

ISSUE 3 ■ OCTOBER 1989 ■ £2.95

ST FORMAT

EXCLUSIVE
THE NEW STs
full report on page 14

COVER DISK 3

XENON 2

PLAYABLE DEMO OF MIRRORSOFT'S
MIND BLOWING SHOOT-'EM-UP PLUS
AN IN-DEPTH REVIEW ON PAGE 82



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A special investigation into what makes
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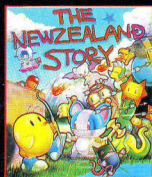
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**THE STE AND
TT ARRIVE14**



**BUILD A DRIVE
TRACKER.....35**



**THE GREAT
ADVENTURER...94**



**16-BIT SAMPLING
SENSATION.....110**



**Why violent games
are always the
best, plus the pick
of past and
present greats.**

DEATH WISH...58



**Mandelbrot and
fractal graphics
explored. Discover
how to put chaos
into your life,
and create
technicolour
marvels on your
machine in
the process.**

PLOT ON THE LANDSCAPE...20



XENON 2.....82



STRIDER.....78

GAMES

Screen Play.....	65
Eye of Horus.....	66
Slayer.....	66
Summer Games.....	69
Games Special.....	70
Passing Shot.....	72
Conflict.....	74
Rocket Ranger.....	80
Castle Warrior.....	83
N'Zealand Story.....	85
Coming Soon.....	86
Game Busters.....	92

THANKS TO MARCO COUNTRY & WESTERN STORE BATHY ANON



REGULARS

NEWS.....	7
FROM AMERICA.....	12
PUBLIC SPEAKING.....	45
THE EDUCATION GAME.....	100
TELEPHONE LINES.....	118
DESKTOP.....	116
LETTERS.....	121



**512-COLOUR RAYTRACING
MAKES IT TO THE ST.....26**

SPECIALS

MEGA 1 COMPETITION.....	32
HYPERCACHE.....	42
THAT'S WRITE.....	48
TEMPUS 2.....	53
REGENT WRITE.....	50
GFA COMPILER V3.....	54
EPROM BLOWER.....	56

COVER DISK17

Side 1

XENON 2 sensational arcade-quality shoot-'em-up in playable demo form.

SUN AND TIMES CROSSWORD pit your wits against Akrom's newspaper crosswords.

TRACKER build the DIY project on page 35 and then test that it works with this utility.

FORMAT 10 use it to back up the Cover Disk.

Side 2

FRACTAL SURF create fractal landscapes. **MAGIC EYE** a dazzling demo to go with the chaos feature on page 20.

MANDELSHOW explore the Mandelbrot set.

GFA DEMOS make music with **GFA BASIC**.

SCREEN EMULATORS mono and colour screen emulators for your monitor.



■ Shoot your way to stardom in Xenon 2.



ART AND NOISE

MANDELBROT PLOTS.....	20
GFA RAYTRACE	26
BMF SHOW REPORT	103
UK ELECTONIKA '89	104
VIRTUOSO	106
MUSIC THEORY	108
SOUND SAMPLERS.....	110

ST FORMAT ISSUE 3 OCTOBER 1989

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Digitally Yours

Cleverly written and always favourably reviewed in the press, Digita produces a range of powerful, low cost software for the home and business user.

DGCALC

The fastest and most powerful spreadsheet available in this price bracket, with 512 rows by 32 columns, giving you up to 26624 cells. As well as Digita products, the operation of the program is clearly thought-out. Being either menu, mouse or command driven you'll be able to start using it within minutes - even if you've never used a spreadsheet before. Some of the features which make it such good value are the exporting of ASCII files for integration with other programs, adjustable column width and text overflow, programmable function keys (macros), and a unique window facility, so that you can look at different parts of a sheet at the same time.

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E-TYPE

Do you ever have to print names and addresses at awkward places on envelopes, or do you ever need to fill in tricky forms or invoices where the text has to be in exactly the right place? (Usually you have to do it by hand, or get your trusty old typewriter out of the cupboard and dust it off. Well not anymore. The Emulated TYPewriter transforms your computer and printer into a fully fledged typewriter, supporting bold, underline, italic and other type-styles. Because it can display and print text INSTANTLY you can line up your form, press Return and Space a few times to move to the correct place, and then start typing. Alternatively you can switch to line-by-line mode, which offers word-wrap, justification and proportional spacing, so that you can edit each line before it's printed.

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MAILSHOT PLUS

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July 89 - PTP user receives tax refund of over £2000!

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DAY-BY-DAY

An excellent way to get organised. With it you'll be reminded of birthdays and other anniversaries, meetings and appointments, phone calls to make and so on. As well as all Digita products, inputting information is simplicity itself and, once entered, you can search for keywords or for particular events such as birthdays to see when one is coming up. Includes month-weekday planner, automatic reminders for overdue appointments, month and week summary at a glance. For less than £30 this is the ideal way to make sure you never miss that important occasion again!

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DGBASE

If you're looking for fast access to stored data, and the ability to create customised reports, including off-line/online technical notes, then DGBASE is for you. Designed and written specifically for the Atari ST, DGBASE will fully utilize the facilities of your computer and GEM. This powerful, rational database offers access to GEM. This simultaneous multi-table, multi-table access with Digita's DGCALC and Mailshot Plus, suits, makes other ASCII files. You can even change or add fields AFTER setting up your database. Simply itself, DGBASE comes on one disc which includes on-line help and limited only by the capacity of your ST and your imagination!

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Use your computer as a powerful business tool and take the drudgery out of book keeping in its simplest form. The Digita program, in effect, does much more. Typical information includes: * Summary of VAT * Typical departmental analyses of sales and purchases * Total debtors and creditors * sales and overheads * Total expenses accounts * Journal income for sterling transfers and money loan derivable * Overseas accounting procedures and money requirements, ensuring correct approach to Accounts.

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SUPER STS TO STAR AT PC SHOW

Turn to page 14 for the full details of Atari's exciting new machines.

Atari's ST-compatible machines, launched at the Atari Messe in Dusseldorf in Germany, are to be displayed at the PC Show, held from the 27th of September to the 1st of October, ST Format can reveal.

The Atari Village is to have special booths where demonstrations of the new machines will take place. The STE, at £499, is to replace the existing 1040 – and is seen by Atari as its top-end games machine. The upgraded ST offers a 4096-colour palette (however the graphics resolutions and total number of colours on screen remains the same), stereo 8-bit DMA sound chip which plays sampled music at preset frequencies, horizontal and vertical hardware scrolling, and two new game controller ports. The new game ports mean the STE can have a total of six joysticks attached at any time. Other input devices like a light gun, light pen and paddles can also be attached.

Atari has no immediate plans to launch a 512K version of the STE, but rumours suggest that a

half megabyte model might appear next year.

Meanwhile, the TT is Atari's performance machine, boasting a 68030 processor clocked at 16MHz (with room for an optional 68881 or 68882 maths co-processor), 2Mbytes of memory expandable to 8Mbytes, a 30Mbyte hard

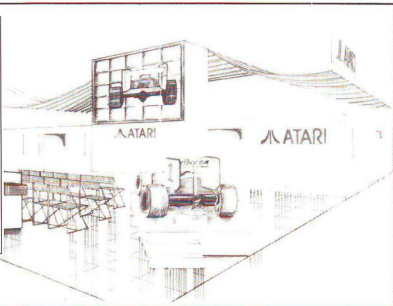
drive and a high resolution colour monitor. And all for under £2000.

In addition to the two new ST-compatible machines, Atari is expected to show the long-awaited Stacy laptop ST. While four models are planned, only two – the low end and high end versions – will be available in the UK.

For the first three days the PC Show is open only to trade and business visitors, while the remaining days it's open to everyone. Opening hours from Wednesday through to Saturday are 10am to 6.30pm and from 10am to 5pm on Sunday. The venue is Earl's Court in London.



■ Stacy as it is to appear at the PC Show. The machine offers a 68000 CPU, 1Mbyte of memory, and 640 by 400 high resolution LCD screen.



Off your trolley

One lucky ST Format reader will have the opportunity of filling a shopping trolley with software and hardware for the ST at the multi-format Computer Shopper Show in late November.

The competition is organised by Database Exhibitions, and the

winner will have five minutes to run around the exhibition placing hardware and software in a shopping trolley. And, at the end of the run, will not have to pay for anything.

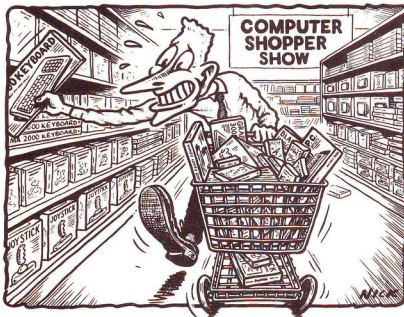
Within the Shopper Show (Alexandra Palace, November 24th to 26th) there'll be a 'Wonderful

World of Atari' arena. More than 100 of the 250 stands will be selling Atari-specific products. Companies exhibiting ST kit will include Armor, Bath Shack, Digita, Equinox, Frontier, GST, HiSoft, Kuma, Power Computing and SDL.

There will be plenty of new products to see. Armor will be unveiling its new database, Pro-Data, whose feature include multiple indexes, powerful search and comprehensive printing options. AVR/2-Bit will be demonstrating its range of new sound samplers (see page 110). B Bytes will be launching several educational packages and a file indexing system called

SuperCard. Digita hopes to have the *Multigen* genlock device and *Effective Total Control* (a suite of business application) ready. Graduate will be releasing an educational package to cover the new national curriculum. And Mandarin will have *Gamespack*, *Cartoon Capers* and *Music* to add to the STOS range.

Intense competition between the large number of exhibitors should mean the Computer Shopper Show boasting more special offers than any previous pre-Christmas show. A survey of all the current exhibitors indicates that discounts on product could total close to one million pounds.



COMPETITION RULES

The *Computer Shopper Trolley Competition* is open to all readers of *ST Format*. No rules, no questions, no sweat. Just write your name and address on the back of an envelope or postcard and send it to **ST TROLLEY COMPETITION, ST Format, 4 Queen Street, Bath, BA1 1EJ**. All entries must be in by Friday 29th September. The winner will participate in a fantastic trolley run half an hour before the exhibition opens on November the 22nd, and will be named in the next issue of *Format*. The winner is limited to one predetermined item per stand from all participating exhibitors – which may be either software or hardware. All entries must be in by Friday 29th of September. Move it!

FONTASTIC DAY Fast worker

Many ST applications rely on screen and printer fonts for display and output. Most of the packages that require fonts come with a small selection; others can usually be purchased from the software manufacturer. Because of the demand for low-cost fonts, many third-party software developers are releasing fonts of their own.

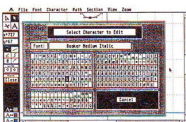
TEMS FONT

Calamus uses what are known as Compugraphic fonts – to install these into your system can cost around £100 a throw. The Atari Business Centre in Nottingham has an alternative range of high-quality fonts that don't come with the price.

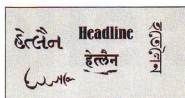
The first Compugraphic-compatible font is called *Tems* (based on *Thames*) and comes with numerous type styles: bold, italics, condensed, horizontally and vertically enlarged.

A demo disk, containing the

uppercase characters of the fonts, is available for £15. The full *Tems* font costs £45. The Atari Business Centre is at Welbeck House, 69 Loughborough Rd, West Bridgford, Nottingham, NG2 7LA (0602 810009).



■ The character being edited in *Font Designer* can have distortions applied quickly.



■ Support for multi-lingual applications is provided in *Headline*.

FONT DESIGNER

PCG, based in Barrow-in-Furness, Cumbria, has released *Font Designer*, a vector-font creation utility, for £. GDOS bitmap fonts, PostScript and Publishing Partner fonts can be created with the package. GDOS fonts can be created in any size from 6 to 72 point and for any output device. PCG is on 0229 36957.

HEADLINE

Gate Seven's package allows you to add large-sized text into documents. *Headline* makes it possible to go beyond 72 point text size and perform image processing functions on text.

The process involves entering text into a WYSIWYG display, selecting a font style and size and then saving the result in any of six graphical formats. Your graphics or DTP package is likely to support at least one of the standards.

Six fonts – Times 36, Helvetic, Antibold, Calypso, Oxford and Compacta – are included in the basic package. A further 50 fonts are available. *Headline* costs £49.95 while extra fonts are £20.

Gate Seven, 6A Gwendwr Rd, London, W14 9BG (01-602 5186).

Turbo 16 from FAST Technology is the latest in a long list of accelerator boards to appear for the ST.

The speed-up board, which slots into the ST's existing processor socket, incorporates a 16MHz CMOS 68000 processor and 32K of cache (very fast) memory.

Having 32K of cache memory means the 16MHz processor can run at full speed for longer periods of time. Cache is special high speed memory which buffers data as it is brought to the processor; subsequent data accesses can be made directly to the cache memory rather than the slower main memory.

The faster processor technically improves the ST's speed by 100% – 60%, though, is typical reconfig FAST.

Turbo 16 costs £299 and comes with full fitting instructions. FAST is on 0734 784933.

Bird food

J Sinclair, distributor of the Lake-meyer EPROM programmer reviewed on page 56 of this issue, has announced a hardware-based WORM drive that can be used in conjunction with the ROM blower.

The £150 write once read many device plugs into the ST's cartridge port and accepts 256K or EPROM (electrically programmable read-only memory). More from Sinclair on 01-316 1779.

Microdeal on show

Microdeal organised a recent press bash at the Novotel centre in London to show off their latest line of products. On display was *Goldrunner 3D* and several revolutionary new music products.

Goldrunner boasted super-fast 3D graphic routines likely to surpass even *ST Falcon*. *Goldrunner* can generate up to 360 polygons a second and judging by the demonstration it looks like being a major release for the PC Show.

On the music front was *Replay Professional* which Microdeal are looking at as the follow up to *Replay*. It will sell for £120, but for that you get three music programs – *Replay Prof.* (sample editor), *Drumbeat Prof.* (sequencer) and *Midplay* (MIDI synthesizer).

Replay Prof. features a 12-bit analogue to digital converter and an 8-bit digital to analogue converter allowing four channels of sound to be played simultaneously. The software permits sampling up to 48KHz – although only frequencies up to 30KHz can be played through the ST's monitor speaker – as well as superior editing facilities which allow you to edit clicks out of the sample or even draw your own sample curve. *Drumbeat* will let you sequence drums or other sounds and synchronise output with midi instruments. Finally, *Midplay* turns your ST into a professional sound sampling synthesizer with four-channel polyphonic sound. A maximum of 128 voices can be held in memory at once.



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Page the Oracle

Microtext, creator of the Teletext receivers for the Commodore 64 and Amstrad CPC, has come up with a system enabling ST users to display and download Teletext frames on an Atari ST.

The Teletext Adaptor provides access to any of the hundreds of pages available from Ceefax or Oracle. In addition to viewing Teletext pages, it is possible to save pages to disk in compressed format or as Degas images. Pages may be printed.

The system is programmable, which means it is possible to grab a sequence of pages and save them to disk or print them automatically. This can be set to occur at specific times of the day. Imagine

being able to get hold of the latest share prices three times a day or downloading all the football results.

FastText is included in the Adaptor; the software anticipates which pages are likely to be selected next and makes the available immediately by storing them in a buffer.



All resolutions are supported and two pages can be displayed side by side.

Microtext's Teletext Adaptor provides composite video and sound outputs, and is supplied with a lead enabling any monitor with a composite video and audio input (such as the Philips CM8833) to be used as a colour TV.

Price for the system is £148.93. Details from Microtext, 7 Birdlip Close, Hordean, Hants (0705 595694).

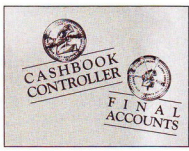
QUICKIES • QUICKIES • QUICKIES • QUICKIES

■ Hard drive specialist ICD has introduced version 4 of its FAST Hard Disk Booster. The new version includes an intelligent caching system that provides spectacular speed increases in data transfer to any hard drive system fitted with an ICD ST host adapter. The upgrade is free and can be found on GENie (m475:3 download area 22), CompuServ (ATARIVEN DL1) and ICD BBS 0101 815 9682229.

■ Software Express has acquired the UK rights to *Circuit Barcode Plus*, a point-of-sale and stock control system for small retailers and warehouses. The system supports all commonly used barcodes and provides full reporting of day, period or year transactions. At least 1Mbyte is required and a hard drive is recommended. *Circuit Barcode* costs £286.35 and is avail-

able from Software Express on 021 6439100.

■ The *Cashbook Controller* and *Final Accounts* combination is the latest business tool from Digita (0395 270273). *Cashbook Controller* lets you log cash and bank transactions. It provides you with a VAT summaries, monthly summaries and departmental analyses of sales and purchases, debtors and creditors and so on. *Final Accounts* produces a complete set



of accounts including trial balance, trading and profit and loss account, balance sheet, and full accounting ratios. The *Cashbook* combo weighs in at £69.95.

■ Anor has released *Prodata*, a database with multiple indexes, powerful search and comprehensive printing options. *Prodata* is available at the introductory price of £55 until the beginning of December. After that it goes up to around £80. Anor is on 0733 68909.

■ Rise Time Electronics has set up shop at 19 Quarry Hill Rd, Tonbridge, Kent, TN9 2RN (0732 351234). Educational software will be its speciality; demonstrations of any title will be given. The educational range includes titles for under 5's through to adult.

US GOLD

Andrew J Reader, C
O'Brien, Chi-Ho Lam, D
Bunting, David Willard, J C
Millington, Jonathan
McBrien, K A Siddiqui, Kirk
Ruehbohn, Leslie Cowley,
Luigi Antonioni, N Tait,
Neil Strathdee, Noel
Sumner, Paul Williamson,
Philip Mason, S Patel, S
White, Stuart Dawson,
Timothy Hodges.

MIRRORST LABYRINTH

A Gillespie, Adam Moore,
Adrian King, Alan Harley,
Alec Tucker, Alec Davidge,
Andrew O'Malia, Austin
Moore, B W Empson, Ben
Thomas, Christopher Smith,
Colin Robertson, D
Stevens, David Marston,
David Owens, E A Burrow,
Ian Pollard, J Christie, J

COMPETITION RESULTS

Time to take a deep breath folks - we've got one or two (!) fabulous *Format* competition winners to list from issue 13 of *ST Amiga* Fomat magazine...

Coates, J Curtis, J
Nurthen, J Wroblewski,
Jan Nymark Owen, John
Morgan, Jan Lewis, Jon
Simcoo, Julian Smith, K
Tang, Kevin Wilby, Khadi
Sharif, Lee Kennedy, Lao
Hartas, M Bedford, Mark
Ainer, Mark W Leyland,
Michael Poinerty, N Gani,
Neil Beighton, Nick
Flowers, Nick Roy, Nigel
Hill, P A Walls, P T
Holland, Paul Blakely, Paul
Saunders, Peter
Houlgreave, Phillip
Wright, R Dysart, R
Ramdhany, Ranjit Johal,
Raymond Browne, Robert
Bushnell, Robert Heald, S

R Perks, S Tachner, Shane
Marley, Simon Slack,
Simon Wright, Steve
Hitchison, Steven
Gallagher, Steven McNally,
Tom Haslam, Tyson
Lowman, W Nicholls, D
Doughty

WICKED

A J Carrey, A T Green,
Alex Horwood,
Andrew Williams, Barry
Figgott, Chris Clifford,
Edward McLeod, G
Cartawick, Gary Fenton,
Glen Parry, Graham Love,
Ian Bridger, Jason Cole,
Jonathon Webb, Lazz, Mark
Coleman, Matthew Border,

Matthew Bruce, Neil
Dawson, Neil Sowler,
Omar Cummins, P Turner,
S Hilder, T Walker

CRAZY CARs

Adam Richardson, Alex
Mackey, Andrew Tulloch,
Anthony Twist,
Christopher Graham, D A
Parkes, D G Jones, Darren
Creese, Dick Cook, G
Cowdry, J Byford, J L
Mackey, James Noble,
Keith Mortimer, Lewis
Jones, M Hayden, M
Maplesden, Malcolm
Edwards, Mark Sutton,
Matthew Sadler, N Hayes,
Nicholas Burdon, P
Downes, Paul Bailey, Paul
Cooper, R Pugh, S C
Wrigley, S Cleaver, S L
Houghton, Steve Wood,
Vincent Childs

ST FORMAT NEXT MONTH

The November edition of *ST Format* hits the streets on THURSDAY OCTOBER 19
Look out for:

CRASH COURSE

Projects UK runs a music studio based around the ST. Training courses are held using the latest in music technology, MIDI and the ST.

CRACKING

Why it's such fun and how it's done. A cracker reveals all and provides a public domain game on the Cover Disk to experiment with.

STE EXPLORED

An in-depth appraisal of Atari's new machine. The hardware, the people behind the design and what programmers think will be possible.

DUMPING GROUND

Alternatives to the Atari SLM804 laser. All you need to know when buying a laser printer.



SCENE IN AMERICA

The hardware and software that hasn't made it across the great divide yet. Marvel at what could be on your desk in six months time.

NEVERENDING STORY

A great new adventure section starts. The Count lets you in on all that's due, reviews the new, and provides tips too.

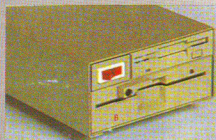
PLUS

Reviews of the Kempston Data Scanner, *That's PC Speed* and *HyperChart*; PC Show report; tutorial on CFA BASIC; music and graphics sections; the hottest games.

Due to the dynamic nature of the ST market, we can't guarantee that all features mentioned will end up in next month's magazine. We can, however, guarantee that if anything gets replaced, it will only be an even better feature.

