good editor will let you type over the bad characters with plain ASCII, and will then save it for you, correcting the checksum as it saves. Word #2 tells you how far into the file this block is, and Word #4 tells you which sector to read after this one. If you come to the end of

the file and find that it is not really supposed to be the end, you can go back to the file header blocks and the extension blocks to see if you can pick up the missing part. Once located, the next block of the file can be connected to this one by editing Word #4 so that it points to sector in which the file continues.

Almost anything on a disk can be salvaged, by one method or another. By all means, try DiskSalv first if you need to recover a disk. But if that should fail, it is very good to have another method. This one is not easy. There is constant danger of a careless error causing even more damage. Everyone should have at least one good editor, however, and know how to use it. One of these days, that accounts receivable disk is going to be

ruined, and no procedure will be considered too drastic or too difficult on that day.

If you should find it necessary to edit a file by hand, it must be done with considerable knowledge of the block contents. We have a variety of good disk editors among the public domain /shareware offerings. Sectorama is quite popular, and works well on hard disks as well as on floppies, but it uses an interlaced screen, which some people find hard to read. Many prefer DiskX (which requires that you use ARP1.1), Smart Disk, or Blockbuster. All work well if you know what you want to do. Anyone who knows much about disks will certainly do the work on a copy of the bad disk!

B.C.

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DPT Print

John Walker continues the third part of our series with tips on how to get the best in printing

However good your document looks on the screen, its real-life appearance will depend on the quality of your printer. Let's consider the six ways in which you can produce a printed version of your publication, mostly using variations on laser and dot-matrix technology.

Your choice is between:

● **LASER PRINTERS** that are PostScript-compatible. These output high quality text and graphics, thanks to their resolution of 300 dots per inch. They are the most flexible of all printers. But they are also for the very rich, costing at least £3,500.

You can hire one at around £570 a month - with the snag being that the minimum hire period is likely three months. Laser printers are getting

cheaper; in the last two years their price has halved and their speed doubled. And other alternatives are opening up.

A sign of the times is Birmingham's Graphic Point, a High Street publishing centre complete with typesetters, scanners and DTP equipment. In Orpington in Kent, The U-Type, We Print Centre offers laser printing or typesetting facilities. Such centres are beginning to appear elsewhere. Prices vary, but you can expect to pay at least £15 an hour for computer time plus printing costs.

There are also bureaux that will take your document and produce a laser printed result. The cost is around £1 a laser-printed page. The problem is that, so far, these bureaux

do not support the Amiga (shame!), but instead use IBM PCs or Macintoshes. The solution to this little difficulty is to save the PostScript file to disk and then transfer it to IBM or Macintosh format. Since a PostScript file is in standard ASCII format, that is not too difficult.

If you have an Amiga 2000 with a PC bridgeboard, or an A500 with Transformer, Commodore's slow software PC emulator, or the A1000's sidecar, then the transfer is straightforward.

An alternative way is to use Central Software's Dos-2-Dos program which can be used with the Amiga to convert files to and from the PC's MS-DOS format. Another way is to send the file to the bureau's computer using a modern and suitable terminal software.

PostScript-compatible lasers, which commonly have a two or three megabyte memory, can produce results which can look just like conventional typesetting. You need a magnifying glass to tell the difference. They usually come with a selection of different typefaces, which can be scaled to any size between 1 and 127 points, and manipulated in various ways.

● **LASER PRINTERS**, such as the HP LaserJet, or one of its many compatibles, are cheaper and are becoming ever more affordable, although they are still expensive. The cheapest machines are around £1,795, with the LaserJet Plus II selling for £2,249. They will either produce a screendump, in the same way as a dot-matrix printer, or use built-in formats so that they can produce near-typeset printing with a resolution of 300 dpi. Such laser printers tend to have a 512K memory fitted as standard, which is not enough to print a page that contains graphics which occupy more than quarter of a page. They are often supplied with only one font, the typewriter-like Courier.

● **DAISYWHEEL PRINTERS**, which resemble electronic typewriters, can be used with cut and paste methods to produce galleys of good quality print. The result can look most effective, especially when reduced

W_HO's G^OT a g_oo_d F_Ac_E?

Times Roman has become the most used serif font in DTP
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Topaz is a sort of serif font: ABCDEFG
 abcdefghijklmnopqrstuvwxyz

New Century Bookman is an alternative serif font
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Ruby is a serif font: ABCDEFGHIJKL
 abcdefghijklmnopqrstuvwxyz

Helvetica is the most used sans serif font in DTP
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Diamond is a sans serif font: ABCDEFGHIJ
 abcdefghijklmnopqrstuvwxyz

Avant Garde is an alternative sans serif font
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz

Opal is a sans serif font: ABCDEFGHIJKL
 abcdefghijklmnopqrstuvwxyz

A comparison of laser printer PostScript fonts and the Amiga's bit-mapped equivalents, which have unconventional shapes.

continued on page 94

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DPT Print

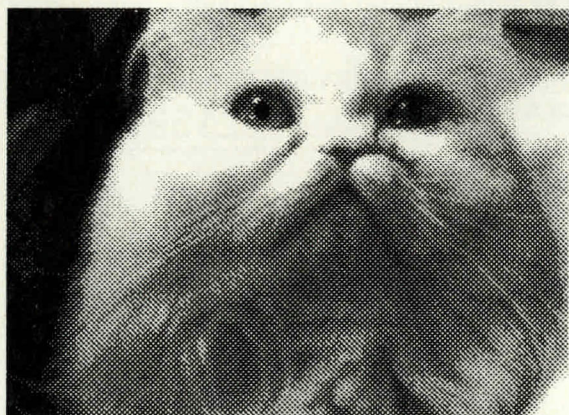
in size. But they cannot print graphics.

●**DOT-MATRIX PRINTERS** can print both text and graphics. The new 24-pin printers can achieve better results than the older 9-pin models, but printer drivers for 24-pin machines may still be hard to find.