A selection of special deals only available

Triangle 3.5"/5.25" Multidrive £199 With PC Ditto £249



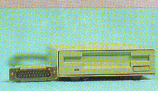
The King of ST disk drives with combined 5.25" and 3.5" units and built in PSU. A special lead provided allows you to use both drives and your internal drive together and the 5.25" drive is fully 40/80 track switchable. This drive is ideal for using with PC Ditto or as an economical 2nd & 3rd Drive.

ideal for using with PC Ditto or as an economical 2nd & 3rd Drive.

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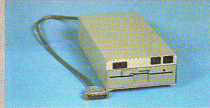
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(Ram board available separately)

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**Call us now for a
price on an Atari Mega
System!**

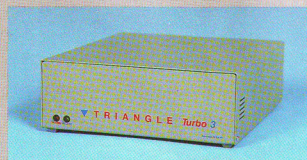
Triangle 5.25" Disk Drive £99 With PC Ditto £149



This fully switchable 5.25" 40/80 track drive can be used to read and write PC formats as well as normal ST formats. Comes complete with instructions and built-in PSU.

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Power House, the direct sales arm of Power Computing Ltd - Leaders in peripherals & software - is the natural choice for the Amiga enthusiast. Highly competitive prices, a wide choice, fast computerised service and the backing of a £2M+ 5 year old company are just some of the reasons for tele-shopping at Power. Large stocks, friendly reception and "if it don't work we give you a new one" are a few more!



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Atari's autumn attack

● Atari is expected to announce a new line-up of ST-compatible computers at the Atari Messe in Dusseldorf August (see page 14 for a full report). The STE is the rumoured "Amiga-buster".

● The now-legendary TT is also expected in Dusseldorf. The TT is Atari's long-awaited 68030-based machine, able to run at



■ Atari's new STE - looks a bit like a 1040, doesn't it?

16MHz and featuring great colour and sound using the Yamaha sound chip and a complete video subsystem. The TT will be completely TOS-compatible, and will be priced reasonably for small business and home consumers who want extra power. A future version of the TT, currently called the TT/X, will be able to run the multi-tasking Unix operating system.

● Atari also hopes - barring FCC problems - to begin shipping the Atari Portfolio handheld and several PC-compatibles to American markets soon. Atari US has promised its dealers delivery in time for Christmas.

● Atari's new handheld game machine, the Lynx (formerly called the Atari Portable Color Entertainment System) should also begin shipping in quantity in time for Christmas.

ALL THE WAY FROM AMERICA

Format's foreign correspondent, EUREKA, reports on all the latest happenings at Atari from across the great puddle.

The emulation game

MSDOS and Apple Macintosh emulators for the Atari ST have long been best-sellers in the US. The widespread usage in America of PC-compatibles and the Mac have made the ST's emulation capabilities one of the machine's key selling points. Most popular for PC emulation is PC Ditto, from Avant-Garde Systems of Jacksonville, Florida. Spectre 128, from Gadgets by Small of Littleton, Colorado, provides Atari computers with the ability to function just like a Mac - but with faster processing speed and wider screen area.

Both of these manufacturers recently announced second-generation releases of these products. PC Ditto II is a hardware-based emulator, and allows the ST to run PC programs as fast as an IBM AT. The original PC Ditto was software-based and consequently provided no performance improvements.

Gadgets by Small has announced plans to sell the Spectre GCR. This software/hardware device combination will permit the ST to read and write Macintosh disks without translation or modification. Such high-end Mac programs such as HyperCard, PageMaker, Adobe Illustrator 88, and others are all

compatible with Spectre and run without problem on the Atari.

PC-Ditto II is expected to begin shipping in August. Suggested retail is \$299.95. The Spectre GCR requires Apple Mac ROMs, available from Apple dealers. The Spectre GCR is expected to begin shipping in September. Suggested retail will be \$299.95.



■ Fancy a PC? The hardware-based PC Ditto II will give your ST fast PC emulation.

ST steals MIDI market

A recent survey by Keyboard magazine, a respected American musician's monthly, found that Atari computers are the most popular among recent computer purchasers. Asked "if you bought a computer in the last 24 months, what did you buy?" 31 percent of the magazine's readers had purchased STs or Megs. Only 27 percent had bought IBM compatibles and only 26 percent had purchased

Apple Macintosh machines.

Atari had better watch out, though. 22 percent of the magazine's readers plan to buy a computer in the coming year. More than half are considering the Macintosh, compared to only 23 percent looking at the Mega or ST. Of course, wanting to buy an Apple and actually being able to afford one are two different things.

Atari is five! TOS 1.4 - sort of

Atari recently celebrated its fifth anniversary of success after taking over from Warner Communications by giving a party for employees at its Sunnyvale, California, headquarters.

At the gathering, Sam Tramiel, president, stated that Atari has significant plans for growth over the next five years. He hopes to see sales of \$1 billion next year...

Despite widespread demand for an operating system update, Atari Corporation still has no plans for mass distribution of TOS 1.4. Atari has announced to U.S. dealers that TOS 1.4 PROMs are available with delivery of complete Mega/SLM804 bundles.

Distribution of TOS on this limited basis is due to the fact that the new 1280 x 960 Monitorm monitors require TOS 1.4 for operation.

TOS 1.4 was designed primarily to support the new STE. However, when used with ST or Mega computers, the new operating system can provide significant performance enhancements - including the ability to format PC-compatible disks.

Changes have also been made to the file selector, the disk copy/format dialogue box, and the ability to auto-boot applications.

XENON

2

MEGABLAST

XENON II: MEGABLAST

XENON II: this time it's war!

The Xenites are back and have thrown time itself into turmoil, only you can save the day – not to mention the universe!

BATTLE through five VAST, graphically UNCANNY levels, DESTROYING wave after wave of EVIL aliens with the DOZENS of POWERFUL WEAPONS at your disposal.

XENON II: HARD, fast COIN-OP QUALITY destructive action with a HOT soundtrack to match. A mind blowingly accurate David Whittaker rendition of the 'Bomb The Bass' Megablast.

XENON II: It's out of this world!

XENON II: It's a Megablast!

XENON II: it's a Bitmap Brothers game!

Available Soon on Atari ST, AMIGA & PC.



Screen Shots From Atari ST Version.



© 1989 MIRRORSOFT LTD.
© 1989 THE BITMAP BROTHERS
MEGABLAST written by Tim Simenon
Produced by Simenon/Gabriel
Appears courtesy of Rhythm King Records
Published by Rhythm King Records



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As predicted almost a year ago in *ST Amiga Format*, Atari officially launched two enhanced STs, the STE and TT, at the largest Atari-specific show in the World.

The STE displayed at the August Atari show (or Atari-Messe) in Dusseldorf, Germany, has been on the cards for some time and many UK developers have already got their hands on them. The machine, however, will only be available in the shops later in the year. Said Bob Gleadow, head of Atari UK's operations, "We're looking at a November launch for the 1Mbyte version of the STE. It is intended to replace the existing 1040 and will be priced identically: £499."

While Gleadow was evasive about an availability date for, or indeed confirming the existence of, a 512K version of the STE, he did comment that he'd like to keep the current low-end ST going for as long as possible.

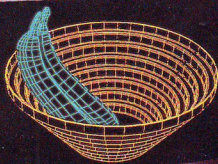
Very briefly, the STE is similar to the ST but with an extended colour palette, stereo 8-bit PCM sound chip, vertical and horizontal hardware scrolling and extra game-controller ports. See page 15 for further details.

The TOS-compatible version of the 68030-based TT (see specifications below) was displayed at the show, and is expected to be available in the UK later this year. A tower version of the TT consisting of 4Mbytes of RAM, 60-80Mbytes hard drive and offering TOS and Unix V operating systems will be ready early next year. MS-DOS emulation will also be available at some point in the future.

During a press conference Jack Tramiel proclaimed: "Atari is committed to the personal computer business; back in '77 I made machines affordable to the masses. I haven't forgotten that commitment!" Tramiel's words are to be taken seriously when you consider that the STE with 1Mbyte of memory costs the same as the current 1040ST and the TT-plus-monitor comes in at £700DM (around £1900 at today's exchange rates).

The STE, it seems, provides you with a taster of what the TT offers, and is likely to replace the ST completely by the end of next year. The TT meanwhile will be aimed at professional users wanting the power of a workstation.

■ Look out for an in-depth review of the STE in the next issue of *ST Format*.



POWER PACKED

Two new ST-compatible machines launched in Germany, RICHARD MONTEIRO was there.

ATARI TT SPECIFICATIONS

Looking like a deep pan pizza on a tray, the TT represents something of a departure from the clean, stylish casing of the Mega STs. But it's what's inside that counts.

For under £2000 you get the TT0302, a 68030-based machine with high resolution colour monitor and 30Mbyte hard drive. The TT/X (a tower version of the TT) offers greater memory, more storage and the Unix OS. It will be available next year for around £1500 more than the TT.

The TT is ST-compatible - or as ST-compatible as is possible using an '030 chip - with phenomenal processing power, great expansion possibilities, and tremendous sound and graphics capabilities.

Processor: Motorola 68030 clocked at 16MHz. Optional 68881/2 maths co-processor.

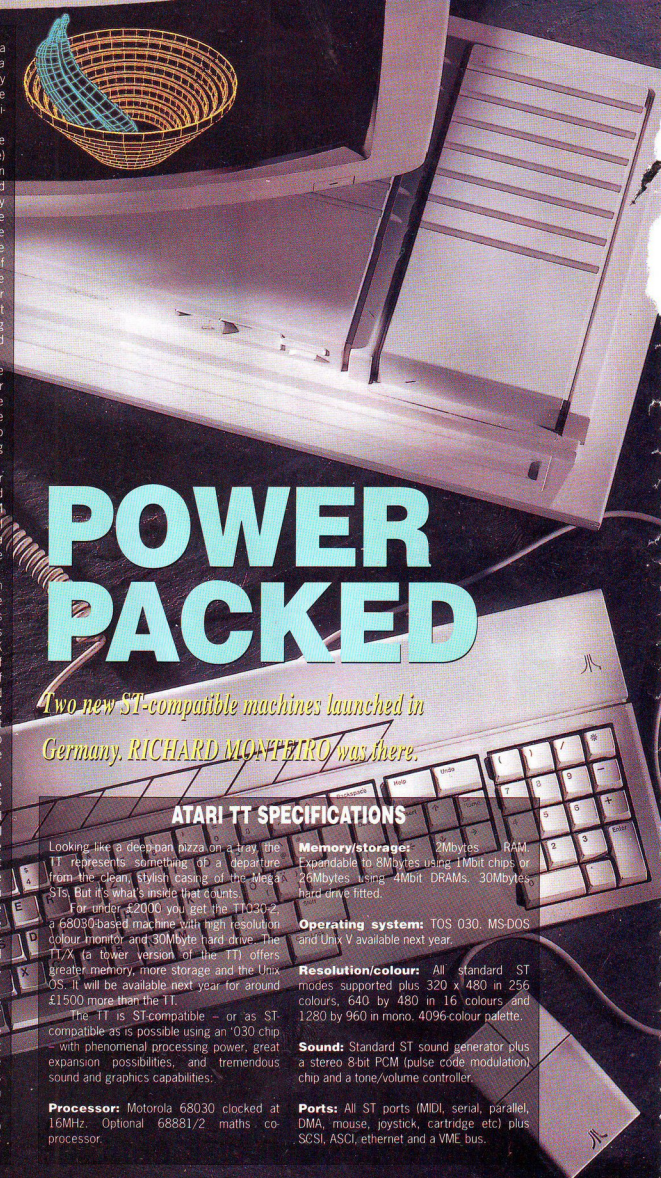
Memory/storage: 2Mbytes RAM. Expandable to 8Mbytes using 1Mbit chips or 26Mbytes using 4Mbit DRAMS. 30Mbytes hard drive fitted.

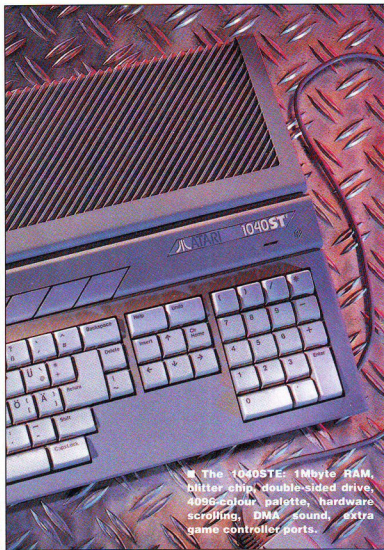
Operating system: TOS 030, MS-DOS and Unix V available next year.

Resolution/colour: All standard ST modes supported plus 320 x 480 in 256 colours, 640 by 480 in 16 colours and 1280 by 960 in mono. 4096-colour palette.

Sound: Standard ST sound generator plus a stereo 8-bit PCM (pulse code modulation) chip and a tone/volume controller.

Ports: All ST ports (IMDI, serial, parallel, DMA, mouse, joystick, cartridge etc) plus SCSI, ASCII, ethernet and a VME bus.





■ The 1040STE: 1Mbyte RAM, blitter chip, double-sided drive, 4096-colour palette, hardware scrolling, DMA sound, extra game controller ports.

THE STE'S TECHNICAL DETAILS

New controller ports on the STE mean that keypad-type joysticks, analog paddles and light pens/guns can be attached. In fact, six joysticks can be plugged in. Family entertainment or what! The two new non-standard controllers, both 15-pin affairs, can take two joysticks each. However, an adaptor must be found from somewhere before normal joysticks can be plugged in.

Horizontal and vertical pixel and eight-pixel hardware scrolling has been implemented in the new machine. The screen can be subdivided into several independently scrolling regions.

The colour palette has been expanded to 4096 colours from 512. The resolutions remain the same as do the numbers of colours allowed on screen in each mode.

Two sound generators are present: the standard ST YM2149 three-voice square wave chip and a stereo 8-bit DMA chip. Both can be played simultaneously and output can be sent to the STE's stereo jack. The new sound chip is a digital to analogue converter (DAC) and plays samples at various frequencies from 6.25KHz to 50KHz. The signal is supplied to an

LMC1192 volume and tone controller before being sent to the internal speaker or stereo RCA jack.

Finally, a blitter chip and double sided drive are fitted as standard.

At first the STE doesn't look to be as exciting as many of the early rumours made it out to be. However, much more processing power is available for number crunching, moving software sprite and palette switching because the processor doesn't have to worry about sound or scrolling. Dedicated hardware looks after that.

It will be interesting to see what programmers make of the machine. All software written for the STE will have to be compatible with the ST – so unless programs are written with the STE in mind, there will be no advantages in having an STE to begin with. Certainly as more and more STEs are sold, programs will start appearing that make explicit use of the STE's expanded hardware. The only option open to programmers at present is to write two versions of the program and store the ST version on the top side of the disk and the STE version on the bottom side.

TALL SHOW STORIES

Unlike the UK, the bulk of Germany's ST user base use the machine as a professional tool. Forget the box shifters, the barrow boys and the screeching kids; the German Atari show was an impressive insight into how the ST can be used.

■ For LA networking of STs, modems, plotters, laser printers, hard drives there's rho-NET. Up to 127 devices can be attached by a maximum of 2000 metres of cable. Theoretical speed is 2Mbit/s while throughput is 120Kbytes per second. An Ethernet gateway – for talking to PCs, Macs, VAXs and other machines – operating at 10Mbit/s is possible. More from rhothron GmbH at Entenmuhlstäbe 57, 6650 Homburg/Saar.



■ The Eickmann solution.

documents from Calamus are sent to the Lino. An A4 1270dpi document will typically take four to five minutes to process and print. Signa Publishing on 0252 341600 in the UK are distributing the interface, which costs around £3000. Cheap compared to similar technology for other machines (the Mac RIP unit costs over £10,000).

■ One monitor for all ST resolutions? Yes, it's possible! Although colours appear as shades of grey. Still, if you can live with that and 248DMs less in your pocket the Eickmann EM-124 Multisync is the perfect choice. Especially as it, and the 698DM colour version, match the ST's style and colour. Eickmann is on 01049 69 763409.

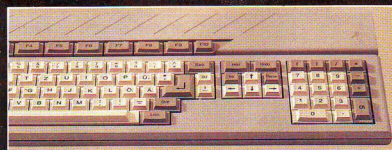
■ The C128 Colour Videocontroller for Mega STs from Matrix offers non-interlaced resolutions of 1400 by 1024 pixels in 256 colours, 1664 by 1232 in 16 colours and 850 by 512 in true colour (well, 16 million). The board comes with one or two megabytes of dual-port VRAM and an i82786 graphics controller. The graphics processor offers hardware windows, zooms and overlays. You don't want to know the price. Call 01049 7191 4088 if you do.

■ Galactic (01049 201 273290) in Germany has several ST genlock devices. Tell them what you want to do and they'll provide the goods.



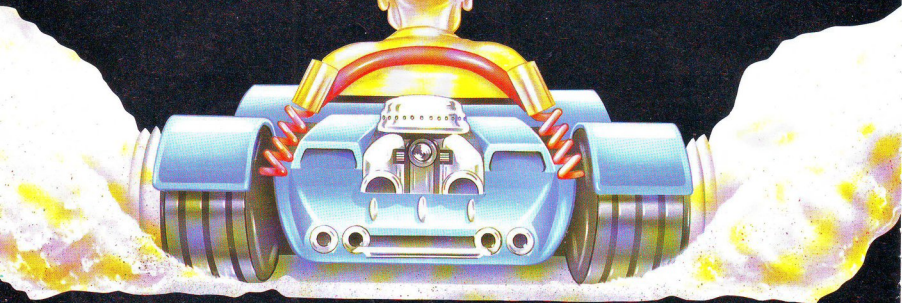
■ In Germany STs are used in industry to control all manner of operations, particularly measuring, control and automation tasks. In fact one company, IBP, has gone as far as making up industrial control units based around the ST. Together with all the standard bits that make up an ST, the 190ST unit pictured above has an audio oscillator, voltage-dependent rest logic, watchdog software, Eurobus, ECB-bus, SMP-bus, and a VME-bus. A portable version of the above is also available with a 9-inch medium resolution monitor. IBP is on 01049 511 630963.

■ DMC, creator of Calamus, has produced LINO-interface for connecting the ST to a Linotron 100, 200, 300" or 500 phototypesetter. Absolutely superb quality output is possible when



■ If you're unhappy with your ST's keyboard, RTS Elektronik can kit you out with a comfortable alternative. A complete set of 520/1040 keys costs 99DM while the Mega key kit costs 105DM.

POWER DRIFT



IN POLE POSITION...



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A further development

Prospero Pascal and Fortran for GEM have long been established as standard programming environments for professional developers using the ST. Prospero C is also gaining wide acceptance as the first ANSI conforming C compiler for the ST.

Building upon the experience that we have acquired and the feedback we have received from our users, we have launched the Prospero Developers Toolkit for those who wish to extract the most from their ST. The features of the Toolkit are:-

- | | |
|----------------------------|---|
| Macro assembler | We wrote this for in-house use because no available assembler satisfied our requirements; it is now available to others with similar exacting requirements. |
| Resource editor | Resource editor for creating and maintaining AES resource files. |
| Make facility | This automates the process of compiling and linking files, and is invaluable for large programming projects. We also include a suite of programs to generate make control files! |
| Command interpreter | When the Atari desktop proves cumbersome this MS-DOS style command line interpreter proves invaluable. With the command line interpreter, you can handle groups of files quickly and efficiently, with full batch capabilities making it ideal for project maintenance. |
| Workbench | Based upon the acclaimed workbench supplied with our compilers for the Atari, but enhanced to allow all three compilers, plus the assembler, make facility and command line interpreter mentioned above to be used with single key simplicity. |
| Utility programs | Various useful tools that we at Prospero have found invaluable in our own developments. |

The Prospero Developers Toolkit costs just £69 (inc VAT). For further details of this or other Prospero products, phone or write to the address below.

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FORMAT10

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SUN

Jasper Carrott may make fun of the Sun, but he might eat his words once he's tried his hand at this Sun crossword.

TIMES

The Sun crossword too easy? Try this Times version...

TRACKER

This month's hardware project (see p35) is a device that shows you which track and side the disk drive is reading. Tracker is program that helps you to test your newly-constructed project.

Side B

FRACTAL SURF

This month's feature on chaos theory (see p20) includes illustrations provided by Fractal Surf. Try it for yourself and explore the world of fractals.

MANDELSHOW

This program will give you an introduction to the strange world of the Mandelbrot set.

MAGIC EYE

Get hypnotised by this weird and wonderful fractal demo.

GFA DEMOS

This month's GFA BASIC tutorial covers sound and here are a handful of demo programs to show what is possible.

SLIDE

A slide show program that not only displays pictures in all three resolutions, but also converts them from one resolution to another. This month there's a selection of reader pictures - and one lucky £30 winner.

TINYSTUF

Pictures on the cover are often compressed to save space and so *Tinstuf* comes into its own in converting *Tiny*, *Degas* and *Nochrome* pictures from one format to another.

SCREEN EMULATORS

A colour emulator for use with monochrome monitors and a monochrome emulator for use with colour monitors. Both from GFA Data Media.

The Cover Disk contains 800K of demos, games and utilities, but unfortunately not all 520STs have double sided drives.

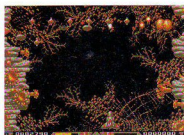
To counter this problem a special format has been devised that allows single-sided STs to read just the A side of the disk, but double sided drives can read both.

There are effectively two sides to the disk - A and B - and you can only run programs from one side at a time. To change sides you just have to

click on the file called GOTO_A.PRG or GOTO_B.PRG. If you have a single sided ST then don't worry about doing damage to your disk, you can't swap to the other side. Sorry, but life's like that. Details on how to get hold of the B-side are on the next page.

One final and important point - the CD MUST be left write enabled at all times. If it isn't then you WILL NOT be able to switch to the other side of the disk.

XENON 2



BY: MIRRORSOFT

SIDE: A

MACHINE: ALL COLOUR STS
FILES: X2.PRG, X2DEMO.BIN

Xenon 2 is one of this month's Format Golds, and just to show you how good it is there's a playable demo on the cover disk.

The demo consists of half of



the first level, including a visit to the shop.

When you visit the shop you can sell any goodies that you found on the way through and buy some different weapons to blast the aliens with.

After the shop you return to the start of the level and begin again.

To get going just open the folder XENON_II, double click on X2.PRG, and pick up your joystick for a dose of sensational shoot-'em-up action.



SUN CROSSWORD

BY: AKOM

SIDE: A

MACHINE: ALL STS
FILES: SUN.PRG, SUN1

If you have problems finishing this Sun crossword (shame on you!) then the program will give you some help; and if you're still stuck a solution is available within the program.

Just double click on SUN.PRG in the SUN folder and when asked for the crossword number type in 1 and press return.

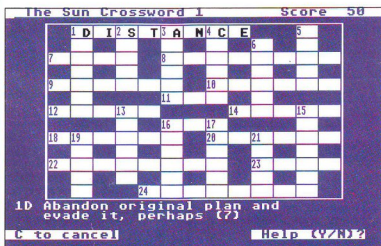
TIMES CROSSWORD

BY: AKOM

SIDE: A

MACHINE: ALL STS
FILES: TIMES.PRG, TIMES1

If the Sun crossword is too easy, have a go at the Times crossword instead. Again, you can get help with the answers, but you'll have a negative score and everyone will know you've cheated. Just double click on TIMES.PRG in the TIMES folder and when asked for the crossword number type in 1 and press return.



TRACKER

BY: R. SOUL
SIDE: A
MACHINE: ALL STS
FILES: TRACKER.PRG

This was written specifically to test this month's hardware project. It reads data from each track in turn and displays the track number on screen along with the side of the disk being read. The tracker device should display the same track number - if it doesn't, you've done something wrong. Double-click on TRACKER.PRG and follow the on-screen instructions.

FRACTAL SURF

BY: JONATHAN MILLAR
SIDE: A
MACHINE: ALL STS
FILES: FRACSURF.PRG, FRAC-SURF.DOC

A random landscape generator that works in both low and high resolution. Various factors can be altered to create thousands of different landscapes and once you have them they can be saved as Degas screens and the viewpoint modified. For more on fractals, see page 20.

MANDELSHOW

BY: NIC SHULVER
SIDE: A
MACHINE: ALL COLOUR STS

FILES: MANDSHOW.PRG, SPIKY1.POS, SPIRAL.POS, STARTPOS.IFF, README.DOC

To coincide with the fractal graphics feature on page 20 there's a Mandelbrot generator on the cover disk. README.DOC gives you extra information, and the program is simple enough to use as all options are on pull-down menus.

DSLIDE

PUBLIC DOMAIN
SIDE: B
MACHINE: ALL STS
FILES: DSLIDE.PRG, DSLIDE.DOC

Here's how to convert pictures from one resolution to another - even from colour to mono. Pictures in Degas, Tiny and Neochrome formats can be converted. It's also possible to create a script file which will set up Dslide to show pictures in a particular order and set the delay etc. Details are in the file DSLIDE.DOC.

TINYSTUF

PUBLIC DOMAIN
SIDE: B
MACHINE: ALL COLOUR STS
FILES: TINYSTUF.PRG

The pictures on the B-side of the disk are in one of three formats: Degas, Neochrome or Tiny.

Tinstuf will convert pictures from any of the three formats to one of the others.

Double click on TINYSTUF.PRG and then follow the on-screen prompts.

GFA DEMOS

BY: BARRY CAPEL
SIDE: B
MACHINE: ALL STS
FILES: SAMPLE.LST, SAMPLE1.SPL, BASCODE.EXE, 30SOUNDS.LST

This month's GFA BASIC demos are all about sound. There are two listings: one that shows what can be done with the sound chip and another illustrating the use of sampled sound. More on page 97.

**MAGIC EYE**

BY: CHRIS LLOYD
SIDE: B
MACHINE: ALL COLOUR STS
FILES: MAGIC.EYE.PRG

Mandelbrot and music mixed together in a mindblowing multi-coloured mosaic of madness. This demo was prepared using STOS and the STOS compiler. It shows

THE FLIPSIDE

Single-sided drive owners can get hold of the B-side on disk by sending their name and address with a cheque or postal order for £1.75 to: B-Side, ST Format, 4 Queen Street, Bath BA1 1EJ.

what can be done with a few pictures, a music sample and only a few lines of program.

Simply turn off the lights, turn on the ST and double click on MAGICEYE.PRG.

GFACOLOR AND GFA MONO

BY: GFA DATA MEDIA
SIDE: B
MACHINE: ALL STS
FILES: GFACOLOR.PRG, GFAMONO.PRG

Many Cover Disk programs will only run on either a colour or monochrome monitor. So we've added an emulator for each monitor type. Full instructions are in .DOC files the emulator folders.

The emulators won't work with all software, but it's a lot cheaper than buying two monitors...

DEMOS AND PICTURES

If you have any demos lying about that you think are good enough to go on the ST Format Cover Disk then send them in to us. They should be under 200K and MUST be in a form that can be clicked on from the desktop.

And budding artists out there stand to earn themselves some realies. It doesn't matter what format your pictures are in - Tiny, Degas, Neochrome, Spectrum 512 or Quantum Paint - we'll use the best on the cover disk. The month's winner earns £30!

MAKING A BACKUP

The cover disk uses a 400K per side format rather than the normal 360K. To fit all of the programs on a standard disk you'll need the special formatting program on the cover disk, "FORMAT10.TOS". To copy the A side:

- Double click on the program "FORMAT10.TOS" then take out the cover disk.
- Put the disk you want to format in the drive then follow the on-screen prompts. Formatting erases a disk completely!
- Put the cover disk back in the drive.
- Double-click on the drive B icon and on the drive A icon. If you have only one drive then put the newly formatted disk in the drive when it asks for drive A. You'll now have two windows on the desktop - one for the cover disk and one empty.
- Copy the files as normal by picking them up from the cover disk window and dropping them in the empty window. DON'T copy the files by dragging the drive icon containing the cover disk files into the empty window because the cover disk contains some hidden files that you don't need. DON'T copy the file GOTO_B.PRG - it'll damage disk data if you use it on anything but an ST Format cover disk.
- To copy side B of the disk, double click on the file GOTO_B.PRG and repeat the above process.

EARN £800

Yes, earn £800. We want your software - games, utilities, demos, anything that's good, original and preferably short. If you've written anything you think is worthy of the ST Format Cover Disk, send it with this form and full documentation to: Gary Barrett, ST Format, 4 Queen Street, Bath BA1 1EJ. Please allow one month for replies.

NAME _____

ADDRESS _____

DAYTIME TELEPHONE _____

PROGRAM NAME _____

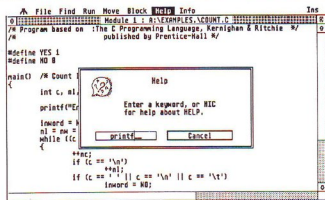
SIZE OF FILES IN K _____

DESCRIPTION _____

Don't forget to: ■ Enclose an SAE for return ■ Include on-disk and paper documentation ■ Write your name and address on the disk ■ Use a virus-free disk.

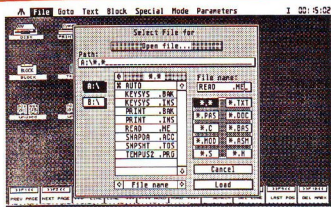
Please sign the following declaration: This program is submitted for publication in ST Format. It is wholly my own work and thus I agree to indemnify Future Publishing against any legal action should copyright problems arise.

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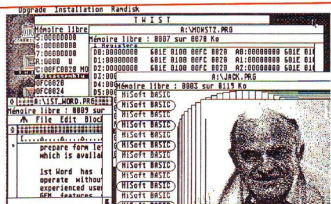
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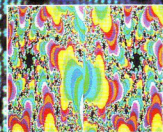
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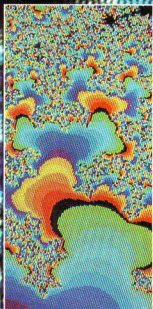
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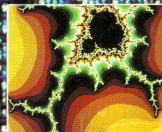
Mathematicians believe that fractal graphics mirror the randomness of the real world. HUGO ALLEN explains how to explore chaos on your ST



■ Acid or what? Aided from the Magic Eye fractal demo on this month's cover disk.



■ Not just pretty patterns: fractal mathematics may describe the structure of all natural objects.



■ Generate your own Mandelbrot set with MANDSHOW.PRG on this month's cover disk.

QUICK SET

Nowadays any home micro can plot the Mandelbrot set. 8-bit machines need to run overnight to draw it, the ST can do it in a matter of minutes while an Archimedes with its 32-bit RISC processor can calculate the set in less than three seconds.

If you write a Mandelbrot program, try to optimise it for speed and let us know how fast it runs.

At school, physics teachers did their best to impress on us how simple the world was. Newton figured out two or three one-line rules and that wrapped up movement. Boyle sussed gasses in a single phrase. The world was portrayed as huge interwoven network of cogs and gears, going its inevitable way about its business, each part describable in the simple mathematics of an O-level student.

We all know from personal experience, however, that it's not like that. The most common things behave erratically and randomly, defying prediction.

Take the weather. We can all predict what the weather will be like in 10 minutes time; just look out the window. As likely as not we could make a fair guess about this afternoon, using our experience of past days' weather to guide us. Weather men can go a little further using satellite pictures and barometer readings to estimate tomorrow's winds and rain. But the most sophisticated meteorological techniques and most up to date computerised analysis methods cannot foresee even a week ahead.

MAKING WAVES

Situations which you might, from a quick look at the mechanics, expect to be simple often turn out to be dazzlingly complex. For example, a boat moving through water should be quite easy to model with mathematics, especially if you remove variables like currents and wind. Sure enough, you can describe the movement of the boat with the equations of motion, and the wake spreads out from the boat in a nice geometric shape, its strength decaying evenly with distance. But move the boat a little faster and the wake breaks up into frothy turbulence which defies mathematical analysis.

Mathematicians for years beavered away on understanding complex systems like turbulence and weather. They had little luck; the problems were beyond their tools to solve.

Many of us suffered calculus at school. Differentiating and integrating meaningless bits of algebra is the bane of every mathematically-inclined sixteen-year-old's evenings. But those rules for breaking apart equations have no answers when presented with the mathematics of natural systems - the rules just don't apply.

The scientists who study subjects like meteorology and fluid dynamics have to learn to do things empirically because mathematics lets them down, or rather

did, until the new science of chaos theory was born. Chaos theory explains how a simple set of rules can lead to an infinitely complex result and gives some pointers about analysing the randomness.

PICTURE THIS

Chaos theory has become tightly bound up with the study of fractals. Fractals provide a way of looking at modelled chaos graphically; patterns become clear in randomness.

The term fractal was coined by Benoit Mandelbrot nearly 15 years ago. Fractals are objects with no scale. A fractal object viewed at one magnification looks like the same object seen closer to, or from further away.

This sounds like a very rare property, but nature is full of fractals. Imagine a map of Britain; a route planning map which takes in the entire country. In your mind's eye examine the coastline; it twists and turns at random with sweeping bays and huge promontories. Now imagine an inch to a mile map of a section of coast, say Land's End. Those same curves and jagged edges are there too, the line of the coast has a constant "twistiness". The same line appears if we look at a detailed plan of a stretch, or a sketch of the edge of a rock pool.

The line of the coast looks much the same no matter what magnification you choose; it is a fractal. The language of fractal geometry also gives us the words to describe the crinkliness of an object like the coast. A straight line is one-dimensional. The more it "crinkles" the closer it comes to describing a plane, until an infinitely crinkly line forms a plane; a two-dimensional object. A fractal line is very crinkly indeed, the closer you look at it the more twists are revealed, so it has a dimension of between one and two. Mathematicians can put a figure on this "fractal dimension". The British countryside has a fractal dimension of about 2.3.

SET THEORY

The classic computer-generated fractal is the Mandelbrot set. The pictures of twisting multicoloured tendrils have become the emblem of both the study of chaos and of the power of computer graphics.

The Mandelbrot set can rightly stand for chaos. As in the case of the boat example we looked at earlier, a very simple set up produces a complex, unpredictable result. The code which produces the set is so simple it takes scarcely a dozen lines of BASIC to write it.

The Mandelbrot set is a graph

of complex numbers. Complex numbers are a mathematical convenience which enable many otherwise insoluble problems to be tackled. They are written in the form $6+4i$. The 6 is the "real" part and the 4i the "imaginary" part - the mathematician who invented complex numbers was clearly related to the physicist who named the quarks as up, strangeness, charm and so on. The "i" is the square root of -1, a fictitious number.

The Mandelbrot set describes what happens when complex numbers are repeatedly passed through a simple equation. The equation is:

$$z(\text{new})=z(\text{old})^2+c$$

BIG BLUE, GREEN, RED...

Benoit Mandelbrot was one of the small group of research mathematicians kept on by IBM. In 1979 he was working on iterations of complex numbers and the phenomena known as Julia sets; intricate graphical representations of complex equations.

His initial printouts were on a simple line printer, barely recognisable strange blobs. Eventually he exhausted the computing power of the machines at Harvard where he was working and shifted to IBM's research centre at Westchester County in New York state. Here the familiar Mandelbrot set images appeared.

(The \wedge symbol represents "to the power of", and should be used when typing the equation into your computer). In the equation, c is the complex number being tested and z begins at zero. When a complex number is put through this equation and the result repeatedly fed back into it two things can happen to z . Either z can zoom off to infinity with successive squarings, or it can cycle around, never committing itself to becoming ever larger. This latter group of complex numbers are the Mandelbrot set.

Paradoxically the brilliantly hued pictures you often see of the Mandelbrot set, including those on these pages, are not of the set at all, but of the area on the graph very close to the set: the colours indicate just how close.

LESSON TIME

Before you can write your own Mandelbrot set program you need to know how to add and multiply two complex numbers together. The process is quite simple.

To add complex numbers just add the two real parts and the two imaginary parts, so $4+2i$ added to $7+4i$ gives $11+6i$. To multiply complex numbers you multiply each part in turn by both parts of the other number, then add the four resulting numbers together. So to multiply the two we've just used as an example, 4 times 7 is 28, and 4 times 4i is 16i. 2i times 7 is 14i and 2i times 4i is $8i^2$. As i is the square root of -1, i^2 is -1, so $8i^2$ is -8. Adding the four gives $28+16i+14i-8=20+30i$.

To write the program you need to produce a routine which will tell you if a point is in the set or not. A simple loop can test each point by putting it repeatedly through the equation. If at any time the value of either the real or imaginary part becomes greater than two or less than -2 then the series will continue to infinity and the point is outside the set. A loop of a few hundred iterations is enough to tell for most points.

The colours on a Mandelbrot set screen are chosen according to how many loops of the equation the program had to go through before the number went out of range. The colours are chosen arbitrarily, 0-20 loops as red, say, 21-40 loops as green and so on. The colours in a Mandelbrot set have no significance whatever.

If you write your own program, or use the one on the cover disk, you will notice the property which defines true fractals; self-similarity. The Mandelbrot set as a whole has a very distinctive beetle-like shape; as you zoom in to it set you will see rough copies of the shape dotted around. Enlarging these will reveal still more. The process continues infinitely, but your ST will only be able to show a few successive magnifications because the numbers involved quickly exhaust the arithmetic accuracy of the processor.

You will also see little islands away from the main body of the set, often miniature duplicates of the entire object. Enlarging these will reveal that they are connected to the set properly by thin threads. Even if the resolution of your screen won't show the threads they are there, it's been proved mathematically.

LAND HO!

Mandelbrot sets are by no means the only way a computer can model the chaotic world. As we've seen coastlines are fractals, and so indeed is the countryside. It's quite simple to write a program to produce an artificial landscape, and it's illuminating to alter the fractal

MAGIC EYE OF THE DISK

Da doom, da doom, da da doom... Acieeeeeed! It had to happen. Acid House meets ST. Chris Lloyd pictured above is creator of the Magic Eye demo on side B of the disk. To run it, simply double click on the file called MAGIC.EYE.PRG. Sit down, watch and enjoy...

Explains Chris, "I got the inspiration from the amazing pictures that can be produced with the Mandelbrot generator given away on an early ST Amiga Format Cover Disk."

The demo was written using Mandarín's STOS interpreter, STOS compiler and Maestro sound sampler.

Although the code required to make the demo tick is little more than 1K, the graphics and sound take over 100K in compressed form. "The sample was nicked from the PD and consequently took no programming time; the graphics took just over five hours to generate - after that it was just a matter of adjusting the colour palette. Surprisingly, tweaking the palette was the hardest part. I suppose, Magic Eye took around 12 hours to produce."

"Magic Eye is a just taster - enthused Chris, "as I'm working on a version that will fill an entire disk and come with numerous samples and some really spectacular graphics..."

Chris is hoping to take his concept of colour cycling fractal and Mandelbrot pictures to discos. Can you imagine looking to the latest House hit while hooked at huge screens pulsating with Mandelbrot plots? Chris can, and he reckons there's a market for it.

Chris Lloyd: inspired by Mandelbrot plots.



GO FORTH AND CREATE LAND

Two of the programs used to illustrate this article are included on the B side of the Cover Disk: *Mandelshow* and *Fractal Surf*. Both are run by opening the respective folder on the disk and double clicking on either *FRACSURF.PRG* or *MANDSHOW.PRG*.

Mandelshow is a Mandelbrot generator that allows you to zoom in and out of the Mandelbrot set to produce millions of different pictures. Control of the program is achieved by a row of pull-down menus across the top of the screen.

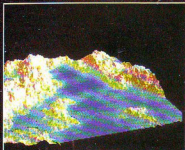
A default Mandelbrot picture is loaded in to start with and other pictures are created from this. You can select the point that you want to be the centre of the new picture easily, letting you gradually zoom in closer and closer to the source of the Mandelbrot. Magnification can be done in steps of $\times 2$, $\times 4$ and $\times 8$.

Pictures can be saved out in *Degas* form or loaded back in later. The position within the Mandelbrot can also be saved and loaded.

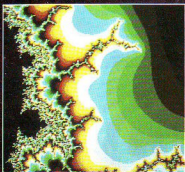
Fractal Surf is random landscape generator. With it you can create random landscapes and then view them from any position on the landscape and also from any angle. Sea level can be altered to change the shape of coastlines and if you run the program in low res you can also change the snow line.

The position of the light source can also be changed, which lets you see the landscape with the sun in apparently different positions.

The seed for the landscape is typed in, so make a note of it if you want to generate the same landscape again. Again, the screen can be saved in *Degas* format.



■ One of the millions of landscapes that can be created with the aid of *Fractal Surf*. The seed was 12245 and the fractal factor 0.8.



■ Delving into the Mandelbrot set can provide you with a multitude of colourful patterns.

dimension of the computer countryside, and so estimate the dimension of the real world.

A very simple landscape modelling program simply draws a line with random ups and downs. It then draws a second line in front of it but this time the points on the line are constrained by those surrounding it, so the random element is controlled. A point cannot differ much from those around it, and the amount and direction of the difference must be similar to the amount the adjacent points differ from their neighbours.

In this way a jagged landscape can be built up, the degree of jaggedness depending on the size of the random element and the degree of constraint exerted by each point's surroundings.

Sophisticated versions of this type of program add colours, sea, snow, and a light source to give shadow. You can change your viewpoint in the landscape and even move around in an animated sequence.

BACK TO NATURE

Computer fractals like the Mandelbrot set have taught mathematicians a great deal about the real world. Nature itself also uses a simple set of initial rules to build up objects ultimately of enormous complexity.

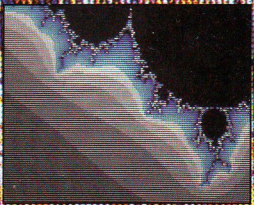
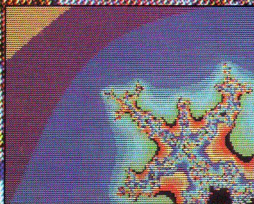
One area where chaos theory could have a major part to play in the future is in the study of biology.

Scientists using computer graphics models, analogous to the Game of Life, have succeeded in reproducing leaf structures which exactly mirror those of the real plant using only two or three very simple rules to build up the picture. This is important because that is exactly how they are built up in the living plant.

Every living thing carries in its cells a complete set of instructions for making a copy of itself. These instructions are held in the DNA of the cell – but they are not a blueprint of the creature. A blueprint is a complete representation of the whole in a miniaturised form, but there is simply not enough DNA in the cell to hold that kind of detail. Instead the DNA provides the rules under which the creature develops.

The rules are relatively elementary – a human's DNA holds about as much information as the *Encyclopaedia Britannica* – given the incredible complexity they give rise to.

The models mathematicians use to study chaos may one day shed light on the mechanisms of how we are what we are. ■



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SCREEN UPDATE

MARK PICKAVANCE dips into his paintbox and draws out the latest releases in the art world.

MORE DRAW

Atari has recently added *HyperDraw*, an object-based drawing package, to its range of *Hyper* productivity titles.

Unlike existing paint packages, *HyperDraw* stores all the elements that make up a complex drawing as objects with a full description of type of object, the position of all relevant parts of the object and the way in which the object is drawn.

The output of a similar drawing produced in a conventional paint package – like *HyperPaint* – would only look as good as the screen representation. In short, not very. The quality of *HyperDraw*'s final output depends on the quality of the device used to produce it.