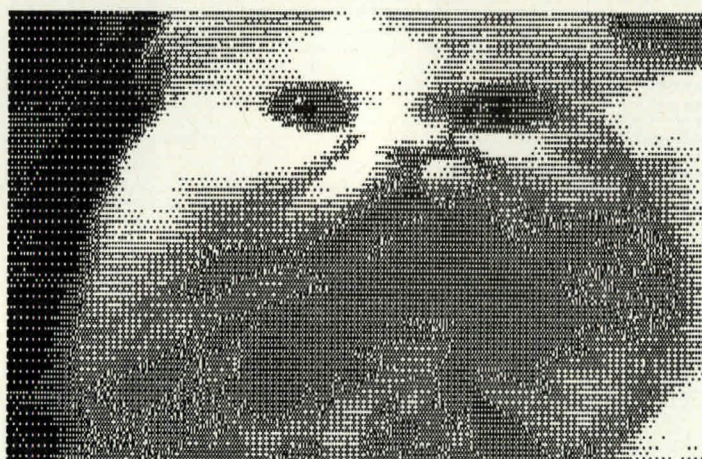
screen allow you to set seven different densities of print, although the number available to you will depend on what printer you use, and to use anti-aliasing to smooth away the worst of the jaggies. The new drivers are also much faster than the old and support more printers, including Epson-compatible 24 pin dot-matrix

Half-tone, which simulates the dotty approach to reproducing graphics used by newspapers, and Floyd-Steinberg, which is more random and works well on digitised photographs of people. New options for colour printing improve the dithering patterns, but reduce the number of colours available to you. The results provide a truer colour reproduction than the 1.2 drivers.

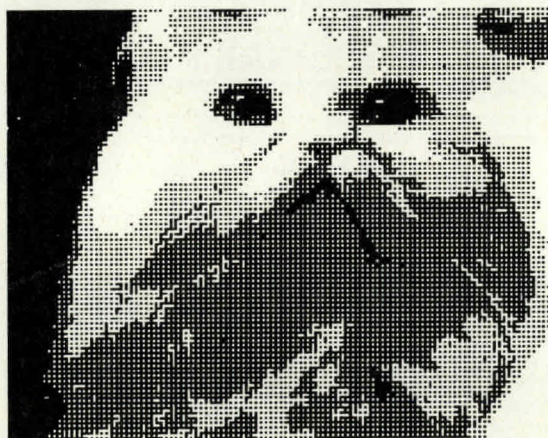
●**THERMAL PRINTERS** resemble dot-matrix in many respects, except that instead of using printheads that strike a ribbon with a series of pins,



Halftone printed from Professional Page



Printed from PageSetter 1.0



As reproduced in Prowrite 2.0



Image printed from Publisher 1000

Dot-matrix printing of text and graphics suffers from *jaggies* - those stepped edges, found on circles and larger typefaces. The resolution of 9-pin printers is low - 72 dots per inch - and cannot do justice to digitised photographs. The quality of dot-matrix is likely to improve when the new Amiga printer drivers, to be found in the 1.3 Preferences, become available to all.

You will find that you can control the print in many more ways, using a series of options that take up two screens. The choices on the second

machines and most colour printers.

You are likely to get the best results by selecting Single rather than Fanfold as the paper type on the first screen. This advances the paper by a smaller amount so that the dots overlap when printed vertically, thus getting rid of the thin white lines that sometimes appear when the 1.2 drivers are used.

The 1.3 Preferences also let you choose between three types of grey-scale shading when printing graphics: Ordered, which is the method used on 1.2 drivers,

they use heated pins that melt the ribbon on the paper. This technique works best on reproducing colour graphics, but is less effective on text.

●**INK JET PRINTERS** are also a variation on dot-matrix technology, spraying dots of quick-drying ink on to the paper through a series of nozzles. Ink jets are improving in quality, but tend to be less reliable than dot-matrix printers and are more expensive.

They score over other types of machines for colour printing, pro-

continued on page 96

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Dear Amiga User,

We would like to give you the latest news on our line of products including some exciting new ones, but before that just to remind you about the existing line.

1.5 meg internal Spirit expansions. £150 for the A500 and £375 fully populated; and £175 for the A1000 or £399 fully populated. Faster PAL chips (A1000) £19.95. Faster 68000 8 mhz £19.95 or 10 mhz £25. 512K of DRAMS £85. A500 512K boards with clock and populated £110. The new A500 2 meg internal board uses 1 meg chips and is £199 for OK. Send a disk with an S.A.E. for the Spirit demo.

We can now get the 8520 interface chips POA. 64K centronics printer buffers £64 with power supply. Screen filters to cut the glare and help reduce the flicker to enhance the image £35. 1.3 Enhancer kits available with 1.3 rom 1.3 Workbench, extras and manual. POA.

Postage on the above is £3 for the boards and £2 the remainder. Access and Visa welcomed.

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Now the really good news. A500/A1000 owners will not now need to buy an A2000/A2500 when we release our 2000 clone expansion box. With its own power supply, four slots for 2000 cards and three slots for AT cards, one for XT cards and room for a 5.25 floppy, full Zorobus spec and autoconfiguring, ability to use CBM's bridge card and only £399!!! Expect release date before the CBM Show.

You will also be able to slot onto it our new 68030 (no misprint) with 2 meg ram and running at speeds of 32 mhz with the ability to turn down the speed for full software compatibility and at under £1,000. To be released soon.

A brand new software package called VIDEO EFFECT 3D is to be released by us very soon. All the others rolled into one and more, best describe it. Demo disk available, send your disk and an S.A.E.

More new goodies on the horizon and these will be shown at the Commodore Show in June. Come and see us there or send an S.A.E. with two disks for both demos. A1000 owners are safe with our support.

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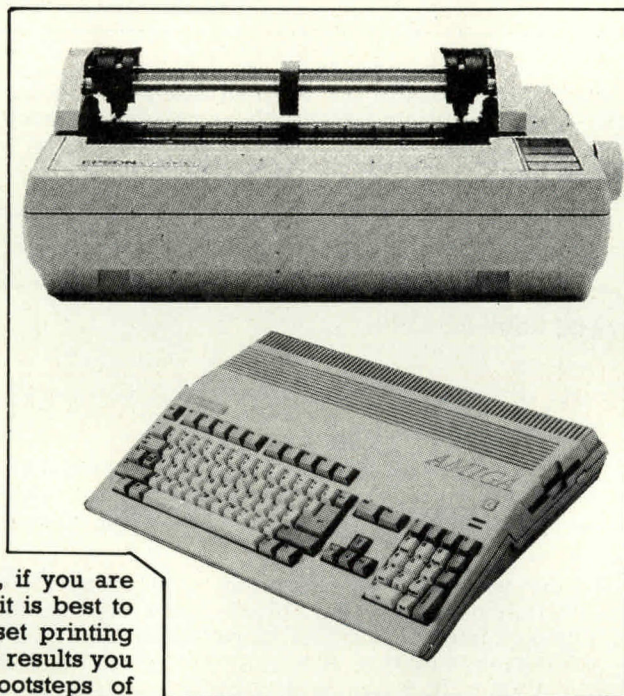
ducing the best results so far available. But a good ink jet will cost nearly £1,000. Once you have produced a satisfactory print of your publication, you still haven't finished. You have, in effect, a master copy. The next step is to produce multiple copies. How should you do it? If you have used cut and paste methods to produce the master copy, then you're restricted to two choices. You can either photocopy your master. Or you can take it to a printer to print it conventionally, using offset lithography. In this instance the printer will photograph your original to produce a copy on film, make a printing plate from the negative and then print from that.

Script looks handwritten
Fast is cursive
 Chelt is a serif font - just about
 Euro is a sans serif font

Examples of Zuma fonts which can be used for headlines.

Apple font ABCDEFGHIJ
 abcdefghijklmnopqrstuvwxyz
 Tintagel font: ABCDEFGH abcdefghijklmn
 Vancouver font
 London - a blackletter font

A few examples of the many EarthBound fonts.



Photocopying is an economical approach on short runs of under 100 copies. On publications produced on a dot-matrix printer it can produce a better-looking result, giving you a greater density of print. But photo-copiers are not always good at reproducing graphics.

If you have used DTP software and a printer to produce a master copy, then you have the additional option of printing your copies by the same method. It is only worth doing this if you need few copies. Dot-matrix printers are slow when doing a screen dump and will take around 5 minutes to print every copy of a page from a DTP program.

A laser printer is much faster, although it is slow to begin with. It may take ten minutes or even longer to produce the first copy of a page containing complex graphics. But after the first one is printed, a laser will roll out further copies every six

seconds or so. Even so, if you are printing a lot of copies it is best to revert to traditional offset printing methods. To get the best results you can hitchhike in the footsteps of Douglas Adams and print it using a PostScript-compatible Linotronic typesetter. You can also get excellent results by creating your master-copy on a laser printer, which forms the camera ready for conventional printing by offset lithography.

Professional printers can either produce a typeset publication from a word-processed document containing embedded codes or by means of a PostScript-compatible image-setters. Such methods will give the best results, but at the highest cost.

There is a dazzling future for high quality desktop printing. PostScript-compatible colour printers, using a thermal transfer system, have just become available, for those with

around £20,000 to burn. And two other trends are important. The good news is that ordinary laser printers will drop in price to below £1,000. I expect this price barrier to be broken by the end of the year.

At the same time the quality of the laser printing will improve. Just available is a laser printer providing a resolution of 600 dpi, which is four times that of other printers. It will set you back a cool £15,750 at the moment. But that, too, will one day be affordable - although by that time we shall probably all be using new Amiga 5000s to produce our own daily newspapers!

J.W.

WILL THE REAL 'AUI READERS' (IS IT YOU UNCLE JACK?) PLEASE STAND UP!

Ok, Uncle Jack, we know it's you

AUI readers are truly amazing. Every month we receive hundreds of letters congratulating, complaining, and cajoling the editorial staff. Some of you have even noticed a particularly sinister American slant to the articles ('We will not waste this precious editorial space commenting on our colonial cousins!' - Ed.) ... BUT the real question is: do you actually read AUI cover-to-cover every month?!? *Wanna prove it?*

Two winners of this month's competition will win 1/2 Meg expansions for an A500 donated by Bytes & Pieces, and 10 runner-ups will receive annual subscriptions to AUI. Now, if you were a TRUE AUI reader, you would recall instantly where the following statements were located:

1. *'The oriental sunset ripples in the distance while all kinds of creatures crawl around the rest of the screen.'*
2. *'The program will start by prompting you to insert the disk to be corrected, then follow the on-screen instructions.'*
3. *'Surprisingly, area filling is very, very, slow.'*
4. *'If a program or routine does not run as expected then try to identify the area in the source code that may be causing the problems.'*
5. *'Try it, even buy it, but if you hate it, do not say I did not warn you.'*
6. *'Your ship uses a combination of rotate and thrust controls for movement, and a forward-firing cannon for blowing away the space debris.'*

There you have it - statements made by the AUI editorial staff, contributors, (even our pet advertising copywriters) and whoever else happens to be in the office during press night. Put the correct page number and name of the article for each statement on a postcard, and send it by June 15 to:

'YOU BET I READ AUI' Competition

c/o Amiga User International Magazine, 40 Bowling Green Lane, London EC1R ONE

We will select the winners at random from the first eleven correct entries received (and we promise not to misplace the answers!).

HEAR YE! HEAR YE! HEAR YE! **The FUTURE has arrived!**

Back in the days of old, when the computer perched on the end of your desk occupied several rooms, and when people actually bought computers without digital to analogue converters (you can believe it? How archaic!) ... stereo sampling for the masses was virtually 'unheard' of. Thanks to Applied Visions, creators of FutureSound 500 and sponsors of this month's competition, all that has changed. We are giving away no less than 5 FutureSound 500 stereo samplers to lucky AUI readers and the next 20 correct entries pulled out of the winning hat will be able to buy a FutureSound 500 sampler for £20 off! All you have to do is answer the following questions:

1. *What is a 'snap shot' in Amiga sound terms?*
2. *How do you adjust the level of incoming sounds on the FutureSound 500 module?*
3. *How many RCA phono sockets does the FutureSound 500 sampler have?*
4. *Name the two ways in which sounds can be stored.*
5. *What is the price of FutureSound 500 and where is it manufactured?*

You can find the answers to this competition elsewhere in this issue of AUI. Quick now - everyone is racing to those pages this minute and finding the correct answers. This very second they are writing the answers on a postcard and mailing them to:

FutureSound 500 Competition

c/o Amiga User International, 40 Bowling Green Lane, London EC1R ONE

HURRY! *The winner will be drawn from all correct replies received by June 15.*

Amiga Answers

Yuri Large tracks down the tips that keep you on top!