HyperDraw is a typical GEM program. All editing is done inside a window; options are chosen from pull-down menus and icons situated down the left side of the screen. All resolutions and all STs are supported.

HyperDraw costs £39.99 and is available from Atari at Atari House, Railway terrace, Slough (0734 33344).

MINI GRAPHICS

Presentation Graphics is the third module, of the planned four, to appear in Database's *Mini Office* series. Data can be exchanged between the previously-released Spreadsheet module and Presentation Graphics.

Up to 10 data files can be held in memory at once, which can be turned into graphical representations. Five graph types are supported including line, bar, pie and scatter plots. Comprehensive art tools make it possible to jazz up the screens. There's also a slideshow utility for sequencing the images created.

Presentation Graphics costs £24.95 – the same as the other modules in the series. It's available from Database Software, Database Direct, Freepost, Ellesmere Port, South Wirral, L65 3EB (051 3572961).

CAD NO!

BeckerCAD is the latest software release from prolific book publisher Abacus. Features include polygon drawing with any number of sides, freehand drawing, automatic line



Hyperdraw – latest addition to Atari's Hyper series.

measurement, definable grid, multiple line widths, trim, divide, zoom and undo.

Multiple GDOS fonts and a font editor are provided. Plotters and most types of printer are supported. Atari's laser and PostScript-compatible lasers can be used.

Adamssoft at 18 Norwich Ave, Rochdale, Lancs, OL11 5JZ (0706 524304) will be distributing *BeckerCAD*, but as yet has there is no UK price. US price is \$395.

'O' ZONE FRIENDLY

Signa Publications will be supplying all *Calamus* users with a free upgrade including the *DMC Outline Font* editor. The font editor operates as a desk accessory, and is designed specifically for use with *Calamus*. It uses the trace technique, first seen in *Adobe Illustrator* on the Mac. To create an outline version of a graphic or font you first scan the original artwork.

The scanned picture is then used as a guide to placing your lines and bezier curves etc. You can also edit the DMC fonts supplied with *Calamus*, but not the *Compu-graphic* fonts which are encrypted.

If *Signa* hadn't been busy enough this month it has also announced *DMC O-Line*, another support program for *Calamus*. This one is designed to manipulate the outline fonts used in *Calamus*, including the ones you have created with the font editor. Amongst other things it can also raytrace and make text follow any curve. I promise more information (gosh, even reviews) when *Signa* releases *DMC Outline Font* Editor and *DMC O-Line*.

PARSEC HAS COME A LONG WAY

It is over 18 months since the *Parsec* board first appeared in the press and then at the Atari User Show in April last year.

Most people (including myself) were under the impression that the *Parsec* graphics board had gone the way of the Enterprise and the Oric. But Elmtch Research has now gone as far as demonstrating finished circuit boards – no boxes yet though.

The *Parsec* is based on a Texas instruments dedicated 32-bit graphics processor and is rated at 6.5 MIPS. The *Parsec* will start at £920 inc. For that you get 768k of video ram and a display of 1024 x 768, with 16 colours per scan line from a palette of 4096. This can be expanded to 4 megabytes, giving 256 colours per horizontal line from a 'true colour' 16.7 million selection.

All the *Parsec* needs now is some software and a box, though by the time that happens I understand that they might have some strong competition in the add-on graphics department. More on that when it happens.

INTO THE LIMELIGHT

Have you ever been drawn into a pointless discussion as to which is the better computer – the ST or Amiga?

The basis of any Amiga owner's argument would be that his machine has more sophisticated graphics, enabling it to show more colours in a higher resolution. He might illustrate the point by showing you an attractive raytrace in the special HAM (Hold and Modify) mode – very nice. Until recently the argument might have ended there, but GFA Raytrace will change all that.

512 colour raytracing – beating the Amiga at its own game courtesy of GFA Raytrace.

means that you cannot edit Raytrace images in Spectrum 512, or any other paint package for that matter.

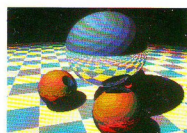
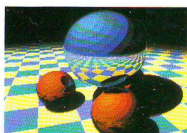
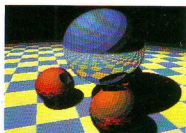
The Raytrace system is supplied on two disks with a 135-page manual. The disks contain the main program, two animation utilities, a example of GFA BASIC which displays still images. Some example

The editor enables you to create a scene with primitive objects and position them together with lamps, the floor and horizon. After construction, a scene can be brought to life with Animate. Any element within the scene may be moved or have its attributes changed. This includes lamps and even the floor.

After the desired animation has

gles and cones etc. In addition, the precise colour and texture of each primitive can be specified. The options include dull, bright, mirrored and relief.

As well as a colour and texture, an object may also have a texture map – a Degas, Neo (who uses NeoChrome these days?), GFA Artist or Spectrum 512 image can be loaded into memory and then projected onto the surface of any object. This feature is also implemented on the floor and sky, enabling sunsets to be pre-drawn and carpets already patterned.



■ Frames from a 512-colour raytraced animation. You need draw only the first and last images – the rest are made by the machine.

Special-mode paint packages have been around for a while. Quantum Paint was the first, followed by the impressive Spectrum 512 and then GFA Artist. In hindsight it was obvious that somebody would see the animation possibilities and produce a program that would enable special mode graphics to move.

The special mode used in GFA Raytrace is similar to that used in Spectrum 512. All 512 colours in the ST's palette are available, the only restriction being a limit of 48 per horizontal line. Though the technique is similar the format is different, which unfortunately

objects and scenes which are used within a tutorial contained within the manual.

Before running Raytrace it is necessary to 'sync' the machine. This means executing a program which sets up the required interrupts. Two small programmes are supplied which do this to produce the special mode in either 50 or 60hz. The 50hz sync is supplied for those people who only have TVs and not colour monitors.

PRIMITIVE BEGINNINGS

Once sync is achieved Raytrace is simplicity itself. The functions are divided across three main areas.

been tested in wire-frame the final part of the operation is accomplished in the raytrace department where your scene is rendered in glorious technocolour, or 512 colours, at least.

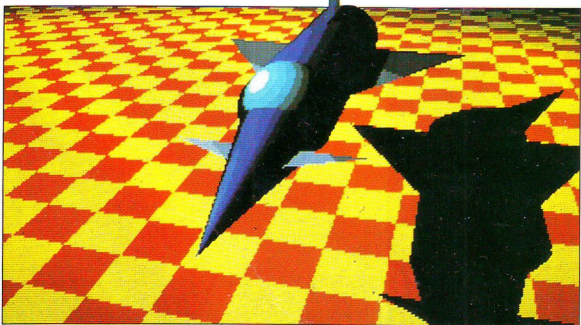
SURFACE DETAILS

The 3D editor is not totally unlike CAD 2.0 in appearance – the scene is viewed from three sides and the observer's location. It is within the three standard views that you can draw your primitives, the building blocks from which, with patience, it is possible to construct almost any object you wish. These include spheres, cylinders, trian-

Once defined, an object can be moved, re-coloured or re-textured, though not rotated or cloned (shame). You are restricted to producing your scene in a somewhat inflexible way. The only option open to you if a primitive is either the wrong size or orientation is to erase it.

A valuable feature is the ability to run Raytrace in mono, reload your scene in colour and then raytrace. You'll find this much easier to do this than define scenes in medium resolution.

When raytracing in mono you can select one of nine grey shades for objects. Results are impressive



■ Any element with the scene can be moved or have its attributes changed – including lamps and even the floor.

FORMAT RATINGS

Features 73%

Powerful raytrace algorithm but limited user interface.

Speed 85%

Fast – written in GFA BASIC with assembler subroutines.

Ease of Use 80%

Initially complex, but with excellent tutorial files.

Results 93%

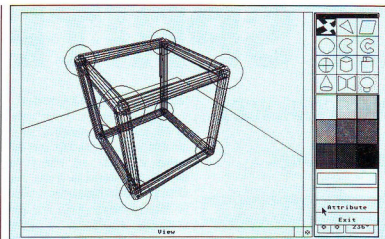
Superb 512-colour 3D images.

Format Value 78%

Expensive, but nothing else comes close.

The Competition

Amic's Cyber Studio at £79.95 (Electric Distribution, 0480 496666) offers very basic raytracing facilities.



■ Raytrace's 3D editor: the scene is viewed from three sides and from the observer's position.

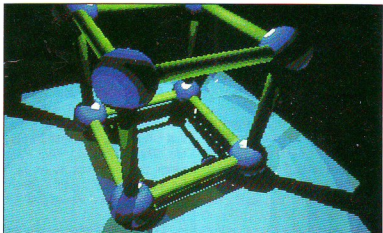
even without colour. The Animation facilities are simple to use; you dictate a start and end position for the scene and the frames are 'betweened' (or created) for you.

This makes for fast animation but serious limitations. All motion is linear, and you cannot make objects move in anything other than straight lines. This problem extends to lamps and the observer - who cannot fly around a scene but only through it. This is the least successful part of the package. Even the ability to set up each frame in a manual way would have been better than the totally automatic system employed.

only software on the ST with a horizontally split resolution: low 512 colours on the left and medium four colour on the right. In raytracing terms this package is fast, though if you set up a 10 frame animation it's best to let it run overnight.

VERDICT

This package is both exciting and depressing. It produces some of the most incredible ST images you'll ever see, but you cannot print them out or port them across to any other software yet. It has the potential for becoming an amazing animation tool, though it



■ A full screen image takes anywhere between 40 minutes and an hour to produce.

TIME TO RUN

The length of time for each image is dependant on the complexity of the scene. It takes between 40 minutes and an hour to produce a full screen.

The Raytrace menu enables you to plot smaller than full-screen images which take only minutes to render. This is useful when you want to test a scene before committing yourself to a full screen or animation. You can also restrict the colours to 64, 128, 256 or use the full 512.

The menu selection is down the right hand side, while the current image is on the left. This is the

may take PD or third party software to exploit all that Raytrace has to offer. At £49.95 the system must be considered good value for money.

GFA Raytrace
 £49.95 ■ All STs ■ GFA,
 Box 121,
 Wokingham,
 Berkshire RG11 9LP
 (0734 794941)

NB: ST Format readers can take advantage of a special offer on Raytrace - see the Format special offers starting on page 125.

DIGITAL SCENE SIMULATION

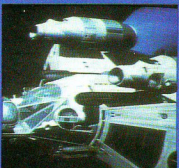
To complement the GFA Raytrace preview we look at heavy duty computations - *The Last Starfighter*.

If the images created by GFA Raytrace are at one end of a spectrum, then those generated for the film *The Last Starfighter* are at the other. It can no longer be described as state of the art, but it was a major step in Digital Scene Simulation. Until then nobody in the film industry had believed that DSS could replace conventional effects miniatures.

In 1981 Lorimar entered into a \$3m agreement with Digital Productions to generate over 25 minutes of cinema effects. The advantages of using computer graphics for creating space battles were numerous; having created the shape and configuration for a vessel, that ship or variants can be easily duplicated as many times as required. All this without a single travelling matt or optical printer in sight.

RASTER VARIANTS

From the very beginning Digital wanted *The Last Starfighter* to be a showcase for the company and its techniques. They chose the largest raster and most powerful computer they could find. A 'raster' is memory map which is scanned by the video hardware to



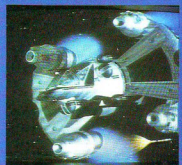
6000 pixels, each with 32 bits (four bytes each pixel), was used. Before you all get your calculators out, this is an image of 9.15 megabytes, or three thousand times bigger than the humble ST.

CRAY DAYS

For each frame, approximately 7.2 billion computations were needed to provide essential images - features such as shadows, reflections, multiple light sources, texture mapping and transparency. The most effective computing engine available at the time was the CRAY XMP, which had a throughput of 160 MIPS (million instructions per second). This may not seem that powerful when you consider what is currently in use, but at least they were 64-bit instructions. Using 100% of its effort, the CRAY took about a minute and a half to produce a single frame. Using the latest technology the output would be over 8 frames per second.

Much of the effort at Digital went into encoding the objects - the Gunstar was then the most complex object ever encoded, with over 600,000 facets. One shot required there to be 10 Gunstars in an underground hanger. This still rates as the most complex scene ever raytraced.

Since *The Last Starfighter* the technology of computer graphics has moved on, but as a milestone of Digital Scene Simulation, *The Last Starfighter* still stands alone in scale and ambition.



produce an image. On the ST the 'raster' is 32K in size and gives a display of 320 x 200 (using four bits for each pixel).

The one used for *The Last Starfighter* had to have an aspect ratio of 2.35, which is the format of CinemaScope 35mm film. To facilitate this, a raster of 4000 x

LET'S TALK SPRITE

Many of you may have considered designing or creating a game. Unless you are a considering 3D you will be dealing with the basic components of most games, namely sprites.

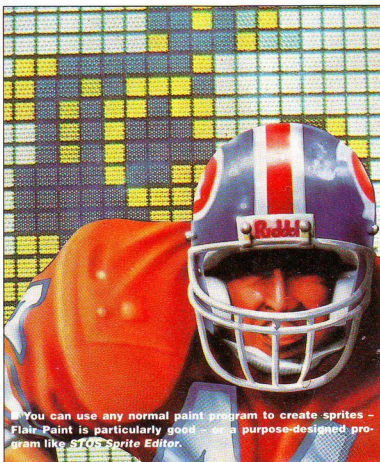
The design of sprites is a key element of game design, but first you should consider the best environment for completing a game project. If you are producing the graphics you're strongly recommend to teaming up with a programming friend. A great deal of work is involved in producing a game, and being able to co-operate with an "understanding" programmer is half the battle.

LAYOUT

After you have decided what type of game you are going to tackle, it's best to plan out the entire design on paper. This may seem a little low-tech, but if you are designing a scrolling game it's much better to be able to see the whole layout at once. You should start thinking in a modular way right from the start - your background should be constructed from tiles of a set size. The sizes that you should be considering should be 16 by 16 or 32 by 32 pixels. These are the sorts of considerations that your programmer will appreciate, as he has to bind all your pretty pictures into working code.

A good approach to drawing these tiles is to make a blank screen with a 16 by 16 grid on it,

Some advice from MARK PICKAVANCE to get you started in sprite design.



You can use any normal paint program to create sprites - Flair Paint is particularly good - or a purpose-designed program like STS's Sprite Editor.

then all the elements will be 'word aligned' when completed.

To understand word alignment you first have to grasp how the ST's screen memory is arranged.

INTERLEAVED?

You will be. In the 16-colour mode four bits are allocated to each pixel. The obvious way to organise this would have been to put two pixels in each byte and put one in the high nibble and one in the low. Atari is not that sort of company. The bits are interleaved (eek!).

First 16 pixels on the screen are interleaved over four bytes.

As you can see from the diagram, the four words (16-bit words - two bytes) represent the four planes that 16-colour graphics offer. Don't get confused with the actual colours on the screen, just accept that the ST has colours 0 to 15 - what they are set to is irrelevant.

Each colour has four bits, one in each plane/word. If the colour chosen is between 0 and 3 then planes three and four are not

required to store that information.

The advantages of not using all 16 colours to design a sprite are that you only need to save the planes you use, and writing the data to the screen is faster. And when placed on the screen it takes up less processor time. The programming advantages of using only four or eight colours for sprites are enormous.

The purpose of all this explaining is so that when your programmer starts saying "the background can only be in two planes because I have to scroll it", you don't give him a blank stare and then waste lots of time creating wonderful 16-colour backgrounds that can't be used.

TOOLS OF THE TRADE

Before you create any graphics agree as to what format your data is going to be in - Degas screens, for example. This means the programmer can write utilities to cut your sprites off the screens and save them in a form more suited to his requirements. The format you choose will reflect what pixel editing program you like the most, but don't use a compressed format because the programmer will have to un-compress the data before he can utilise it.

Almost any paint program will do for producing your sprites. What is most important is that you feel confident while using it and that it is reliable. Amongst the best are Degas Elite and Flair Paint which, as Flair works as an ACC file, can be used together. Other prefer Cyber Paint or even OCP Art Studio.

One excellent alternative is the STOS sprite editor - this has the advantage that if you don't like the features you can always re-write them to suit you, as it is written in STOS.

FORMAT CORNER

How many graphics formats do you know? Which do you use? Which would you rather? For a forthcoming *Format 1* I am trying to compile the ultimate chart to show what software will accept and convert which image formats.

What I need is information about any converters that you may have written or used. As an example, does any body know of a utility to convert *Spectrum 512* to IFF? Write to me at *ST Format* and keep me informed.

Also, if you have any problems to do with art packages in particular or graphics in general, drop me a line and I'll do my best to help you out. And if you've got useful tips, pokes or hints, I want to hear from you - there are free subs going for the best!

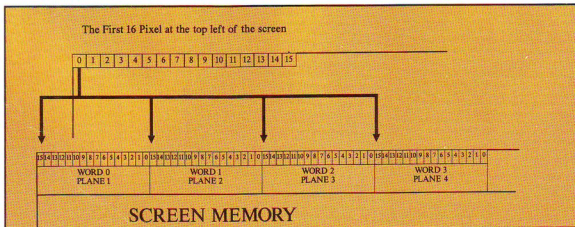


Diagram showing how the ST's screen memory is arranged.

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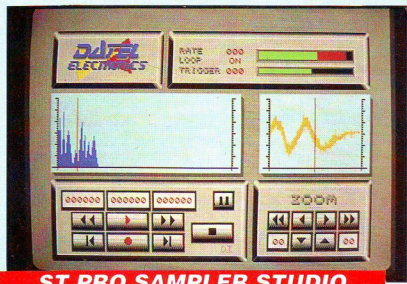
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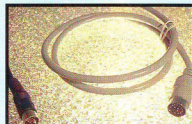
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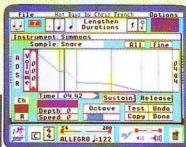
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Powerplay, top joystick manufacturer, is offering this brilliant prize, which also includes a monochrome SM124 monitor. These two between them would cost around £700 from a dealer, but they're free to the first correct entry out of the *Format* hat.

Also, 20 runners-up will each receive a Powerplay joystick, ranging from the Turbo Crystal Clear to the Standard Crystal model.

The Mega ST1 is basically a 1040ST in a Mega case. Not only do you get a blitter chip as standard, though, you also get the high-quality remote keyboard of the Mega range.

To enter, jot down the answers the following three questions on a postcard, and send it to MEGA COMPETITION, ST FORMAT, FUTURE PUBLISHING, 4 QUEEN STREET, BATH BA1 1EJ. Closing date is 21st October 1989 – so get those entries in!

QUESTIONS

1. Who patented the industry-standard 9-pin joystick connector?

- a) Atari
- b) Amstrad
- c) Massey Ferguson

2. What was Powerplay's first joystick called?

- a) Cruncher
- b) Chopstick
- c) Cruiser

3. How many hands do you need to operate a hand-held joystick?

- a) 1
- b) 2
- c) 3

RULES

1. Entries must be in by 21st October 1989. Any postcard that arrive later will be kicked into a corner and buried in rubble when the offices are demolished in 300 years time.

2. Employees of Future Publishing, Powerplay and Atari may not enter. If they do we'll send the boys round.

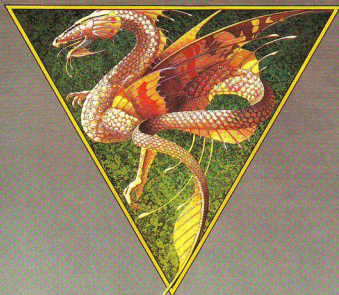
3. The editor's decision is final and no correspondence will be entered into. If you phone up to complain we'll all be very quiet and pretend there's none in the office.

ATARI

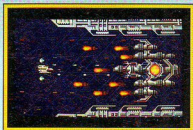


THE BEST OF THE BEST

T'R I A 'D



V O L U M E • 2



ST Amiga Format - Gold Disk Award

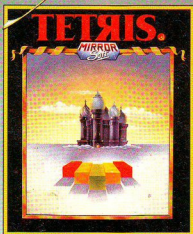
"Menace will have you hooked for hours on end. The addictive 'just one more game' feeling hits you every time."

ST Action

"This game is non-stop action all the way - miss it at your peril."

Page 6

"Menace is a superb game which is impressively presented. Menace excels in terms of playability. It is a highly addictive game with enough variety for you to keep wanting to come back for more."



Sinclair User - 10

"The most original and playable game in an age."

Atari ST User - 9

"Tetris is one of those horribly addictive games that gets you saying 'Just one more game'."

Zzap - 94%

"One of the all-time computer classics . . . it's perfectly simple and simply perfect."



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Atari ST User - Star Game

"What a brilliant game - surely Psygnosis' best to date? The graphics have to be seen to be believed and the scrolling is excellent."

ST Action

"A brilliant mixture of fine artwork, taxing strategy and all out arcade action, this game will really put you on the edge of your seat."



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Beam Saber 77	27.55	Football Manager 2	13.95	Manhunter Dealers	18.90	Skate Off Art	14.90	Turbo GT	11.90	Xenon II	15.90
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MAKING TRACKS

Keep a tight rein on your disk drive's head with PETER SPRAGG's £25 tracker device.

Have you ever wondered what your disk drive is doing when accessing a disk, or tried to copy your favorite disk only to find the drive hangs on a certain track after you copied it? Well here's the answer, an add-on disk drive track display for the ST, or in fact any micro that has an external disk drive port.

The display shows which track the drive head is currently on, and also shows which side of the disk it is accessing. This is shown by the two decimal points in the display lighting up, on for side 1, and turning off for side 0.

The circuit is fast enough to keep up with any speed of drive, and automatically resets itself whenever the drive is stepped to track zero, ensuring the correct track number is always displayed.

As stated before, the circuit will work with any micro that has an external drive port. Just make sure you get the correct lines from the board connected to the right pins on the computer. (See the connection diagram for details).

Details of the circuit board are shown in the main diagram - if you

have bought the kit then you only have to identify the parts and insert them into their correct holes in the board and solder them into place.

There are a lot of unused areas on the board because the circuit detailed here is designed to work on the Amiga. However the design will not directly work on the

Amiga as additional chips and links are required to set up the correct control logic. Details of this track displayer will be published in *Amiga Format*, so tell your friends with Amigas to keep an eye out!

DISPLAY DRIVER

The circuit is made up of a display driver chip which takes care of

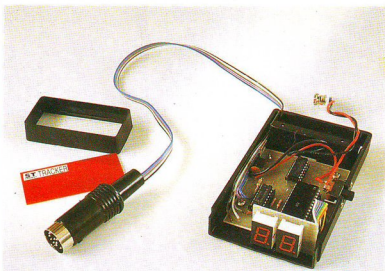
turning the signals from the computer into the correct numbers. This converts the signals from the driver chip into the numbers that are displayed. The control lines are processed by two logic gates before being fed into the driver chip.

Power for the circuit is provided by a nine-volt PP3 type battery, as no external power is supplied on the ST's external drive port.

The circuit actually requires a five-volt supply, which is fed from the nine-volt battery and then dropped down to five volts by resistor R4.

BUILDING UP

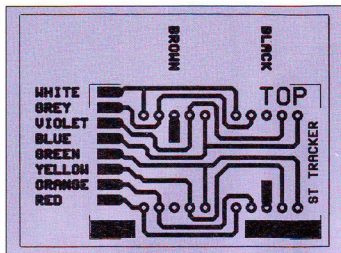
It is best to start soldering the wire links into place first, there are three of these which can be made up from thin gauge tinned copper wire or the cut off legs from components (make sure the parts you cut the legs off will still fit through the board first). Next take the resistors and bend their legs 90 degrees to the body and insert these into their correct places on the board. It doesn't matter which



■ ST Tracker in completed form. The main PCB can be seen attached to the base, with the display board mounted vertically behind the LED display.

PROBLEMS, PROBLEMS

If you have difficulty with the tracker, and it stubbornly refuses to obey your commands, Magenta Electronics offers a help and repair service. Send your helpless device to Tracker Repairs, Magenta Electronics, 135 Hunter Street, Burton-on-Trent DE14 2ST enclosing a cheque for £6.00, which includes handling, postage and packing.



■ The ST Tracker displaying board, showing connection points for the different coloured wires.

way round these go, but be sure to get R4 in its correct place. The capacitors can be soldered into position next, these too can also be inserted either way round. All components are placed into the board from the plain side and soldered to the tracks on the other side. With the components in place, snip off excess wire sticking through the board.

Now you're ready to solder the ICs into place. Make sure these are in the correct places and inserted the correct way round into the board before starting to solder. Don't get these too hot, or you will damage them, just apply a little solder to each of the legs in turn. A small indentation or a dot in the top of the chip shows which way round they go. They should all be facing the right hand side of the board. (The top of the board has the connections to the 14-pin plug on it.) The use of the IC sockets is recommended - supplied in the kit. Next take

the displays and place into the board the correct way round and solder into place. The decimal points should face the bottom of the circuit board.

Soldering components into place takes a little practice. First place the component you are going to solder into the board and bend the legs very slightly to stop it falling out again. Next turn the board over so the tracks face you and place the board on a flat surface. A piece of paper on the bench helps to stop the board slipping around when soldering. Now tin the end of your soldering iron with a little bit of solder, just enough to make the end wet, and place the tip onto the track and component lead you are going to solder. Slowly feed some solder onto the iron tip, so that it melts onto the track and leg to form a joint. Good solder joints should be shiny and have a mound-like appearance to them, dull joints, or a blob mean that you have

GETTING THE PARTS

To make life easy for you we have arranged with Magenta Electronics to supply kits with all the parts you'll need to build the Tracker.

The kits cost £25.75 and you can get one by sending a cheque to ST Format Tracker, Magenta Electronics, 135 Hunter Street, Burton-on-Trent DE14 2ST, or ring 0283 65435 with your credit card details. Alternatively, those of a nervous disposition can purchase the device fully assembled and tested for £31.75 from the same address.

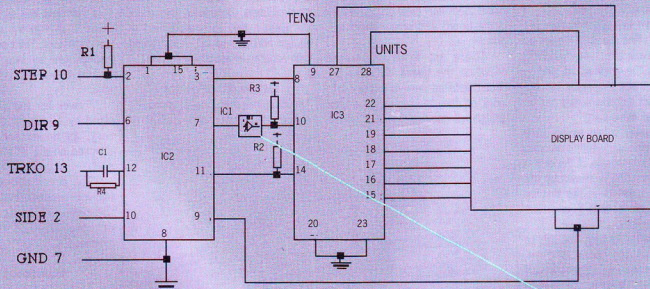
created a dry joint, and proper electrical contact will not be made. It takes some practice to get good results, so try soldering some wires together first.

WIRING UP

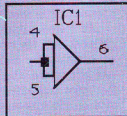
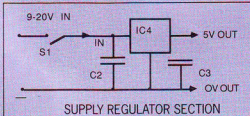
Now you're ready to start joining the wires from the board to the computer. Take a piece of five-way ribbon cable around 300mm long and separate the strands at both ends by about 20mm. Strip each strand by 5mm and gently twist them to prevent them from fraying. Melt a little solder onto each of the strands to make sure they don't come apart, then snip off any lumps that collect on the ends. Do this at both ends.

Now take the 14-pin connector and solder one of the cores of the ribbon cable to each of the pins as indicated in the diagram. Multi-coloured ribbon cable is used because it lessens the chance of getting any of the cores swapped over

CIRCUIT DIAGRAM FOR ATARI ST DISK TRACKER



POSITIVE IC1 PIN 14
IC2 PIN 16
IC3 PIN 24
GROUND IC1 PIN 7
IC3 PIN 8
IC3 PINS 20, 23



■ The circuit diagram and PCB layout for the tracker.

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Demons Winter	15.99	24.99
Darkside	15.99	24.99

	Member	RRP
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Falcon Mission Disk	12.99	19.99
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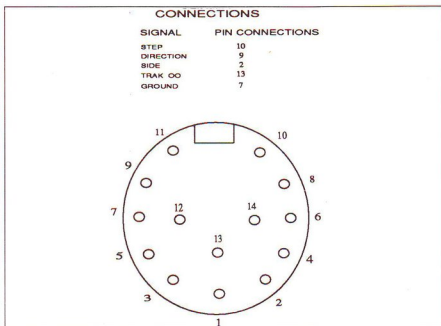
Software £1 post & packaging within the UK and EEC, Non EEC £3 Hardware and Courier Service £6.

FOR SALE

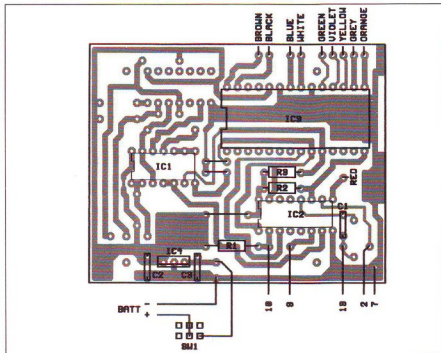
Magenta Electronics is still selling the speech synthesiser kit from *ST Amiga Format* issue 8 and the sound sampler from issue 11. The speech synthesiser (kit form only) is £29.95 and the sampler kit £22 (£28 fully assembled & tested). Contact Magenta on 0283 65435 for more details.

TRACKER CHECKER

On side 1 of this month's Cover Disk you'll find a program written to check your Tracker device is functioning correctly. Called TRACKER.PRG, the program also works for external drives.



■ The connections for the disk drive plug, looking towards the computer.



■ A diagram of the PCB showing the location of the principal components.

PARTS LIST

Ref	Description	Identification
R1, R2, R3	1K resistor	Brown Black Red Gold
C1	47pF capacitor	Small square body marked 47
C2, C3	100nF capacitor	Small brown disc marked 104
IC1	74LS00 TTL IC	14 pin marked 74LS00 and other numbers (batch, date code etc)
IC2	74LS367 TTL IC	16 pin marked 74LS367 etc
IC3	ICM7217 CMOS IC	28 pin marked 7217 etc
IC4	7805 Regulator	3 pin device with metal tab
DS1, DS2	7 SEG.CA Display	Note that the display is the right way up when the decimal point is bottom right
PL1	14 pin plug	Disk drive connector
S1	Slide switch	Connect battery + to both centre pins and use any corner pin to connect from switch to board

Miscellaneous components:

Main and display printed circuit boards ref K818, PP3 battery clip, sockets for ICs 14, 16 and 28 pin, coloured ribbon cable - 0.5m of 5 way, and 10cm of 10 way, Case, red display panel, 2 M4 screws and nuts for slide switch, 4 small self tapping screws to mount printed circuit board.

Optional: Plug-in power supply £3.95

when connecting the plug to the board. It is best to apply a little solder to each of the pins that you are going to solder onto before starting, as this will give the wire something to join onto.

When all is done, double check for shorts between the pins and, if all is OK, you're ready to start soldering the other end into the circuit board. Note which colours you've soldered to the pins in the connector, so you connect the correct lines to the circuit board. It is very important that these go to their correct places on the board, so double check them.

Next you will have to solder the battery connector into place, making sure the red lead goes to the positive sign on the board. And also solder in the on-off switch, two short pieces of cable approx 75mm long can be used for this. Attach one piece to the centre pin of the switch and the other to any of the outer ones.

An external power supply can be bought in any popular high street electrical store. But do make sure the supply is nine volts DC. The connections for this modification are shown in the illustration.

TESTING TIME

When all the connections have been made, and all the components are soldered into place, check the unit over one last time to make sure there are no shorts, and that all the components are in the correct places and if all is OK, then it's time to test the tracker. Turn off your computer and the tracker and insert the plug into the drive socket on the rear of the ST. Turn on the tracker. The display will light up, probably showing a random number! If random LEDs are lit up, in other words if numbers are not shown, then something is wrong and the unit should be turned off immediately and the circuit checked.

If all is alright, then turn on the computer, the display will flash numbers, and then stop and read 00. Insert a disk into the drive and the display will change numbers to show which track and side the disk drive is currently accessing. When you have finished using the tracker, power the computer off first, and then the tracker. Be careful not to leave the tracker turned on, as this will run the battery down. ■

CONTROL LINES

If you wonder what the control lines for this project are, or you wish to connect to another micro, here's a simple explanation.

STEP This line is pulsed low to step the head in the direction determined by the DIR signal.

DIR Direction of travel of the disk head, low to seek towards the centre of the disk and high for the outer.

SIDE Determines which side of the disk is being accessed, low for the upper side and high for the lower.

TRAK00 This line is taken low by the disk drive when its head is positioned on track 00.

STRYX



- ★ **Ultra smooth 8 way scrolling**
- ★ **Designed with small fully animated characters from Garvan Corbett, the artist who brought you the classic hit Barbarian**
- ★ **Multi-directional free format weapon usage**
- ★ **Large playfield for even more action.**

You're really up against it this time. Those revolting robots have finally upped and turned their horribly powerful weapons on their kind human masters. Someone's got to stop it before it all gets out of hand. I mean, you just can't have bloodthirsty Cyborg assassins roaming the streets of Dome City and expect the citizens to put up with it. Who on earth is going to sort out the mess? You guessed - you get the job.

Fortunately, you are just a little bit on the special side. You are Stryx, the product of Project Alpha Secure, the meanest fighting, smartest thinking machine ever invented. Half-man, half-robot, you are the business, the only one who can stop those wicked Cyborgs.

You'll have to work hard, though, blasting hordes of the revolting creatures (such a sad waste of scrap metal) and rescuing the keys to the Lifeforce.

So, Stryx, you'd better get your jet pack on for some high level robot stomping through the immensely complex underground world of the Dome cities. It's a tough assignment, and time is running out.

AMIGA/ATARI ST £19.95

Screen Shots from the Atari ST Version

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STEP ON IT!

If you've ever cursed your ST for its slow re-drawing of windows, or wanted that extra burst of speed when doing complex calculations then you'll probably be interested in Third Coast's latest German import, Hypercache.

Hypercache is a 16MHz 68000 processor that sits inside your ST and can work on data at twice the speed because the processor runs at double the speed of the standard ST - which has a humble 8 MHz processor.

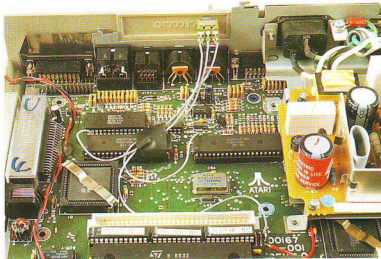
INSTALLATION

The first problem that you'll have with Hypercache is getting it installed, because you have to open up your ST and then go searching for a soldering iron to remove the old 8MHz 68000 and solder a wire or two.

Only one of the wires to be soldered is essential; the other is only needed if you want to be able to turn off the RAM cache. More on the cache later.

If you have as much faith in your soldering skills as we do in ours then you'll get a professional to do it. Third Coast will be offering a fitting service for purchasers.

GARY BARRETT tries to keep up with his new Hypercache accelerator board

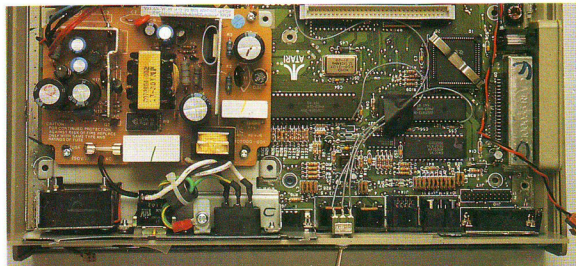


■ A switch can be fitted if desired to let you swap between 8MHz and 16MHz modes.

CACHING IN

Speed increase with Hypercache installed is only 10% to 20% with the RAM cache switched off. The RAM cache consists of 8K of fast RAM chips. What happens is that all data written to the main RAM is

also written to the fast RAM. Data in the fast RAM can be processed by the 16MHz chip very quickly and gives considerable speed increases over a standard ST - over 90% on some tasks and averaging out at about 60% to 70%.



■ Installing Hypercache requires some soldering so if in doubt get it done by a dealer.

SPEED TEST

Test	Standard Mega ST	Hypercache	Blitter	% Increase
N*N for n=1 to 10000	3.52s	1.98s	no	77.78%
Printing a shape 100 times	10.17s	5.90s	no	72.37%
Filling rectangles	3.83s	2.01s	no	90.55%
N*N for n=1 to 10000	3.52s	1.98s	yes	77.78%
Printing a shape 100 times	2.79s	2.41s	yes	15.77%
Filling rectangles	3.79s	2.40s	yes	57.92%
Mandleshov program	1055s	571s	no	84.76%

WHY ARE WE WAITING?

Why should you want Hypercache? Well it depends really what you want use your ST for. A lot of games software will run faster, but since not reacting fast enough is often the cause of untimely deaths you'll just achieve game over sooner.

Where the board is at its best though is in desktop publishing and computer aided design. DTP and CAD programs tend to run slowly and involve lots of calculations and so this is where the extra processor speed really shows up.

Spectre 128, the Macintosh emulator for the ST, also works with Third Coast's processor and the speed increase is very noticeable. Sound really slows down Spectre on a standard ST, but with Hypercache fitted it works perfectly.

HYPERCASH

At £150 Hypercache may not be cheap and for someone that just uses their ST for games it's not really worth the cash. Serious users of their ST will find it useful however, especially with DTP, CAD and Spectre 128. ■

HYPERCACHE

£149.00 ■ All STs ■
Third Coast Technologies,
Unit 8, Bradley Hall
Trading Estate, Standish,
Wigan WN6 0XQ
(0257 426464)

FORMAT RATINGS

Features 80%
RAM cache toggle only. No 8/16MHz switch.

Speed 72%
Improves speed of programs by 20.90%.

Ease of Use 63%
Simple to use, but installation of the chip is tricky.

Results 76%
Substantial speed increase and full compatibility with software tested.

Format Value 79%
Price puts it out of the range of many people, but very useful if you use your ST in a work environment.

The Competition

Turbo 16: identical processor, 32K cache, £299 from FAST Technology (0734 784933) - not yet reviewed.

THIRD COAST ATARI HARD DRIVES & TAPE BACK - UP DEVICES

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Atari SLM 804 Printer.....	1217.00

155 M/BYTE TAPE BACK-UP FOR ATARI ST COMPLETE HARD DRIVE RANGE

Compatible with Atari SH204/205, Megafile 20/30/60, Third Coast Drive, Supra Drive, Cumana Drive Backs up 155mb in 20 minutes, 20mb in 2 minutes

- * External enclosure off DMA IN/OUT
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- * SCSI ID selector
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- * Offers long awaited DMA output for Atari SH204 users wishing to connect to laser printer

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PUBLIC SPEAKING

The best things in life are free – or so they say. **ROD LAWTON**

plunders more piles of public domain software and discovers much that is better than some commercial offerings.

Free software sounds too good to be true, doesn't it? Yet there is out there a huge body of public domain software – software that can be freely copied and distributed – literally. The only cash you pay out when you send off to a PD library is for handling, postage and packing.

Libraries will return faulty disks but you should note that, since you're not actually paying anything for the programs yourself, PD libraries are not responsible for faulty programming or bugged code.

For a fuller list of PD libraries, check the box at the end of the section. Most libraries can send you catalogues of what they've got on offer. Here are just a few more examples...

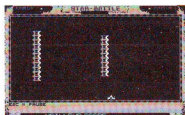


MONEY SPINNER
BUDGIE UK, 5 MINSTER
CLOSE, RAYLEIGH, ESSEX
SS6 8SF

Fruit machine aficionados will love this one, as Money Spinner has got more knobs, symbols and flashing

lights than a 747 flight deck. The inertia of the spinning reels is nicely portrayed and the bandit's arm is quite well animated, even though it makes a sound like a bag of nails in a tumble drier.

★ ★ ★



■ Un bon jeu, vraiment. Et libre, aussi!

variations in alien assailants and attack patterns. And if Electra can sell Better Dead Than Alien, Star Battle deserves to go down a bomb (sorry).

★ ★ ★ ★

THE HISTORY FILE

GAM56 DISKS ■
SOFTVILLE PD ■ £8.00 ■
UNIT 5, STRATFIELD
PARK, ELETTRA AVENUE,
WATERLOOVILLE, HANTS
PO7 7XN

This unusual three-disk outing is a cross between an adventure, a puzzle and an educational program. You have to solve the crime that "shook the village" by first of all collecting information, then sorting it and then reaching a conclusion.

You get full documentation on disk and a teachers' manual can be obtained from the author.

The text is accompanied by rather poorly digitised pictures and interspersed with maps and other diagrams. An interesting product for those who fancy something a little more challenging.

★ ★ ★

SHERLOCK

DISK GD269 ■ £2.50 ■
GOODMAN PD, 16 CONRAD
CLOSE, MEIR HAY ESTATE,
LONGTON, STOKE ON
TRENT, ST3 1SW

Sherlock is an Agatha Christie-style whodunnit game which seems to owe plenty to that old board game classic Cluedo.

Faced with a series of suspects, you have to assemble statements and evidence to deduce the killer's identity.

★ ★ ★

DON'T BE SHY!

Any PD libraries out there we haven't mentioned so far, get in touch – preferably enclosing a catalogue and quoting price details and where people should write to. We're especially interested in new demos/games/utilities appearing on the PD scene – so send those disks in to ST Format, 4 Queen Street, Bath BA1 1EJ.

PUBLISH AND BE SPANKED

KIDIDTP

DISK GD311 ■ £2.50 ■
GOODMAN PD, 16
CONRAD CLOSE, MEIR
HAY ESTATE, LONGTON,
STOKE ON TRENT ST3
1SW

Kidpublisher has to be the world's first desktop publishing program for kids!

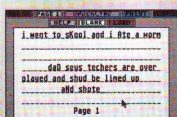
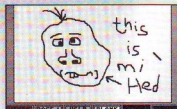
Text input is via nice fat juicy letters, though the keyboard responds more than a little sluggishly, and you can't get many words on the page.

Meanwhile, the graphics screen offers many happy hours of play (even for adults). It can't quite manage 3D raytracing and variable light sourcing, but the simple mouse-controlled brush can still produce masterpieces of

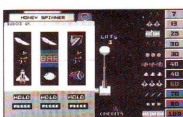
modernist art.

Make sure you get this wonderful little program.

★ ★ ★ ★



■ Kidpublisher: not exactly...er...sophisticated graphics.



STAR BATTLE
GAM05C ■ FLOPPYSHOP
ST ■ 50 STEWART
CRESSENT, NORTHFIELD,
ABERDEEN AB2 5SR

Shoot-'em-ups based on aliens wobbling down in waves is not exactly new stuff, but Star Battle manages to inject some life back in the genre you thought went out with Space Invaders...

The game features some extremely energetic and rapid aliens depositing a definite deluge of destructive...er...bullets.

Demolish one wave and it's on to another, in the usual ongoing orgy of destruction.

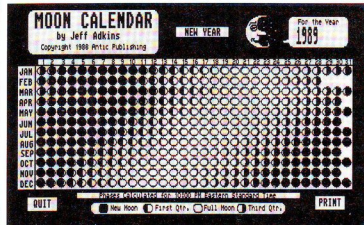
The bullets (missiles?) are a bit feeble, but there are some nice

ONCE IN A BLUE MOON

SKY_MAP/MOON_CAL/SUN_MOON ■ SOUTH WEST SOFTWARE LIBRARY, PO BOX 562, WIMBORNE, DORSET BH21 2YD

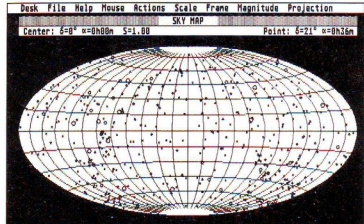
This disk contains three programs, all of which could prove just what the amateur astronomer has been looking for.