Dear AUI,

Please excuse my lack of knowledge about the Amiga but having only received my Amiga this Christmas, and only having limited time to experiment on it because of school, I am still stuck.

Please can you tell me where to find "Disk Doctor". I have heard it is on Workbench 1.2 but I can't find it on there.

Could you also recommend a Virus Killer as I have (or rather my Amiga has) been infected and I need one to clear some of my disks up. Keep up the good work. I think AUI is the best mag around.

Thanking you in advance,
Richard Wykes, Berkshire.

Dear Richard,

The *DiskDoctor* is a small program that is used to try and rescue data from a corrupt disk. It can only be run from the CLI, and therefore does not have an icon. *DiskDoctor* can be found in the "c" directory of your workbench disk, along with all the other CLI commands. To invoke it, just open a CLI window and type "DiskDoctor df0:". The program will start by prompting you to insert the disk to be corrected, then follow the on-screen instructions. Don't expect miracles, and make sure that you copy your data to a fresh disk before reformatting the faulty disk.

There are a wide variety of virus killers in the public domain. The one that I would recommend is called *VirusX* by Steve Tibbett, which can be found on Fish disk 158.

Dear AUI,

I have recently purchased an Amiga 500 and I am extremely happy with it, except for one problem - the modulator.

The modulator has a tendency to stick out too much. I was wondering if there are any leads available for it so that it could be kept near the side of the computer. If there is one, is it a parallel or serial lead, where can I get one and at what price?

Thank you.
Yours faithfully,
Raymond Ramdass, London.

Dear Raymond,

There is such a thing as a modulator extension lead. It is available from Trilogic in Bradford (telephone number 0274-691115). However, it is not the same as either a parallel or serial lead, neither of which will work.

Dear AUI,

When I purchased my Amiga 500 plus all the bits I told the company concerned I wanted it just for graphics and titles for my home video. They advised me that the software I would need would be Photon Paint and Deluxe Photolab plus Deluxe Video for animation. I find it impossible to animate using Deluxe Video. Can you suggest an alternative for use with the above software.

Yours faithfully,
Ken Sparkes, Middlesex.

Dear Ken,

Unfortunately none of the programs you have bought are particularly good for animation if at all. *Deluxe Photolab* and *Photon Paint* are painting packages with no ability to animate, and *Deluxe Video* only has a limited ability to animate objects.

For proper animation facilities I would suggest either *Fantavision* or *MovieSetter*. The former, *Fantavision* is not only reasonably priced but is also very quick and easy to use. Used in the correct manner it can produce some excellent results. *MovieSetter* is a more professionally biased program, which has a greater ability to manipulate IFF images imported from other programs. If possible, as usual, I would recommend that you try before you buy!

Dear AUI,

I would be pleased if you could assist with the enquiries that follow. I use an Amiga 500 with 1 Mb of memory.

I have tried creating the Bobs and Sprites in the Basic Object Editor on the 1.2 Extras disk. I have done this and saved as shown in the Amiga Basic manual. However, when I try to call up the saved Bobs and Sprites to run programs (such as "Ball" shown on pages 91 and 92 of the Amiga Basic manual) I get a "File not found message". I've tried using inverted commas, capitals and lower case but cannot get the item created in Object Editor to come into use.

I use the example shown on page 92 of the Amiga Basic manual. Any suggestions?

Also, any details would be appreciated on the use of the Speak Handler on

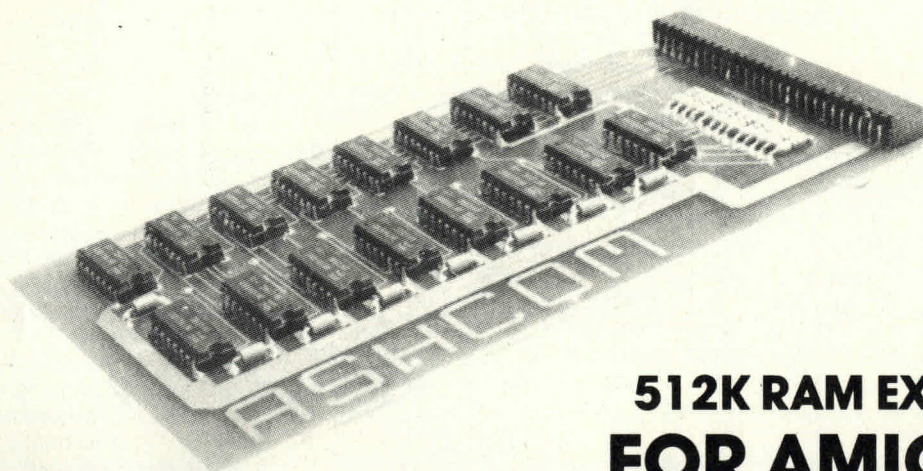


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1.3 Workbench. The Workbench 1.3 manual on pages 3-7 and 3-8 shows how to mount speak to read the WB startup sequence. When entered in CLI this indeed speaks, but not in the female voice it says it should have.

I wonder if you are able to tell me how to enter the Speak Handler details:

```
Speak: Handler = L:Speak-Handler
Stacksize = 400
Priority = 5
Globvec = -1
#
```

as shown on page 3-7. Is this whole description supposed to be entered in shell or CLI? It cannot be entered as returning after each line executes it, yet the manual says the "#" sign should be on the last line. However, all I get is an "unknown command" error after I try to enter each line.