Moon Calendar first prompts you for the year, then displays a chart showing the phase of the moon. Very handy for timing those



romantic assignments with Mavis from the chip shop – as well, of course, for planning when to get the old 6" Newtonian out of the garage.

Sky Map needs a mono emulator to run on colour systems, but many PD disks incorporate one as standard. It – not unexpectedly –



draws a map of the night sky, offering many perspective and scale options.

Visually least impressive (and actually most useless) is the Sunrise Sunset program. It asks you for a month, a year and a location and then displays sunrise/sunset times (and moonrise/moonset). It's least useful because the programs are American, and a few of us really want to know when the moon comes up in New Jersey...

★ ★ ★

disk data entry options										
10	06:01	20:01	14:00	07:51	civil	0	68.3	291.2	64.6	13:01:06
11	06:02	19:59	13:57	07:51	nautical	9	68.3	290.8	64.3	13:00:57
12	06:03	19:58	13:55	07:51	astronomical	8	69.3	290.4	64.0	13:00:47
13	06:04	19:57	13:53	07:51		8	69.3	289.9	63.7	13:00:36
14	06:05	19:55	13:50	07:51		8	70.3	289.5	63.4	13:00:24
15	06:06	19:54	13:48	07:51		8	70.3	289.1	63.1	13:00:12
16	06:07	19:52	13:45	07:51		8	71.0	288.7	62.9	13:00:00
17	06:08	19:51	13:43	07:51		8	71.4	288.2	62.4	12:59:47
18	06:09	19:50	13:41	07:51		8	72.1	287.8	62.1	12:59:34
19	06:10	19:49	13:39	07:51		8	72.6	287.3	61.8	12:59:20
20	06:11	19:47	13:36	07:52		8	72.7	286.9	61.5	12:59:06
21	06:12	19:45	13:33	07:52		8	73.2	286.5	61.1	12:58:51
22	06:13	19:44	13:31	07:52		8	73.5	286.0	60.8	12:58:35
23	06:14	19:42	13:29	07:52		8	73.6	285.6	60.5	12:58:19
24	06:15	19:41	13:26	07:52		8	74.0	285.1	60.1	12:58:03
25	06:16	19:39	13:23	07:53		8	75.0	284.6	59.0	12:57:47
26	06:17	19:38	13:21	07:53		8	75.4	284.1	58.4	12:57:30
27	06:18	19:36	13:18	07:53		8	76.0	283.7	58.1	12:57:13
28	06:19	19:34	13:15	07:53		8	76.4	283.2	58.7	12:56:55
29	06:20	19:33	13:13	07:53		8	76.9	282.7	58.4	12:56:37
30	06:21	19:31	13:11	07:54		8	77.2	282.2	58.0	12:56:19
31	06:22	19:30	13:08	07:54		8	77.9	281.8	57.5	12:56:00

NEW YORK NY 40.76N 73.97W hrs dif: -5 AUG 1989 type: SUN

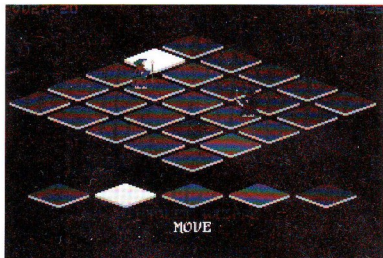
SPECTRAL SORCERY

DISK ST188 ■ £2.95 ■ PAGE 6, PO BOX 54, STAFFORD, ST16 1DR

You can play either against another human or the computer and help screens can be called up at any stage.

★ ★ ★ ★

This is a graphically simple but polished strategy game involving two wizards fighting it out over a board of coloured squares. Squares can each be any one of five colours, and the aim is to covert the whole board to your wizard's colour.



Wizard fun: Spectral Sorcery from Page 6.

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GOODMANS PDL, 16 Conrad Close, Merstrey Estate, Longton, Stoke on Trent ST3 1SW.

LITTLETON PDL, 3 Blacksmiths Close, South Littleton, Evesham, Worcs WR11 5YG

MPH, 10 Chandlers Court, Eaton, Norwich NR4 6EX.

PAGE 6, PO BOX 54, Stafford, ST16 1DR

PARADISE COMPUTERS, 9 Westfield Crescent, Brighton BN1 8JB.

RIVERDENE PDL, 63 Wivringway Way, Purley on Thames, Berks RG8 8BH.

SOFTVILLE PD, Unit 5, Stratfield Park, Waterlooville, Hants PO7 7XN.

SOUTH WEST SOFTWARE LIBRARY, PO BOX 562, Wimborne, Dorset BH21 2YD.

ST UK, 1 Bartholomew Court, Bishops Stortford, Herts CM23 3TP.

THE OTHER PDL, 108 Kenmare Road, Liverpool L15 3HQ.

ST WRITER ELITE WP 12 ■ SOFTVILLE PD UNIT 5, STRATFIELD PARK, WATERLOOVILLE, HANTS PO7 7XN

This versatile word processor has numerous upgrades and full documentation. A click of the left mouse button will change it to a GEM version. Not bad for a freebie, now is it?

★ ★ ★ ★



DISK DIFFICULTIES

PD programs are supplied on disks of three different types: single sided, double-sided, and those requiring 1Mb of RAM. Demos usually need double-sided drives and 1Mb.

Also, some PD games will need other, full-price software to run – STOS games, for example.



WRITE THIS WAY

Looking for a new word processor or text editor? MARK HIGHAM surveys three newcomers to the word processing scene.

Word processors are no new development on the ST. Commercial releases have had a lot to compete with ever since *First Word* was released onto the Public Domain back in the machine's early days.

First Word came armed with a barrage of features from a sophisticated GEM-based environment through to WYSIWYG and advanced page layout commands. And when *First Word Plus* came along a little while later, although no longer a PD program, it added the extra features of spell-checking (now virtually standard) and the ability to import graphics – a facility which the vast number of wordprocessors still don't incorporate.

Three of the latest contenders for number one word/text processor slot are *Regent Word II*, *Templus II* and *That's Write*.

All three use the standard GEM windowing system and pull-down menus as well as short-cut key commands for speed typing.

THAT'S WRITE

£129 ■ All STs ■ Gasteiner Technologies ■ 8 Thornby Gardens, London, N18 2AX
01-803 7880

That's Write is intended as the big brother of all the ST wordprocessors – and it comes with a price to match. It aims to take the useful features out of all the other big boys on the market and pull them together to make a superior package.

For example, it can import graphics (like *First Word Plus*), it handles a range of fonts (like *Microsoft Write*) and it can deal with columns of text and page layouts in a fashion normally only seen within a DTP package.

That's Write is such a massive program that the main files have been ARced to get them onto two disks. Installation is thus required to decompact the files and two extended format disks are essential for this operation. Unfortunately, the installation process has been badly documented, so it's not easy getting things up and running, couple this with an extremely long one-time installation process and you've got yourself a real pain in the neck.

UP AND RUNNING

When you finally get into *That's Write*, the first thing you're likely to do is set up a basic page structure. This is done from within an extended dialog box. A two-character code is assigned to the layout so that you can choose several different page structures and access them by simply recalling the same code. Page length, left and right margins and space for the headers and footers are all decided from this box. Additionally, there's a line separation value which works in the same way as leading in a DTP package. Entries can be made in either cm, picas (1/10-inch) or virtual lines. It's possible to work with multiple columns using *That's Write*, up to a limit of five.

WORDSTAR-COMPATIBLE

Two sets of control keys let you access all the features of *That's Write*. The first set is consistent with *WordStar* and aimed at anyone who enjoys using this popular package (well there's no accounting for taste), whilst the second is *That's Write's* own set – each control code is two digits long. These aren't listed in the drop-down menus, so it takes a while to pick them all up. The control keys also provide access to options which aren't available in the drop-down menus, so it's important to pick them up fast.

What makes *That's Write* particularly appealing is the way paragraph formats can be created and then saved to disk for recalling later. These allow you to define the fonts, text styles and paragraph format (whether justified left, right, full-out or centred). Paragraph styles are assigned to two-character codes in the same way as the page format menu.

FONT CRAZY

To access the different graphic fonts you need to load each one from disk, which can be a painfully annoying way of calling them into memory. However, once in they can be implemented either from within the paragraph style box or by selecting a block of text and choosing the desired font. Text styles such as superscript, bold or underscore can be invoked, although italics can only be used if the font was originally designed with these in mind. Point sizes cannot be changed – which is a real shame.

To let you create your own fonts, *That's Font* comes as part of the deal. It's a sophisticated font designer program which will let you design your font and then perform all sorts of operations on it before saving it to disk.

One of *That's Write's* major assets is the way that a range of fonts can be displayed on screen without using GDOS. It was GDOS which made *Microsoft Write* unbearably slow, so seeing *That's Write* displaying its screen presentation in super-fast time is spell-binding and it certainly makes wordprocessing with graphic fonts more acceptable.

However, one problem with the font display is its on-screen appearance. For some reasons the fonts can look smaller or broader than the printed output. And if certain fonts or text styles cannot be located on disk they are replaced by ordinary text – which can prove frustrating if you don't understand why the output isn't doing what you

PRINTS CHARMING

Print output looks remarkably well-defined when using the extra fonts. Testing with a Star LC 24-10, it produced some excellent results. Particularly handy is the way you can mix the standard printer fonts with the graphic fonts produced by *That's Write*. Headlines, or other important styles, could be produced graphically, whilst the remainder of the text would use the printer's own fonts. This makes printing extremely fast and gives the best possible output.

A few lines from *That's Write* font screen

That's Write has combined both to create perhaps the ultimate style, but is it?

■ Many different fonts can be included in a document but the basic one (shown at the top of the window) is treated as the printer's own internal font when it comes to printing.

TEXT STYLES

All wordprocessors incorporate text, underline and italics. *Orig* couldn't display text in this manner and *That's Write* uses WYSIWYG – a system which may be displayed on screen.

That's Write has progressed output in all sorts of different form majority of printers don't have printed in graphic format so that the characters are literally drawn.

■ Results on a Star LC-24 10 are very impressive. With the printer's own font used as the main body text is much faster output is achieved than with other DTP or graphic font-orientated wordprocessors which offer different fonts.

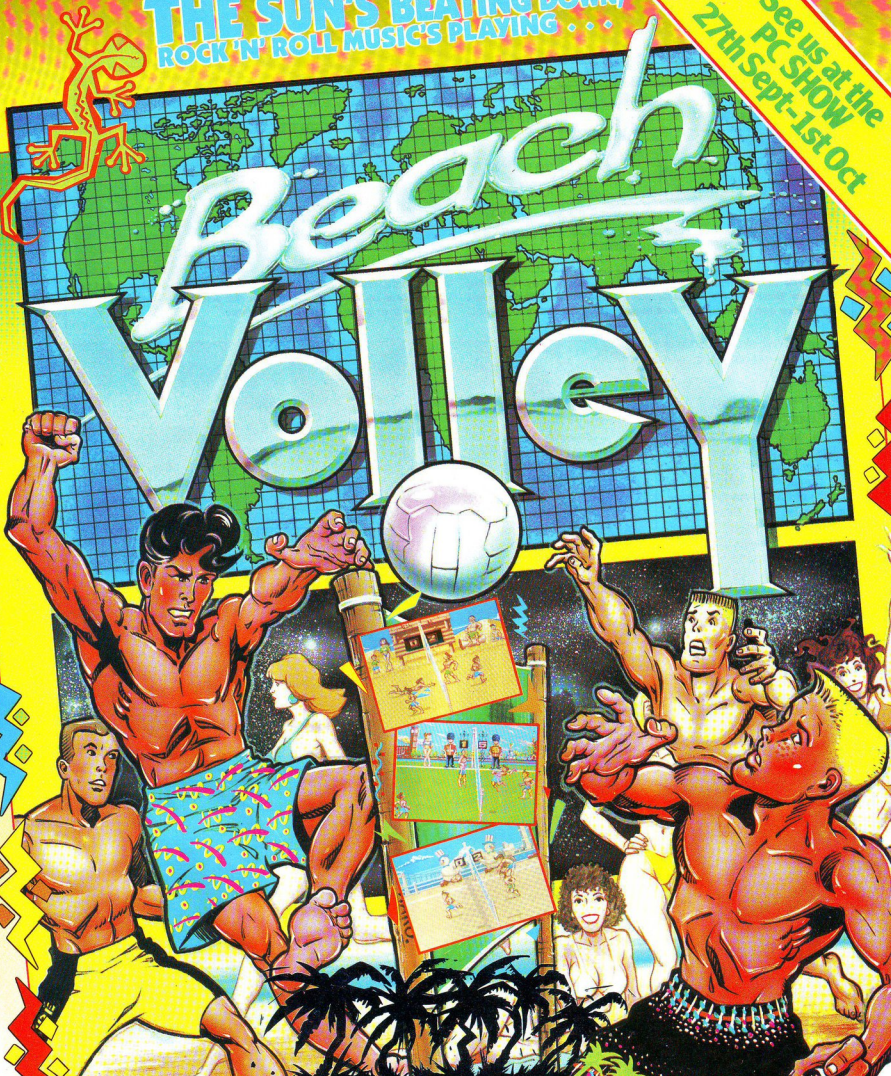
TEXT STYLES

All wordprocessors incorporate text style options to allow you to work with emboldened, underlined and italicised text. Originally, big wordprocessors (like *WordStar*) couldn't display text in this manner so they just printed extra characters. Both *Regent* and *That's Write* use WYSIWYG (what you see is what you get – pronounced wizzy wig), a system which shows text as it will be printed.

That's Write has progressed a stage further to provide screen display and output in all sorts of different fonts and an expanded range of text styles. Since the majority of printers don't have different fonts as standard, a document will be printed in graphic format so that the internal-fonts of the machine are disabled and the characters are literally drawn. This means that if your printer is not able to display very good quality graphics then output will suffer. *That's Write* benefits because it uses both graphic and internal printer fonts to get quality output.

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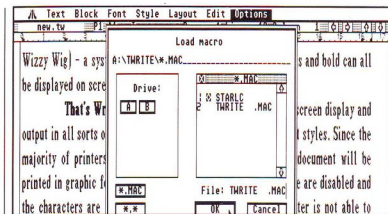
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■ Macros let you record key sequences into a key. Pressing that key later recalls the sequence. The manual claims that one macro can call another and loop. But with no instructions...

wanted. Printing can be aborted at any time by pressing both shift keys.

PARAGRAPH REFORMATTING

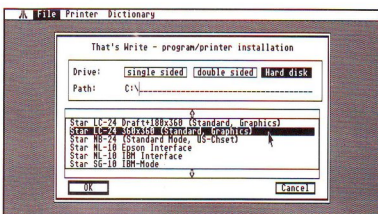
If you don't type anything for a couple of seconds the paragraph is automatically reformatted to suit the current ruler - instead of having the text wrap onto the next line, it continues along the same line and this is scrolled left to accommodate the extra characters entered. Not an ideal approach, and one which becomes annoying when you're trying to read a paragraph that's suddenly in the middle of being reformatted.

One of *That's Write's* biggest strengths is the table of contents option, whereby you can create an index or list of important parts of a document. To benefit from this you first mark all the important lines using a special style option (this can be done whilst you're typing the document). Activating the table command will then cause the contents list to appear on the last page of your document.

Memory problems

That's Write is bulging with features guaranteed to appeal to those finding their current wordprocessor lacking. However, the actual wordprocessing environment isn't inspiring. Not only is the keyboard response slow (even though it doesn't use GDOS fonts) but it's filled with lots of idiosyncrasies which don't make it any easier to use. For a start, the manual does an appalling job of documenting the features. Not only are there spelling mistakes scattered everywhere but important new features are described without examples. It takes a while to learn all the short-cut key commands, and the way you must load each font separately into memory is annoying.

Memory requirements will also be a problem for many users. Whilst *That's Write* will run on a



■ Installing *That's Write* takes a while but it does let you set up the system to work with one specific printer so that you don't need to alter printer drivers during use.

Regent Word II

While there is no lack of public domain word processing software - *First Word* and *ST Writer*, for instance - there is a definite deficit of full-featured budget word processors. PD word processors are fine until you require a specific printer driver or help on a particular subject. And you can forget about more exotic functions like spell checking and mail merging.

Regent Word II is the cheapest commercially available word processor on the market. Before you dismiss it out of hand, though, it does offer most of the features expected of a commercial release.

Full use is made of GEM's windowing and drop-down menu system. Two modes of text entry are permitted: insert and overwrite. Insert is the default. The cursor can be moved using the arrow keys on the keyboard or by clicking on the scroll bars with the mouse pointer.

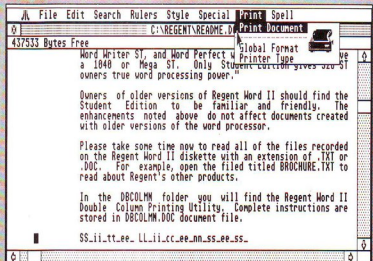
When *Regent* is first started, a ruler automatically appears in the edit window. The ruler determines how text appears on screen. Left and right margins, justification, line spacing, page number and font number can all be altered by clicking on specific areas of the ruler.

For such a cheap word pro-

cessor, the editor is surprisingly rapid. Scrolling up and down, deleting and moving blocks of text is all performed satisfactorily and quickly.

by whatever your printer has to offer.

Finally, *Regent Word* offers many features that you would only expect to find in a £100-plus



■ *Regent Word II* has a fairly standard GEM environment but its features certainly aren't standard for the price. With spell checking and a good editor, you get a lot for the dosh.

Regent Word comes complete with word counter, page and line breaks, document save option in ASCII or *Regent Word* format, an editing menu with insert and overwrite modes, block editing facilities, document rulers, and search and replace.

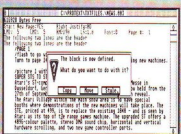
A 30,000-word spelling checker is included (which can be expanded with your additions), as well as many other unexpected additions like a basic calculator, on-line help and an alphabetical sort option.

A large selection of printer drivers are available, and there's the facility to create your own. Sadly, though, there is no support for Atari's Laser. Because *Regent Word* doesn't use GDOS fonts (or, indeed, any other type of fonts), the output fonts are determined

word processor. On the minus side there's no way of merging a file into a document, the spell checker is very Americanized (sic - Ed), and the manual is an eyesore as well as being short on information. Overall an excellent first word processor. ■

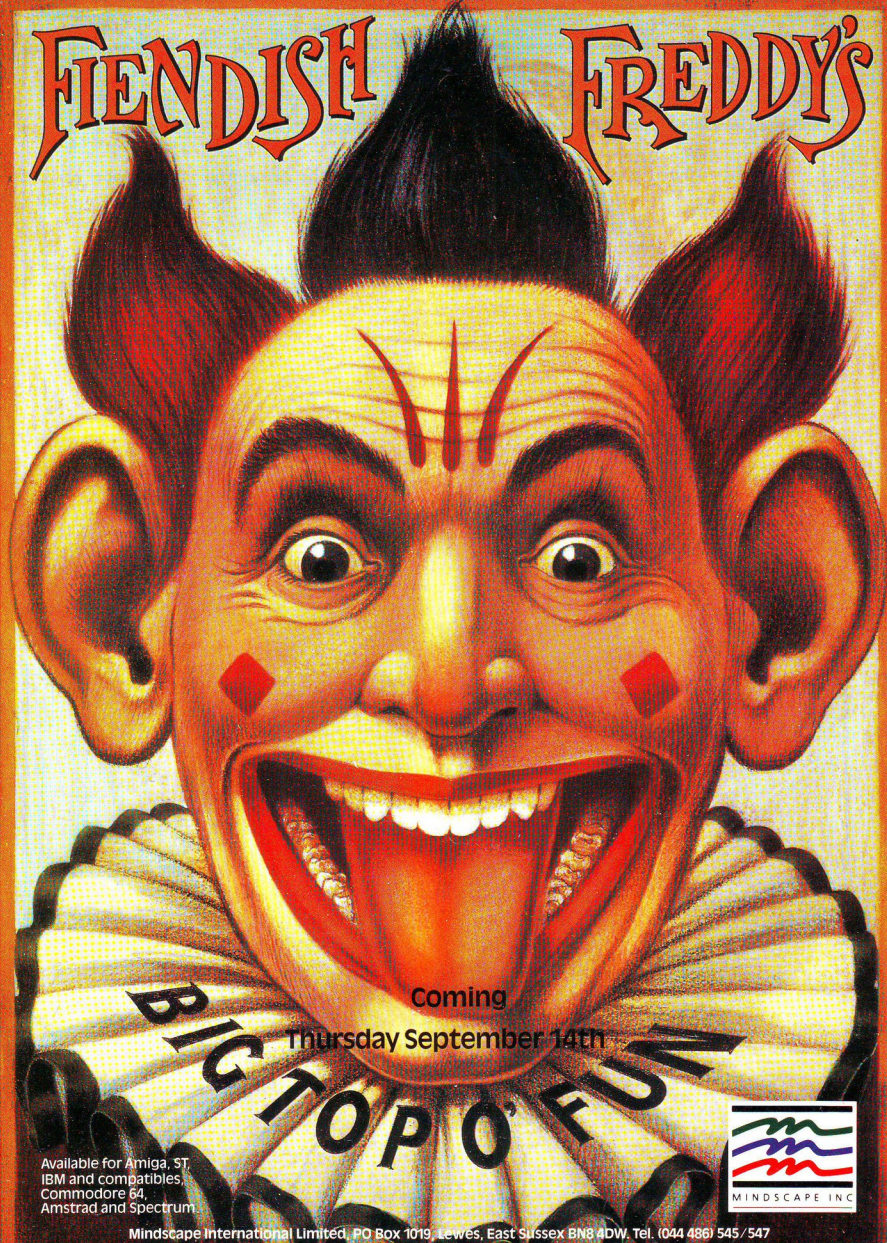
REGENT WORD II
£29.95 ■ All STs ■ ISM,
Grove House, Ventnor Rd,
Apse Heath, Isle of Wight
0893 864674

FORMAT RATINGS	
Features	87%
Speed	69%
Ease of Use	72%
Results	68%
Format Value	89%



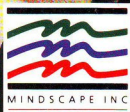
■ Blocks can be defined and then CUT and PASTE.