Any help on this and how to save Speak as a filename in order to get spoken output from word processors would be greatly appreciated. I use Scribble, Word-Perfect and Write & File - is the Speak saved as part of the file, e.g. Document 1:Speak?

Your assistance would be very much appreciated.

Yours,
Alex McQueen, Edinburgh.

Dear Alex,

When referring to a file to be used by an AmigaBASIC program you must either specify the full path e.g. Extras: Basic Demos/Ball, or you must use the "CHANGEDIR" command to make the current directory the one in which the file you are using is situated e.g. CHANGEDIR Extras:BasicDemos. If you do not, you will get the "File Not Found" error; don't forget that AmigaBASIC cannot look beyond it's current directory without guidance!

The "SPEAK:" device is a new edition to Amiga Dos version 1.3, which is now (finally) in the shops. It can be used in the same way as a disk drive or the ram disk, apart from the fact that any file sent there is translated and spoken immediately by the Amiga rather than being stored. You can use it when saving a file from a word processor or copying a file using the CLI. The output from either operation will be spoken by the Amiga. For instance, when using Scribble!, specify the directory as "SPEAK:" and the filename as "Anything", then click on "Store" et voila, your Amiga speaks the document you are currently working on. Using the options provided you can alter the voice to your own taste. In fact, the female option does work. However, to hear it properly you also need to increase the value used for the pitch of the voice. There is very little difference between the male and female voice at the same pitch!

The entry for "SPEAK:", that you mention, has already been entered. It is not an

entry from the CLI, but it is an entry in the "mountlist". The "mountlist" is a text file listing all the available devices with their parameters, and is situated in the "devs" directory on the Workbench. These entries can be mounted using the CLI "Mount" command. In the "SPEAK:" device's case the command would be "Mount SPEAK:". However, on Workbench 1.3 the "SPEAK:" device is automatically mounted in the startup-sequence, so that it is ready for use immediately.

For those of you who have not already invested in the Amiga DOS 1.3 Enhancer Pack, "SPEAK:" is one of the many enhancements included. You can buy the pack from your local Commodore dealer for just £14.95, and it's well worth every penny!

Dear AUI,

I've been reading your magazine for quite a while and I was wondering if you could help me.

I am an Amiga 500 owner and I would like to know if there is an expansion board which could make the Amiga 500 IBM compatible. If so, are there any 5.25" disk drives for the Amiga 500?

Please help, I'm desperate!!
Yours faithfully,
J. Fairley, Bemmell, Holland.

Dear Mr. Fairley,

There is not a hardware based IBM emulator available for the Amiga 500 at present. However, there is a software emulator which is called the Transformer. This only works with text based IBM applications, which it will run at about a quarter of the speed of a standard XT. It costs approximately £40 from good Amiga stockists.

Cumana produce a 40/80 track switchable drive, which is suitable for use with the Transformer. This drive comes complete with MSDOS driver software to allow use of standard 360K PC disks with the emulator for approximately £150.

Dear AUI,

My wife bought me Write & File for a present whilst on leave in the UK from a distributor somewhere in the Newcastle area.

I don't know what the opinion is of this program in the UK, but mine is of bewilderment that a program like this is available to the general public. Is there any advice you can offer on what can be done? I have written to the manufacturer "Softwood" in America but have received no reply as yet. My problems with the program are too numerous to mention.

Secondly, is it possible when loading a disk with forty or more files to speed up the loading by using sub-directories.

Yours faithfully,
Terence J. Evans, Cairo, Egypt.

Dear Terence,

There is very little that you can do about software that you find unsatisfactory. Your only course of action is to write to the manufacturer as you have already done. I have dealt with Softwood myself previously and I believe them to be very helpful. One thing I would advise with "Write & File" is that it works better with large amounts of memory.

You can speed up the reading of directories by putting files into sub-directories. It is similar to filing lots of loose sheets of paper; it takes less time to find the sheet of paper you want because you know which file to look in!

Dear AUI,

I own an A500 and around a year ago purchased a copy of Flight Simulator II. However, occasionally the program crashes, leaving a confused screen making it necessary to re-boot the program. Despite obtaining a new copy of the program, the program still crashes. I wonder if it could be a bug in the program or indeed something wrong with the computer. The program is version 1.1. I hope you will be able to throw some light on the problem.

Is there a program that can test the circuits on the A500?

Yours faithfully,
J. Connors, Essex.

Dear Mr. Connors,

There is a bug in Flight Simulator II as you describe. Sub-Logic say that this bug does not arise when the program is run on American NTSC machines, and have just purchased a European PAL machine to try and solve this bug. As far as I know they have not released an amended version for Europe yet. I will keep you posted!

Unfortunately I do not know of any diagnostic programs available for the A500 as yet.

Dear AUI,

While I was messing about with CLI I came across a weird phenomenon. AmigaDOS opens up the Console device which allows ESC sequences to be sent to it. So it is possible to have italics, bold and inversed video on the CLI. To do this the "1;" has to be displayed and then all you do is type the ESC sequence for the required text. Also CTRL sequences are possible from the CLI.

CTRL-I Tabs and spaces

CTRL-G DisplayAlert (Flash the screen)

CTRL-K Vertical Tab (Move cursor up a line)

CTRL-L Clears the screen

CTRL-N Display the following text in NON-ASCII characters

CTRL-M Does the same as the RETURN key

The following are ESC sequences which can be sent by the CLI. All of the sequence must be typed, i.e. press the

AMIGA ANSWERS

ESC key first then the "I" and then the number and the letter "m".

ESC [0m Normal Text (Reset to normal to character display)

ESC [1m Boldface text

ESC [2m Change colour of text

ESC [3m Italics text

ESC [4m Underline text

ESC [7m Inverse video

ESC [8m Locks the keyboard

ESC [30m Makes the cursor the same colour as the background colour

The following change background, foreground and cursor colours depending on colour settings in Preferences. The list shows the colour changes for my own Preferences. As your colours may be different, the effects will not always be the same.