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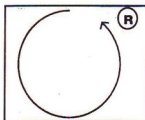
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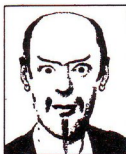
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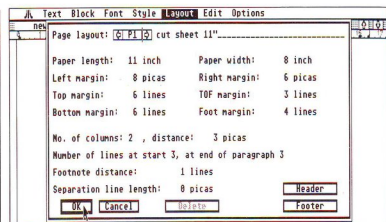
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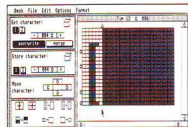
Official Distributors for the That's Series of Programs



■ The page layout dialog box lets you choose the number of columns which make up the page as well as the spacing between lines and the header and footer sizes.

520, you'll lose the dictionary and if you attempt printing with too many fonts then you'll get an out of memory error and no output. Even with 1Mb of memory there are problems in this department.

If you want to be able to print out text in fancy fonts or you need *That's Write's* advanced features – such as contents tables, sophisticated page layout etc, then there's no beating it. But if you intend using your WP for lengthy documents it just doesn't offer that essential speed. A few tweaks would make it the best by far. ■



■ *That's Font* comes bundled with *That's Write* and is a surprisingly sophisticated font designer program.

FORMAT RATINGS

Features 91%

Can mix graphics and printer fonts. And can produce table of contents. No variable point sizes.

Speed 65%

Fine for small documents, but slows down when there's a lot in memory.

Ease of Use 60%

Key strokes difficult to learn and installation is lengthy.

Results 82%

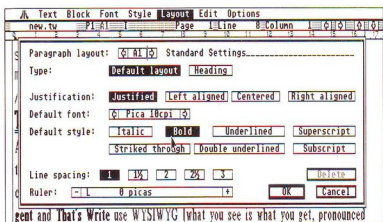
Problems with some printer drivers, although output is fast. Laser output is excellent.

Format Value 72%

Lots of features, but still not cheap.

The Competition

First World Plus, \$79.95, Electric (0480 496666). Microsoft Write, £14.99, Atari, 0753 333444.



■ Paragraph formats can be edited and saved to disk. These let you set up a paragraph structure – useful if *That's Write* is being used to produce a fanzine with established house styles.

Tempus II

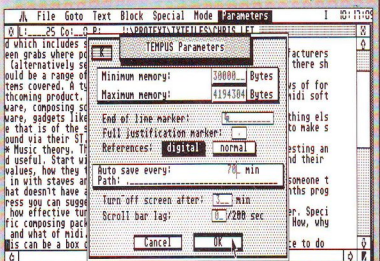
Tempus II differs from the others in that it is intended to be used as a text editor rather than a word-processor. As such, any character code from 0 to 255 may be inserted into your text and combinations of codes (not necessarily 13) can be recognised as a carriage return. *Tempus* is meant for creating special text files such as those that employ VT52 codes (When a file containing VT52 codes is displayed from the Desktop using SHOW, all sorts of special effects can be achieved). Additionally, BASIC, C, Pascal or Assembly language programs can all be written from within the superior environment of *Tempus*. Printer files which include special printer control codes are another major task easily accomplished from within *Tempus*.

When using a high-res monitor you can see the display in 8 by 8 or 8 by 16 mode, thus getting twice as much information on the screen.

Tempus 2 is a follow-up to an earlier version and has been written entirely in machine code so that word-wrapping, text justification and alterations in line length can all be executed virtually instantly.

The ability to call other programs from within *Tempus* is one of its major bonuses. Since *Tempus* is just 70K long it's possible to use it to create program files, save them to disk and then call up a language program (such as GFA BASIC) when you're inside it, importing the code into it and testing its validity.

The text manipulation commands such as the addition of line numbers, sorting and particularly



■ Justification and word-wrapping are permitted but *Tempus 2* is more of a text-editor than a wordprocessor. End of line markers can be altered from a parameters box so that characters other than a carriage return will be treated as line breaks.

comparison between files are important. The comparison feature will look at two files held in memory and highlight any differences between them – of mega importance if you're a programmer trying to track down differences between two pieces of code.

A vast amount of *Tempus* can be specially configured and saved within the actual PRG file. Line length parameters, printer driver info, position and size of the text windows and the layout of the function keys can all be saved in this way. On top of this you can define up to 20 function keys and create and save macros to disk.

When printing, all printer control commands (such as to switch on bold or italics) must be entered into the main text as printer codes (i.e. character codes 27,87,1). Whilst this allows you to access all the printer's fea-

tures, it means that when justifying text or working with the line length, these codes are taken as part of the line even though they're never printed onto paper. Hence, line lengths will not be correct. *Tempus* makes no attempt to resolve this problem because it is primarily a text editor and as such is not intended to be used for printing documents. ■

TEMPUS II
£39.95 ■ All STs ■ HiSoft,
The Old School, Greenfield, Bedford, MK45 5DE
0525 718181

FORMAT RATINGS

Features 81%

Speed 90%

Ease of Use 70%

Results 69%

Format Value 78%

GFA COMPILER

GFA BASIC 3 was a major improvement over earlier versions. So much so that the program files aren't even compatible. This has meant that it's been impossible to compile GFA 3 programs so the vast number of extra features cannot be utilised within a .PRG program file. That is, until now.

The new compiler is not just an update on the old version used to compile GFA 2 programs. Instead it has a completely different environment and offers an enormous number of new features. As you'd expect, you can compile GFA 3 programs without much trouble, but there are also options to link in C code with or without libraries and to compile into Desktop accessories – a major bonus.

A drop-down menu system is used to choose the type of program file you want to create, although keyboard short-cuts are available. But despite the complexity of the new program, BASIC compiling is still very simple and is

GFA BASIC version 3 was released last year and at last GFA has brought out the compiler.

MARK HIGHAM, seasoned GFA freak, takes a look at what it can do.

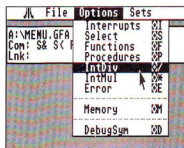
not going to tax the GFA novice too much.

To compile, you first select a file that you intend to work with using the Select option in one of the drop-down menus and then press F10 to initiate the compile and link option. This saves the compiled and linked code into a file called TEST.PRG which can now be tested from within the software. Alternatively, you can quit from the compiler and execute it directly from the Desktop.

GOING FOR SPEED

One very appealing side to the new compiler is the execution speed of the resulting code. The new compiler is also capable of producing code which is far more economical on space than the old version. Where the speed increases are particularly noticeable is in FOR NEXT loops. The new compiler shifts chunks of the screen around better than the old, but there are no improvements with mathematical operations. Nevertheless, all routines run faster than they would have done if executed from the interpreter.

The only problems likely to result are those due to incorrectly written source code. Errors which emerge during execution with the interpreter will cause serious problems with compiled code. For



■ The compiler's new GEM front end can be confusing for first-time users, but the manual makes up for it.

example, if you try to access an array element which doesn't exist in GFA 3, an error message will tell you that the array element is out of range and the program will stop. If you compile the same program then no such error message will appear and instead the array element will be assumed to exist, so important areas of RAM will be overwritten with the new data. If this ventures into memory space already used by other routines the machine will crash next time those routines are accessed. A test could have been included in the code to detect this error, but it would have taken valuable memory space and processor time.

MAKE IT QUICK

It's short-cuts like these which make the new compiler as much

as five times faster than the old one in simple array operations and around ten times faster than the same routines executed from the GFA 3 Interpreter. The compiled code can be specially configured so that error numbers rather than bombs are returned.

The comprehensive manual offers a 15-page section on how to alter your BASIC programs so that when compiled they'll be able to run at the highest possible speed.

One of the integral parts of this new compiler is the way that you can configure the software to produce exactly the code you want. This is backed up with extensive examples in the manual. For example, linking in C code is a simple operation, but even this is described admirably in the manual and accompanied by a short section on peculiarities which might confuse you. All in all it's a great improvement on the old compiler and has the kind of features to make it a contender for serious professional use. How long will it be before GFA-written shoot-em-ups are sold with C routines taking over operations that GFA couldn't handle at speed?

GFA 3 COMPILER
£29.95 ■ All STs ■ GFA,
Box 121, Wokingham,
Berkshire, RG11 9LP
0734794941

FORMAT RATINGS

Features 85%
Comes with support for C functions and accessories.

Speed 90%
Some routines run five times faster than the GFA 2 equivalent.

Ease of Use 70%
Operations well documented. GEM front-end can be confusing for novice.

Results 89%
Substantial speed increases and full compatibility with GFA 3's command set.

Format Value 91%
A must for anyone with GFA BASIC 3.

The Competition
Power BASIC, £49.95, HiSoft, 0252 718181. Also HiSoft BASIC for £79.95. Both are compiled BASICs.

MAKING ACCESSORIES

GEM Desktop accessories can be created using the new compiler, and these will reside in memory until activated.

Firstly, an accessory has to be installed – so you need to declare the accessory as a GEM application and pass its name to GEM so that it will appear in the Desk drop-down menu. Next, the application's ID has to be passed to GEM and then an interrupt has to be set up to scan the keyboard, waiting for the accessory to be accessed. Accessories have to be programmed as an endless loop so that the ST doesn't crash after trying to exit. All this is done from within the main BASIC program so that when it comes to compiling the routine all the information necessary for creating a Desktop accessory will have been included. Compiling this code will result in a program which can be used as a Desktop accessory once the filename extension has been changed.

The manual does an excellent job of explaining this operation, quoting several examples to illustrate the point. These range from the simplest way of creating an accessory to more advanced methods.

COMPILED AND INTERPRETED TIMINGS

	GFA 2	COMPILED 2	GFA 3	COMPILED 3
Loop	2307	1056	1027	755
Screen blit	1672	191	174	171
Trig test	598	510	709	692
Array	586	155	433	26
Maths	703	414	591	442
Random	815	472	406	238
Text	1002	513	517	512
File	3012	3009	2132	950

All timings are measured in seconds.

ABS	CFLOAT	DPEEK	FRE	INTN	MODQ	PRINT	SOPOKE	TRACES
ABSOLUTE	CHARI	DPOKE	FSEL_INPUT	INTOUT	MODE	PRINT AT	SEEK	TRMS
ACHAR	CHAR	DRAW	FSETDATA	KEYDEF	MONITOR	PRINT AT USING	SELECT	TROFF
ACLIP	CHDR	DUMP	FSFIRST	KEYGET	MOUSE	PRINT USING	SETCOLOR	TRON
ACOS	CHDRIVE	EDIT	FSNEXT	KEYLOOK	MOUSEK	PRINT#	SETDRAW	TRON#
ADD	CHRS	ELLIPSE	FULLW	KEYPAD	MOUSEX	PRINT# USING	SETMOUSE	TRUE
ADDQ	CIRCLE	END	FUNCTION	KEYPRESS	MOUSEY	PROCEDURE	SETTIME	TRUNC
ADDRM	CLEAR	ENDFUNC	GB	KEYTEST	MSHRNK	PSAVE	SGET	TYPE
ADDRUT	CLEARW	ENDSELECT	GCONTROL	KILL	MIL	PSET	SGN	UPPER
AFTER	CLIP	EOF	GDOST	L-A	MILQ	PTSN	SHEL_EXVM	V:
AFTERCENT	CLOSE	EGV	GEMDOSQ	LEFTS	MUNU_CHECK	PSOUT	SHEL_FIND	V_CLRWK
AFTERTOP	CLOSJ	EVQJ	GEMSYS	LEN	NAME AS	PTSTQ	SHEL_GET	V_CLRWK
ALERT	CLR	ERASE	GET	LET	NEW	PUT	SHEL_PUT	V_CLRWK
ALINE	CLS	ERR	GET#	LINE	NOT	PUTF	SHEL_READ	V_OPYWK
AND	COLOR	ERRS	GRTN	LINE INPUT	OBAC_ADD	GBORT	SHEL_WRITE	V_OPYWK
ANDQ	ODNT	ERRQ					SHL	V_UPDWK
ANDQ	ODNT	ERRQ					SHOWN	VAL
APOLY	CONTRL	EVEN					SHR	VAL?
APPL_EXIT	COS	EVEN					SN	VARPTR
APPL_FIND	CRSCOL	EVEN					SINGLE	VDBASE
APPL_INIT	CRSLN	EVEN					SNQ	VDBYS
APPL_READ	CVD	EVRS					SLPOKE	VOID
APPL_TPLAY	CYF	EVRS					SOUND	VOT_EXTENT
APPL_TRECORD	CVI	EVRS					SPACES	VOT_NAME
APPL_WRITE	CYL	EVRS					SPC	VSETCOLOR
ARCT	CYS	EVRS					SPOKE	VST_LOAD_FONTS
ARRAYFILL	DATA	EVNT_MULTI	GRAF_SHRINKBOX	LDNG	ON ERROR	RECALL	SPRITE	VST_UNLOAD_FONTS
ARRPTR	DATES	EVNT_TIMER	GRAF_SLIDBOX	LOOP UNTIL	ON GOSUB	RECORD	SPUT	VSTRC
ASC	DATE#	EXEC	GRAF_WATCHBOX	LOOP WHILE	ON MENU	RELSEEK	SQR	VTAB
ASIN	DEC	EXIST	GRAPHMODE	LPEEK	ON MENU BUTTON	REN	SSORT	V H
ATEXT	DEFAULT	EXITF	HARDCOPY	LPOKE	ON MENU MESSAGE	RENAME AS	STEP	W_HAND
ATH	DEFILL	EXP	HDS	LPOS	OPEN	REPEAT UNTIL	STICK	W_INDEX
BASEPAGE	DEFPN	FALSE	HIDEM	LPRINT	OPENW	RESERVE	STOP	WAVE
BCNG	DEFLINE	FATAL	HIMEM	LSET	OPTION BASE	RESTORE	STORE	WHILE.WEND
BCLR	DEFLIST	FGETDATA	HLNE	MALLOC	OR	RESUME	STRS	WIND_CALC
BGET	DEFMARK	FIELDS	HTAB	MAX	ORQ	RESUMENEXT	STRSQ	WIND_CLOSE
BINS	DEFMOUSE	FIELDAT	IF THEN	MENU	OUT	RETURN	STRINGS	WIND_CREATE
BISOQ	DEFNUM	FILES	IF THEN ELSE ENDIF	MENU KILL	OUT?	RIGHTS	SUB	WIND_DELETE
BITBLT	DEFTXT	FILESSELECT	IMP	MENU OFF	PAUSE	RSNTR	SUBQ	WIND_FIND
BLOAD	DEG	FILL	IMPQ	MENU_BAR	PBOX	RMDR	SUCC	WIND_GET
BMOVE	DELAY	FX	INC	MENU_ENABLE	PICIRCLE	RND	SUCCQ	WIND_OPEN
BOUNDARY	DELETE	FLOAT	INPQW	MENU_REGISTER	PEEK	ROL	SWAP	WIND_SET
BOX	DFREE	FN	INKEYS	MENU_TEXT	PPELLISE	ROR	SWAP#	WIND_UPDATE
INPUT	DM	FOR_NEXT	INLINE	MENU_TONORMAL	PI	ROUND	SYSTEM	WINDTAB
DSAVE	DMT	FORM INPUT	INP	MFREE	PLOT	RSET	TAB	WORDQ
DSET	DIR	FORM INPUTS	INP?	MIDS	POINT	RSRC_FREE	TAN	WORK_OUTQ
BITST	DIRS	FORM_ALERT	INPAUX	MISQ	POKE	RSRC_GADDR	TEXT	WRITE#
BYTE	DIV	FORM_BUTTON	INPMDS	MIN	POLYFILL	RSRC_LOAD	TIMES	XBOXQ
BYTQ	DIQ	FORM_CENTER	INPUT	MKDS	POLYLINE	RSRC_OBFX	TIMER	XOR
C:	DO UNTIL	FORM_DIAL	INPUT#	MKDR	POLYMARK	RSRC_SADDR	TITLEW	XORQ
CALL	DO WHILE	FORM_DO	INPUTS	MKFS	POS	RUN	TOPW	TOUCH
CARD	DO_LOOP	FORM_ERROR	INSERT	MKS	PBOX	SAVE		
CARDQ	DOUBLE	FORM_KEYBD	INSTR	MKLS	PRED	SCRIP_READ		
CASE	DOWNTQ	FRAC	INT	MKSS	PREQQ	SCRIP_WRITE		

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QUICK BLOW OVER

MARK HIGHAM dusts down all his old EPROMs slides them into Lakmeyer's programmer and finds ROM for all his software...

Picture it – you look at a green desktop with two icons, one for GFA BASIC and the other for Devpac 2. For a second you ponder which one you want and then double-click on that file. Then wham! – the program appears out of nowhere.

SUPER-FAST READ

Hard drive owners have had this ability ever since they lashed out fistfuls of dosh on the hardware, but if the odd £400 escapes you then Lakmeyer's new EPROM blower is the answer. It allows you to save up to 120K of files onto a 1Mbit EPROM chip. Another piece of software then gives you access to these files as if they were held on a floppy, with one difference – they can be read three times faster.

Special software supplied can expand on the 120K limit by employing an extended file-handling capacity so that 256K of file space becomes available. There's also the ability to split a file into separate upper and lower byte files, which is important for using ST cartridges.

WHAT YOU GET

For the £190 asking price you get the programmer and the software to program common 28 and 32-pin chip types. Chips are extra at



■ 120K storage a near-instantaneous file access from Lakmeyer's EPROM blower.

around £25 each. The programmer plugs into the cartridge port of all STs, although the keyboard cable on the Megapac 2. For a second you ponder which one you want and then double-click on that file. Then wham! – the program appears out of nowhere.

Coding is achieved by copying up to 120K of files into a RAM disk created by the software. Once you're happy with its contents you load another file on the program disk and this will copy the contents onto the chip held in the EPROM blower.

It takes about a minute for the chip to be 'burnt' and once data is on there it cannot be erased without an EPROM eraser. A short verification routine checks that the image is not corrupted by compar-

ing the contents of the chip with those of the RAM disk.

LOADING IN

To access the chip you need to create an AUTO folder on your boot disk and copy a read program into it. This creates a drive icon which may be opened to show all the files on the chip. These can be loaded up as normal – only much faster. The chips can be changed to provide unlimited off-line storage and extra files can be written across in exactly the same way.

The main software is intended for users who don't have any technical knowledge of EPROMs, but an extra program gives access to special features. This software allows you to copy the contents of other EPROMs. To do this you need to select the chip type of the

FORMAT RATINGS

Features 84%
Can program a wide variety of chips. Has editing facilities.

Speed 79%
Blowing is very quick.

Ease of Use 70%
Very simple to use. Protection circuits prevent mistakes. Documentation, though, is naff.

Results 100%
What can you say? It blows chips...

Format Value 80%
A lot of money for a lot of features. 120K is limiting. Vast range of chips supported.

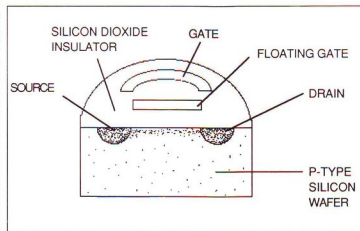
The Competition

No other cartridge-based EPROM blowers are available for the ST.

HOW EPROMS WORK

A blank EPROM (erasable programmable read-only memory) has all its memory cells set to 1 and the blower puts the 0s into it. This is done by applying a momentary voltage to a WRITE pin on the EPROM. The silicon dioxide insulator around the storage area of the memory cell starts to conduct electricity when a voltage is applied. Thus, a stream of negatively-charged electrons can penetrate this insulation. After the charging is over, tiny numbers of electrons remain within the storage area, repelling electrons from underneath. This prevents the normal current flow so the transistor no longer conducts. Hence, the memory cell reads 0.

Since silicon dioxide is such a great insulator, the charge remains for years and only an EPROM eraser will remove it. The EPROM has a ¼-inch square quartz plate in the top and by shining ultra-violet light through this, the silicon dioxide begins to conduct electricity. The charge leaks away and the chip reverts back to 1s.



■ To get a charge into an EPROM cell, 20v are applied between the gate and the drain. The silicon dioxide insulator begins to conduct and current is allowed to flow between the two. When the voltage is removed, tiny numbers of electrons remain on the floating gate and their negative charge repels electrons from underneath. The normal current flow between the source and the drain then ceases and a 0 is thus placed into the storage cell.

original and then activate a read routine, which calls the data into memory. The chip then needs to be replaced with a blank EPROM and data is written back out again.

There are no other EPROM programmers available on the ST so there's not a lot of competition. Nevertheless, £190 is a hefty price, although the software is sophisticated enough to allow you to do virtually anything you want. One disadvantage of EPROMs in general is the limited amount of storage space they offer. Lakmeyer is trying to overcome this problem and has announced a follow-up to the programmer which will act as a hardware read-once-write-many device (like a WORM drive). This will contain two 1Mb chips thus giving access to a lot more memory. But best of all, it can operate at speeds approaching hard-drive specifications. All this for £120. Datel is selling a cartridge which can accept 64K or 128K EPROMs mapped into the cartridge area for just £12.99, so the EPROM scene is well supported.