ESC [33m Blue cursor

ESC [34m Disappear

ESC [35m White cursor

ESC [36m Black cursor

ESC [37m Blue cursor

ESC [39m White cursor

ESC [42m Black background

ESC [43m Light blue background

ESC [44m Black background and white text

ESC [45m White inverse video

ESC [46m Black background

ESC [47m Blue background and blue cursor

I would suggest that people experiment with these ESC sequences. As I said

before, the best way to find out is to try them on your machine. I hope this will help somebody out there! These commands could also be used with the Prompt command, but I am not sure how! One more point, I think this magazine is brilliant. I'm saying that just to make sure this letter gets printed! (Just kidding.)

Christopher Collett, Birmingham.

Dear Christopher,

Thanks for the information. The above control and escape codes can be used with any CLI commands which use a text string as an argument. To use the control codes just enter them as usual. To use the escape codes replace the escape key by "E". Try these examples:

Prompt "E[45m*E[36mHello! *E[0m"

Echo "E[1m*E[2mHello again!*E[0m"

With experimentation you can produce some very flashy looking script files for us with the CLI "execute" command.

Dear AUI,

I have just purchased an Amiga A500 V1.3. Since then I have purchased many Amiga titles. However, I was not warned by Dixons that certain titles do not work on the new V1.3.

I tried returning titles that did not load to the shops I bought them from and have been turned away with no joy. Please, when you review games, let V1.3 owners

know whether these titles work and warn your readers.

Yours hopefully,
James E. Flowers, London.

Dear James,

The advent of V1.3 has meant that the programmers who have not stuck to Commodore's rules have been discovered. In most cases it is games rather than applications software that "guru out!". The reason for this is that the Amiga's powerful built in functions are situated in massive libraries in the ROM chip and to find any of these functions the programmer is supposed to look through a list to find the address of the function he or she wants to use and then jump to that address. However, in the interests of speed many games programmers don't bother to look through the lists, and just jump to the position that they expect to find the function in. In V1.3 the positions of some functions within the libraries has changed, thus when one of the naughty programs jumps to the position it expects to find a particular function and doesn't find it, a guru results. This is all too familiar to current V1.3 A500 owners.

I hope all reviewers of games listen to your plea James, or better than that maybe the games programmers themselves will get the hint!

AMIGA	ELIMINATOR		CAPTAIN BLOOD		VIXEN		TEENAGE QUEEN		CHAMP AMERICAN FOOTBALL		DEFENDER OF THE CROWN		NIGEL MANSELL'S GRAND PRIX		SKYCHASE		THREE STOOGES		XENON	
	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP
BAAL	39.94	19.96	44.90	20.96	39.94	17.46	39.90	20.96	44.94	18.96	49.90	20.92	44.90	17.46	39.94	19.96	49.94	21.96	39.94	20.96
BALANCE OF POWER 1990	44.98	22.98	49.94	23.98	44.98	20.48	44.94	23.98	49.98	21.98	54.94	23.94	49.94	20.48	44.98	22.98	54.98	24.98	44.98	23.98
BATMAN	44.94	22.46	49.90	23.46	44.94	19.96	44.90	23.46	49.94	21.46	54.90	23.42	49.90	19.96	44.94	22.46	54.94	24.46	44.94	23.46
BATTLECHESS	44.94	23.96	49.90	24.96	44.94	21.46	44.90	24.96	49.94	22.96	54.90	24.92	49.90	21.46	44.94	23.96	54.94	25.96	44.94	24.96
CRAZY CARS 2	44.98	21.48	49.94	22.48	44.98	18.98	44.94	22.48	49.98	20.48	54.94	22.44	49.94	18.98	44.98	21.48	54.98	23.48	44.98	22.48
DENARIS	39.98	20.98	44.94	21.98	39.98	18.48	39.94	21.98	44.98	19.98	49.94	21.94	44.94	18.48	39.98	20.98	49.98	22.98	39.98	21.98
DRAGONNINJA	44.94	22.46	49.90	23.46	44.94	19.96	44.90	23.46	49.94	21.46	54.90	23.42	49.90	19.96	44.94	22.46	54.94	24.46	44.94	23.46
DRAGON'S LAIR (1 MEG)	64.94	33.96	69.90	34.96	64.94	31.46	64.90	34.96	69.94	32.96	74.90	34.92	69.90	31.46	64.94	33.96	74.94	35.96	64.94	34.96
DUNGEON MASTER (1 MEG)	44.98	22.48	49.94	23.48	44.98	19.98	44.94	23.48	49.98	21.48	54.94	23.44	49.94	19.98	44.98	22.48	54.98	24.48	44.98	23.48
ELITE	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
F16 FALCON	49.98	23.98	54.94	24.98	49.98	21.48	49.94	24.98	54.98	22.98	59.94	24.94	54.94	23.48	49.98	23.98	59.98	25.98	49.98	24.98
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FISH!	49.94	22.46	49.90	23.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
GALDREGON'S DOMAIN	39.94	18.96	44.90	19.96	39.94	16.46	39.90	19.96	44.94	17.96	49.90	19.92	44.90	16.46	39.94	18.96	49.94	20.96	39.94	19.96
HEROES OF THE LANCE	44.98	23.98	49.94	24.98	44.98	21.48	44.94	24.98	49.98	22.98	54.94	24.94	49.94	21.48	44.98	23.98	54.98	25.98	44.98	24.98
HSTAGES	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
HYBRIS	44.94	22.96	49.90	23.96	44.94	20.46	44.90	23.96	49.94	21.96	54.90	23.92	49.90	20.46	44.94	22.96	54.94	24.96	44.94	23.96
KRISTAL	49.98	23.98	54.94	24.98	49.98	21.48	49.94	24.98	54.98	22.98	59.94	24.94	54.94	21.48	49.98	23.98	59.98	25.98	49.98	24.98
LEMBARD RAC RALLY	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
MENACE	39.94	19.96	44.90	20.96	39.94	17.46	39.90	20.96	44.94	18.96	49.90	20.92	44.90	17.46	39.94	19.96	49.94	21.96	39.94	20.96
OPERATION NEPTUNE	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
PACMANIA	39.94	18.96	44.90	19.96	39.94	16.46	39.90	19.96	44.94	17.96	49.90	19.92	44.90	16.46	39.94	18.96	49.94	20.96	39.94	19.96
POWERDROME	44.94	23.96	49.90	24.96	44.94	21.46	44.90	24.96	49.94	22.96	54.90	24.92	49.90	21.46	44.94	23.96	54.94	25.96	44.94	24.96
PURPLE SATURN DAY	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
ROBOCOP	44.94	22.46	49.90	23.46	44.94	19.96	44.90	23.46	49.94	21.46	54.90	23.42	49.90	19.96	44.94	22.46	54.94	24.46	44.94	23.46
ROCKET RANGER	49.98	24.98	54.94	25.98	49.98	22.48	49.94	25.98	54.98	23.98	59.94	25.94	54.94	22.48	49.98	24.98	59.98	26.98	49.98	25.98
SARGON 3 CHESS	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
SPEEDBALL	44.98	22.48	49.94	23.48	44.98	19.98	44.94	23.48	49.98	21.48	54.94	23.44	49.94	19.98	44.98	22.48	54.98	24.48	44.98	23.48
STARGLIDER 2	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
SWORD OF SODAN	44.98	21.98	49.94	22.98	44.98	19.48	44.94	22.98	49.98	20.98	54.94	22.94	49.94	19.48	44.98	21.98	54.98	23.98	44.98	22.98
TV SPORTS FOOTBALL	49.98	23.98	54.94	24.98	49.98	21.48	49.94	24.98	54.98	22.98	59.94	24.94	54.94	21.48	49.98	23.98	59.98	25.98	49.98	24.98
UNIVERSAL MIL. SIMULATOR	44.94	21.46	49.90	22.46	44.94	18.96	44.90	22.46	49.94	20.46	54.90	22.42	49.90	18.96	44.94	21.46	54.94	23.46	44.94	22.46
WECLE MANS	44.94	22.96	49.90	23.96	44.94	20.46	44.90	23.96	49.94	21.96	54.90	23.92	49.90	20.46	44.94	22.96	54.94	24.96	44.94	23.96
ZAK MCKRAKEN	44.98	23.98	49.94	24.98	44.98	21.48	44.94	24.98	49.98	22.98	54.94	24.94	49.94	21.48	44.98	23.98	54.98	25.98	44.98	24.98

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COMPUNET

Stuart Williams examines an increasingly popular on line public communications service.

Compunet may seem at first glance to be yet another View-data system along the lines of Prestel/Micronet. True, they both use a system of information screens or 'pages' instead of the continuous scrolling stream of ASCII text which you will have experienced on Bulletin Boards, Email services or conferencing services such as CIX; they both also employ a system of page numbers and keywords to identify specific areas of their database. Here, though, the similarity ends.

To access Compunet, all you need is an Amiga (or C64), a modem (preferably Hayes compatible, but a cheapo 1200/75 baud manual modem can be used), and the Compunet Terminal software, written by Ariadne and distributed as Shareware as well as being available direct from Compunet. As the system was originated for use exclusively for use by Commodore 64 owners, the sophisticated and user friendly terminal software cleverly emulates the C64's forty column block graphics and colours, taking advantage of the Amiga's hi-res sixteen colour eighty column mode to implement display of the Compunet system in several windows which can be moved around in the usual Intuition fashion, but cannot be sized.

"It is also possible to capture pages from the system, edit them, and re-send them to the Compunet computer."

Instead of negotiating a way around via a seemingly endless stream of menus which need numbers keyed to move from page to page, the Compunet structure is more a system of branched directories and subdirectories, in a tree-like structure like the disk directories or 'drawers' on the Amiga. Moving through the system is merely a matter of pointing and double clicking with the mouse!

One of the windows of your terminal screen display shows the directory

structure through which the user is moving, while another shows the actual information on the 'page' of graphics and text which has been downloaded into your computer. Compunet downloads its pages into the terminal software's editor, where the information may be saved, printed or simply left to be overwritten by subsequent pages. The editor is multi-tasking, and allows the user to edit and prepare pages of graphics and text on or offline, even when downloading a program! These pages can then be transmitted to other Compunet users, or uploaded to the system. It is also possible to capture pages from the system, edit them, and re-send them to the Compunet computer!

As well as options attached to the windows themselves, the menu bar is used in time honoured fashion to allow you to check for incoming mail, set the 'life' of any file or information which you upload, check your Compunet account details, vote on what you think of items on display, or leave the system.

One final window, much smaller, appearing just after connection to Compunet, entitled 'Diagnostics', shows the progress of data transfer between the Compunet system and the Amiga; interestingly, the data stream is fully error checked, which means that you should never get a garbled page even on a noisy 'phone line! Unfortunately, this works by causing any corrupted data to be re-sent, which inevitably entails a decrease in speed.

There are many club areas, including the Amiga User Group and the Compunet Computer Club, plus a wide variety of Special Interest Groups (areas containing articles, news, comment and hints and tips as well as messages relating to specific subjects or aspects of computing or other hobbies). The great advantage of Compunet is that the system is interactive, and much of the content is written by the enthusiastic subscribers themselves. The system is much like a huge bulletin board with graphics! Users are actively encouraged to contribute, and it is even possible to set up your own area on the system at a negligible cost (45,000 page/days for £10 if you are a Gold Subscriber - a page/day is one page or one k or program stored for one day). If you are considering starting up a

bulletin board system yourself, but are shy of the necessary capital, setting up your own area on Compunet could well prove a very acceptable alternative! It is even possible to advertise your talents as a programmer by uploading a demo of your work in one of the places set aside for the purpose, for the software talent scouts to have a look at.

The international 'Newsbytes' service is available on Compunet; this is a popular service once only available on the expensive American comms service 'BIX', which can now be found on several systems worldwide, including The Source and Compulink's CIX in the UK. For those who prefer to chat instead of read, or are addicted to Multi User Games, there is Federation II, a space trading game, and Partyline, a chatline service. To use these two you have to pay a time charge of £1.50 per hour for Federation II, and £1.00 for Partyline. You can also download add-ons or 'links' to the Amiga terminal software which open up a true scrolling terminal window for these two services - much easier to get along with for this kind of activity. The scrolling window disappears when you leave Partyline or Federation II.

There are many programs to download for Amiga users, and the telesoftware system is free of charge. In addition, there are new features coming soon such as the gradual implementation of 1200 baud full duplex access as well as the current 1200/75 baud service, which should speed uploading, plus a new automatic upload indexing system (which shows programs and other items uploaded to the system every hour).

If you are an Amiga user into communications, and you are looking for a commercial service that not only contains the fun and interactive elements of bulletin boards but also has many of the advantages of commercial systems such as cheap local 'phone rates for 95% of the UK, then Compunet could be the place for you.

S.W.

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AmigaDOS

Inside and Out

Abacus

AmigaDOS is many things, advanced it is - fast and friendly it most certainly is not. So where does this leave the average user? Lost usually. In the absence of good reference material Abacus has come to the rescue once again.

For absolute beginners, I can not recommend this book - which consists of over 250 pages dedicated to AmigaDOS. Instead, obtaining a copy of excellent AmiKit (reviewed in the February 1989 issue of *Amiga User International*) would be a much better idea. I say this because like many Abacus books, this one is not really aimed at non-computer literature folk. On the whole in fact, it serves as a welcome follow on from the AmiKit literature even though the two are produced completely independently.

From the outset, the authors encourage getting the reader down to the business of sitting at a keyboard and doing, rather than simply explaining what all of the commands do and how to use them - this comes later. In so doing, the process of learning what is essentially quite a heady subject comes more naturally than could otherwise be achieved. The first job is to make a copy of the original Workbench disk, since a fairly simple mistake made while editing the startup script file could make the disk useless.

The rest of the first chapter is dedicated to getting the reader familiar with some of the more unusual features of AmigaDOS. For example, just about everyone who has used a PC will know the DIR command. This is used to obtain a directory - that is a listing of the files - on a disk. Those who have dipped slightly further will know the drives have the logical device assignments DF0: to DF3:. Few though will know almost all commands in the AmigaDOS have a built-in help feature. Simply typing the command name followed by a query thus: DIR ? Results in the command producing what is known as a command tem-

plate. In release 1.2, DIR's command template is DIR, OPT/K.

In the second chapter however, this and many other commands have - as the book explains at length - been substantially modified and added to in release 1.3. The coverage of release 1.3 of the operating system may seem a little premature since it is only just starting to appear. Even so, I have tried many of the examples given with an American version of 1.3 and as yet have spotted no obvious errors.

In fact coverage of 1.3 does serve as a useful example, and it is well worth reading this book just to see what you may be missing out. Along with the coverage of the commands, the writers have included a small section on the Diskdoctor command. This even goes as far as to list all of the possible error messages and give fuller descriptions of each one.

The next two chapters cover the devices themselves, like CON:, PAR:, SER: and so on with some useful examples, and Workbench 1.3. Here you will find an explanation of some of the new features like the recoverable RAM disk and other new devices like NewCon and Pipe.

From here on the book starts to get to grips with some of the more interesting features of AmigaDOS, what Abacus term 'tricks and tips'. At long last there is a brief but informative discussion of the correct use of wildcards. Users of older Commodore machines must be left wondering what was wrong with the old * and ? symbols. They are still there but the * symbol has been replaced by a #. To make matters worse still the # sign can search for repeating strings. All of this is explained.

Perhaps the most confusing part of AmigaDOS is the script files, MS-DOS users will know them as batch files. Seemingly to complicate matters some bright spark called the system 'startup script, Startup-sequence'. This is all well and good until you try and edit it using CLI. Essentially, a script is a

series of commands executed by CLI rather like a program. In fact it could be thought of as letting the computer type a set of commonly used commands for you. In truth of course they are more involved than that. In fact the book explains how to customise your startup for your personal requirements - and even get it to ask you questions while the machine boots.

For the real enthusiasts, the book includes a section on multitasking from both CLI and Workbench, which includes some interesting tips on how to get round the all-too-common Task Held alert. Plus some explanation of how multitasking is implemented on the Amiga and some tips on using task priority lists to speed up important operations. For example, you could set off your printer as a low priority job printing something in the background, while giving the drives a slightly higher priority and speeding disk access.

Finally the book delves deep in to the workings of the DOS itself and gives details of how to create your very own CLI commands. This section includes some listings in C, although such things should only be attempted when you are confident in your abilities as a programmer.

All in all, 'AmigaDOS Inside and Out' is not a bad read. As I have said, it is not for the raw beginner, but should satisfy a thirst for more knowledge for more advanced users. As is usual with Abacus books, the contents are well laid out - but the index is painfully short. There is a pleasant quick reference guide at the rear and a single appendix listing the escape sequences used to generate colour in CLI scripts. The real benefit of this book is its thorough coverage of the CLI in versions 1.2 and 1.3. I expect therefore, it will replace the Bantam guide as the standard reference to AmigaDOS. Recommended.

M.S.

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The joystick, the Quick Joy Supercharger, will retail for £12.95 and has a host of functions which make it a game player's dream. It will be the first product released by De Gale Marketing on an exclusive basis in the UK. Other joysticks in the Quick Joy range will be released in the near future.

The Supercharger has 8 directional control, 6 microswitches, 4 suction pads, 2 fire buttons (trigger finger and thumb) and one auto-fire button. The joystick also has a 9 pin Atari type interface, a pis-

tol grip handle and an Amstrad CPC selection button which gives the joystick the unusual asset of having an auto-fire button running for Amstrad CPC computers. The joystick is also available for all the other major computers.

Contact: De Gale Marketing Ltd., 81 Tottenham Court Road, London W1A 1EY. Tel 01-637 5735 / 01-631 1189.

Designer Database

Software Visions Inc. has introduced its Designer Database series for the Amiga. The Designer Database series is a collection of many databases and macros, organised in a ready-to-use format, designed to work with Software Visions' Microfiche Filer and Microfiche Filer Plus databa-

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