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WHAT'S
WRONG WITH
VIOLENCE?

So, what is wrong with violence? It's made some of the best computer games in history. Remember back to the days when little round pacmen used to sprint around mazes chewing their way through one ghost after another? And now we've got *Operation Wolf* and *Robocop* – the enemy has become fellow man and the teeth have turned into sub-machine guns. Some of the best games ever have been violent ones. Just look at *Operation Wolf*, *Barbarian II* and *Hostages*.

Operation Wolf is an extreme case, admittedly, but the basis of just about every shoot-'em-up is still an appeal to our own latent violent tendencies.

However, the campaign against violent games, led mainly by the eminent Mrs. Whitehouse, would ban even the standard shoot-'em-up. The games scene could change beyond belief if ever violent games came under attack. Kissing goodbye to the likes of *Blood Money*, *Live and Let Die* and *Xenon II* would be a painful experience indeed.

BACK IN THE OLD DAYS...

Ever since computer games began, the shoot-'em-up has reigned supreme. Five years ago, when Gallup first began to compile a computer games chart, it was made up like this:

1. *Elite*, Acornsoft/Firebird
2. *Formula 1 Sim*, Mastertronic
3. *They Sold a Million*, Hit Squad
4. *Winter Games*, US Gold
5. *Finders Keepers*, Mastertronic
6. *Exploding Fist*, Melbourne Hse
7. *Robin of the Wood*, Odin
8. *Computer Hits 10*, Beau Jolly

9. *Action Biker*, Mastertronic
 10. *Monty on the Run*, Gremlin
- Now the chart looks like this:
1. *Robocop*, Ocean
 2. *Dragon Ninja*, Ocean
 3. *Silkworm*, Virgin
 4. *Forgotten Worlds*, US Gold
 5. *Crazy Cars II*, Empire/EI
 6. *Run the Gauntlet*, Ocean
 7. *Kenny Dalglish*, Cognito
 8. *Operation Wolf*, Ocean
 9. *Red Heat*, Ocean
 10. *Emlyn Hughes*, Audiogenic

Seven out of ten games contain violence, as opposed to just four violent games five years ago.

Some like to blame games for many of today's social problems – but are there really millions of new criminals who've emerged only because of today's TV and interactive computer entertainment?

Dr. Radecki, psychiatrist and leader of an American group opposing violent games, has said "We want the Government to recommend that warning stickers are put onto games. I've been surprised at some of the Rambo-type games which simply involve killing Russian or Vietnamese people. I really feel that in a society with aims such as peace, this is a matter for concern". Like just about everyone else who doesn't play violent games, he doesn't realise that you play the games for the action and involvement, not because of the identity of your opponents.

INTO THE LAIR

Dragon's Lair is a visually brilliant game, and with dragon slaying going on all over the place, had its own streak of violence.

However, it was never as much fun to play as *Better Dead Than*

Alien or *Mirrorsoft's* new *Xenon II* (on this month's cover disk) because it was hard get involved in a game which just took a few strategic moves of the joystick to win the day. What really makes a great game, surely, is that feeling of immediacy and involvement that comes from instant decision-making, and life or death action. And if a machine like the ST, with its great graphic capabilities, can add that extra gory realism, and involve you that much more deeply in the action – then so much the better.

VIOLENT YOUTH

But are violent games really socially damaging? Violence has always seemed to occur more as a product of fashion than as the result of the influence of a few software houses. Mods and Rockers and the Punk movement had nothing to do with violent games.

But then the style of games is changing. Ocean has produced some of the best violent games ever. *Robocop*, *Dragon Ninja* and *Red Heat* – and, of course, *Operation Wolf*. The crucial difference between these games and the traditional shoot-'em-up is that the enemy has now become human.

MORE TO COME

Operation Wolf is close to being the ultimate violent game, but it still falls short of what's possible. What is significant about *Operation Wolf* is the way that you can see your enemy as you blast him. To make this type of game better, the display would have to simulate the view taken from the eyes of the hero. Then, as the gun was drawn level to fire, you could get a full-

GRASS ROOTS GUNPLAY

"Violent computer games are not the pastime of a few delinquent youths, but are enjoyed by just about everyone who's ever played a computer game. Even adventures, long considered the pursuit of eccentric games players are not violence-free. *Bloodwych*, *Quest for the Time Bird* and *Sleeping Gods* all require a generous input of violence.

Kim Harnham claims to be a typical ST games man who's played just about every game there is. The majority haven't made it into his permanent collection but those that have all contain one thing in common – violence.

"I use my ST for nothing but playing games, although my parents never seriously objected to any of them until recently. *Operation Wolf* bothered them a bit so they began to take more of an interest in what was going on. That was the start of a lot of big rows. I remember when they saw *Barbarian II* they were amazed at the way you were supposed to use a sword to chop the heads off giant chickens. I think what really makes the difference is that ST games can be so much more visual – a by-product is that they can occasionally cause offence.

"My parents felt that it wasn't natural to sit in front of a monitor, addicted to games based around violence. I don't think *Operation Wolf* has really changed much for gamers but it has made more people take an interest in what's going on in the games scene and that can't be all bad.

"I've probably heard all the criticism which psychiatrists have made about computer games and I think it's all a load of rubbish. Even if there are a handful of idiots who've taken to the streets with a loaded gun it doesn't mean that the rest of us should pay by losing out on the most addictive games ever.

"I've watched films – especially the Bond movies – where I thought that the violence there was far worse than anything I've seen on my ST."

"Do any games go too far? I know a lot of people felt that *Operation Wolf* had overstepped the mark, but personally it never offended me in the slightest – in fact, the brilliant visuals make it one of the best games I've got."

"Violent films don't have that interactive element. They're an entirely passive experience. That makes a difference because you just don't get that same involvement. But games are really just fun – that's why they're called games.

Anyway, after playing *Operation Wolf*, I've never picked up my air gun and gone out blasting the heads off of pigeons..."

FORMAT'S TOP TEN

1. OPERATION WOLF OCEAN, £19.95

One of the best violent games yet. Great visuals, addictive and filled with lots of blood and bullets.

2. STRIDER US GOLD, £19.99

Hacking enemies to death with a sword is great fun – just a shame you don't get to see much blood.

3. BLOOD MONEY PSYGNOSIS, £24.95

A classic shoot-'em-up and a game you can really get involved in. Great animation.

4. XENON II MIRRORSOFT, £24.99

The Bitmaps' best yet. Visuals at their best. See the review on page 82.

5. DOUBLE DRAGON MASTERTRONIC, £19.95

A beat-'em-up with lots of punching, kicking and screaming.

6. BARBARIAN II PALACE, £19.95

Hacking and slaying one enemy after another. You can rip out hearts and hack off heads.

7. PLATOON OCEAN, £19.95

Non-stop slaughter of Viet-Cong soldiers.

8. BETTER DEAD THAN ALIEN BDTA CREW/ELECTRA, £19.95

Simple but frighteningly addictive shoot-'em-up. A revamped *Space Invaders* with more bullets, invaders and destruction.

9. GALDREGON'S DOMAIN PANDORA, £19.99

Even adventures can be violent. Lots of icons give a choice on how you want the enemy to die.

10. BORODINO ATARI, £24.95

Plenty of foreign armies to wipe out in this ultimate wargame



screen view of the victim's face. In a perfect world you'd see it crinkle with pain and the eyes bulge with fear just before being treated to a liberal spurting of blood.

CALLING OUT THE CAVALRY

Imagine the resonance if a software house ever brought out a game like this?

It's doubtful whether it would stay on the shelves for ten minutes before the Mrs. Whitehouse Brigade gained new impetus and a court order. At the very least the programmers would find themselves in the middle of a Salman Rushdie-type hate campaign.

It's hard to see why anyone should condemn a game like this when you look at the benefits to be had from playing violent games. They offer the opportunity to vent anger on a computer image that can no more feel pain than it can successfully ponder the predictable outcome of Neighbours. If you could go a stage further and replace the computer faces with digitised pictures of your own enemies, then a weekend could happily be spent splattering your boss into a million blood-drenched pieces. When you went back on Monday morning you wouldn't feel the slightest inclination to test the aim of the luger in your bottom drawer because all your anger would have been spent elsewhere.

Unfortunately the ST is not yet capable of producing the visuals for this type of game. However, Atari is going ahead with its new STE - a machine which holds enormous possibilities for the future of the games scene.

Maybe there's a new era of violent games just around the corner as the STE brings even better graphics and sound.

One way or another, as games software grows ever more realistically and violent, it looks like there's a bumpy ride ahead. ■

FROM FILM TO ST

Much criticism has been levelled at the Bond movies over the years. Conversions like *Live and Let Die* and Domark's more recent *Living Daylights* have caused concern amongst anti-violence campaigners. The idea that you become the hero of the film and blast everyone to death is supposed to be particularly bad.

Perhaps one of the best film conversions is *Platoon*, again from Ocean. The film has a very anti-war message, but Ocean's conversion succeeded in turning it into one of the most violent film licences ever.



■ **Animal Safari** is proud of its violent elements. The mouse is used to control a gun sight which must be placed over the heads of rabbits, birds and other forest life. By clicking you release a burst of firepower intended to kill the animal.



■ **Barbarian II** - one of Palace's classic slay-'em-ups - has oversized chickens as the enemy. The objective is to slice off their heads and procede forwards to take arms against the next pre-historic beast.



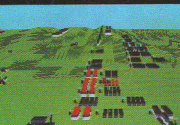
■ Even traditional games haven't gone untouched. EA's **Battlechess** incorporates a novel difference. The chess pieces march up to each other and fight it out for possession of the square in some really impressive battle scenes.



■ For many, **Operation Wolf** is the sickest game yet released. With massive soldiers hungry for lead, it caused a lot of anger amongst the campaigners but still remains one of the classic ST games - loved by all.



■ **US Gold's Strider**, one of the latest games to appear on the ST scene, shows that the idea of slashing characters into shreds with a sword makes brilliant *Format Golds* material (catch the full review, p78). Violent games are more popular today than ever.



■ The war game has always been far more of a strategic mission than a graphic one, so it's escaped much of the controversy. However, famous battles like that at Waterloo contain huge amounts of implied violence. Increasingly, these games are trying to simulate reality, so how long will it before a full-blown battle scene is played out in front of you with sampled screams and shouts?

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WELCOME TO SCREENPLAY, THE GUIDE TO ST LEISURE SOFTWARE

SMALL

FRY

WAR

WITH THE

GIANTS

This month Screenplay follows Moonwalker and Team Yankee from the drawing board to the shelves

Welcome to yet another 'new look' games section. This month we're including boxouts on all sorts of things relevant to each review because we want you to know all there is about a game – from the programming team behind it to the history of the software house to the quality of each arcade conversion.

This month also sees the start of a new series on how games get from the drawing board to the shelves. We're not just doing another programmers interview, this is a look at how licences are acquired and what the software houses have to do to get a game on the shelves. As an example, we're providing an exclusive look at two new

games – US Gold's Moonwalker and Team Yankee from Entertainment International. We hope you enjoy it.

Mark Higham

HOW THE RATINGS WORK

Graphics

The ST is capable of some great graphics and animation so the last thing you want is old-fashioned 8-bit graphics with tiny sprites and jerky movement. Graphics rating takes both still and moving graphics into account.

Sound

Your ST holds the power to output some great audio effects – not just sampled music

but also some nifty tunes. One thing which doesn't go down well with our team of reviewers is monotonous beeps.

Intelligence

Just how clever do you need to be to pick up a game and play it? If you have to spend hours pouring over a manual or planning strategies then a high-score appears here.

Instant Appeal

If there are a thousand and one instructions to read before you can even boot up the game then it's hardly instantly playable. You need to be able to shove the disk in and play for a game to have instant appeal.

Long-term Interest

The long-term interest level looks at how appealing a game will be after several hours of play. This, and the instant appeal score are meant to be read together so that you get some idea of how long a game needs to be played to appreciate its finer points.

Overall

Taking all the above into consideration and comparing it to recent similar games, we award a percentage score. However, as time goes by the ST games are becoming increasingly better so that a game which was rated Format Gold a year ago may well no longer warrant such a score now.

PLUS XENON II 82 / STRIDER 78 / CONFLICT EUROPE 74

Ancient Egypt is the setting for *Eye of Horus*, where Horus is a hawk-headed god who battles against his evil half-brother Set.

The god Osiris, Horus's father, has been dismembered and his remains scattered across a huge labyrinth. Horus must collect seven severed members and return them to the burial chamber where they can be re-animated to restore peace and well-being to the land.



■ Osiris's head and thighs are dropped off in the burial chamber. Five more bits to go.

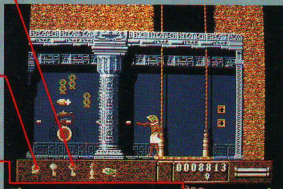
As Horus you explore the labyrinth of chambers looking for the seven bits of body. Once they've been put together, you'll have enough power to deal with Set in a final confrontation.

However, Egyptian hieroglyphs on all the walls have been animated by Set so they'll attack you.

■ Keys are used to open up lifts in the temple.

■ The Amulet of the Shen incapacitates foes.

■ A scarabepresents your life energy.



■ This icon allows you to view the map.

EYE OF HORUS

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Moving around can be done in two ways: as a hawk-headed man or the hawk. In both you fight off hieroglyphs with energy bolts.

There are over thirty objects to collect including body parts, amulets and colour-coded keys. There are eight keys which unlock certain lifts and allow movement between levels. The blue key takes you to your final battle with Set.

Each of the amulets bestow a different power on Horus to help him. Amulets of the Sam and Heart will summon the god Anubis and goddess Isis respectively to assist. The amulet of the steps is handy since it shows a map of the tomb with your current position. The frog amulet awards an extra life whilst others open new sections of the tomb, improve your power or shield you from evil forces.

EFFECTS

Horus certainly walks like an Egyptian, especially when he's zap-

ping hieroglyphs in humanoid form. Animation is perfect and four-way scrolling is fast and smooth. The hawk Horus flaps around with grace and ease. Atmospheric Egyptian music plays throughout and sound effects are satisfactory.

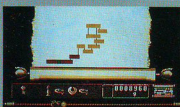
VERDICT

Eye of Horus successfully mixes shoot-em-up arcade-style action with intriguing puzzles and object manipulation to produce an interesting and challenging game. It may not be a major innovation or particularly original, but the element of Egyptian mythology makes it enjoyable enough to keep you battling Set and his minions for a long time.

Gary Barrett

GRAPHICS	8
SOUNDTRACK	7
INTELLIGENCE	6
INSTANT APPEAL	8
LONG TERM INTEREST	8

OVERALL 84%



■ A map is given when you find the amulet of the Steps.



■ There's lots of good animation. Here, Horus becomes a hawk.

DENTON'S LATEST DESIGNS

Shadowfire was one of Denton Designs' most popular games and was an icon-based adventure/skirmish release. But there have been lots of others including *Gift from the Gods*, *Frankie Goes to Hollywood*, *Where Time Stood Still* and *The Great Escape*. Quality has varied but *Eye of Horus* is definitely their best yet.

Wreckers is its next project, this time for Audiogenic. It's a classic mixture of strategy and arcade action in a space station overtaken by cosmids. Looking forward to 1990, DD is planning a game called *New Moon* for Intergams. You're a journalist in a future city wandering across a United States of Europe where everything is owned by one man. With a shareholders meeting coming up you must uncover evidence to expose The Boss. It's an arcade adventure but sounds like gutter journalism to me!

SLAYER

HEWSON - £19.95

Is the day of the horizontal shoot-em-up over? Never. *Slayer* is the latest one to hit the ST, from the same guys who did *Zynaps*. You must complete six levels meeting an end-of-level guardian in each. Along the way

you pick up extra weapons and a shield to protect you from aliens and other obstacles.

You're confronted by a range of obstacles, but by far the most annoying are the green ping-pong balls which bounce around the screen. They can't be destroyed, so the only way forward is to dodge them. Since the display is constantly scrolling, you can't stop and wait for a gap but must use your skill to guide the ship.

Holding down on the joystick causes the ship to flatten out so you can pass certain obstacles - essential in the later levels where

the game becomes insanely complicated.

EFFECTS

Graphically, *Slayer* doesn't have a lot to rave about. Sprites are nothing mammoth and besides the ping-pong balls, animation is basic. Guardians, whilst extremely well-drawn haven't been animated. At best they flip a tongue in and out but there's nothing here to rival other classic shoot-em-ups. Sound consists of a few noises into and standard firing sounds during gameplay. There are also a handful of other spot effects.

VERDICT

You've seen one shoot-em-up you've seen the lot - that's the impression you get with *Slayer*. In

a market-place crammed with shoot-em-ups, it takes a lot to make a decent game. Unlike *Blood Money* or *Forgotten Worlds*, the graphics or gameplay won't set it aside from the rest. But by far its worst point is the difficulty level. Making a game so hard that no-one can get past level two does little to make it addictive.

Mark Higham

GRAPHICS	6
SOUNDTRACK	6
INTELLIGENCE	1
INSTANT APPEAL	5
LONG TERM INTEREST	3

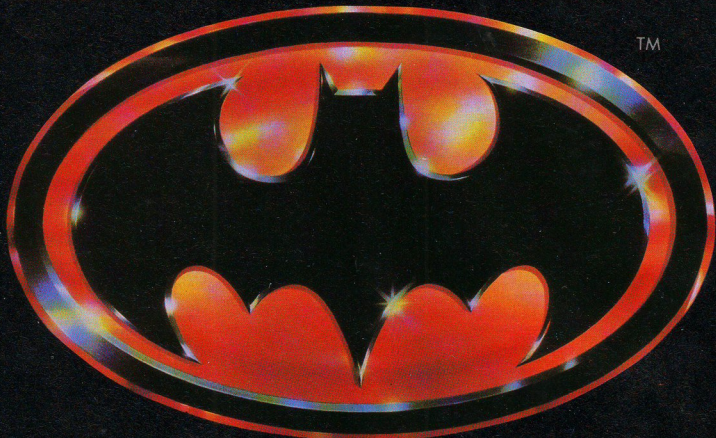
OVERALL 54%



■ End-of-level guardians look good but they're not animated

WATCH YOUR SCREEN – SEPTEMBER

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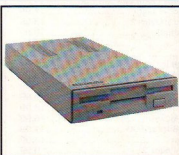
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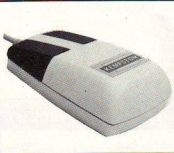


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■ The opening sequence.



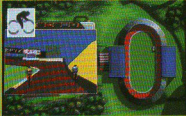
■ The miffed mole in archery.



■ Hanging from the rings.



■ The parallel bars



■ A bicycle made for one.



■ Diving for gold.



■ The pole vault's tricky!



■ Stumbling in the hurdles.

Over a year ago there was an event in Seoul called the Olympics. Epix decided to release another in their line of sporting games to coincide with them. Unfortunately the ST version missed the Olympics, but it still looks like it was worth the wait.

Summer Games has eight events: hammer throwing, archery, bicycle racing, pole vault, hurdles, diving, parallel bars and rings.

Most of the events are made entertaining by some amusing oddities. Hammer throwing, for example, can go hopelessly wrong: you can get battered in the head by the hammer, fly off the screen for not letting go, throw the hammer through the monitor or toss it through the protective fence.

Archery is another event with silliness thrown into an otherwise ordinary hit-the-target-with-a-pointy-stick game. The odd bits emerge when you hit the bull or shoot over or under the target. A bullseye sends a bunny hopping across the screen, a myopic mole pops up when you shoot low and a birdy bites the dust if you overshoot.

The Hurdles is simple enough although lots of waggling and jumping is essential to complete the event. Falling over once is enough to get you out of the race.

If you're into water, you can go diving. Board tension may be adjusted before you leap and there are options for front or back dives. Judges award points in five categories to give an overall rating.

Polevaulting is great but you need to make sure you don't bash your head on the crossbar as you pass over.

Cycling is the last outdoor



■ The Olympic village is the opening screen and it has icons for all eight events. You must select one to begin play.

event. You race against a computer opponent, pedalling like mad. But keep track of your energy or you'll burn out too quick.

Parallel bars are first on the gymnastics front. You must swing from bar to bar doing lots of daft manoeuvres. A help feature and demo mode make things easier.

Finally, there are the rings, which require lots of waggling, faster waggling being needed for more strenuous activities. Points are awarded for style and content.

EFFECTS

The graphics are all beautifully animated and the mole in the archery is particularly good. Colour is well used throughout all events. Tunes are included for all 24 countries taking part in the games and each event has its own tune.

VERDICT

Sporting sims. have been around for a very long time and they just get better and better. The Epix

games have always managed to mix pure waggling with some skill to produce games that anyone can master eventually – and *Summer Edition* has the mix just right.

The only really bad point to the game is the amount of disk swapping necessary to play through a series of events.

Humour only occasionally creeps into most sporting sims. But *Summer Edition* raises a smile for almost every occurrence. These humorous asides don't add anything to the gameplay, but they certainly make it much more fun.

Gary Barrett



■ Mess up the hammer and your monitor shatters.

EPYX AND THE SPORTS SIMULATOR

Since 1984, Epix has been establishing itself as the number one house for sports sim games – particularly in the US, where the demand for these games is staggering. *Summer Games 1* started the ball rolling back in the Summer of '84, and every year since there's been either a Winter or Summer sports release.

In '86 a special *World Games* was brought out, with *California Games* appearing in '87 on all major formats except ST. It has taken another two years for *California Games* to make it onto the ST, but it's not brilliant. Graphics are decidedly 8-bit and the sporting challenges aren't nearly as exciting as those in *The Games Summer Edition*. Nevertheless, other formats have already sold 2m copies worldwide.

So how does Epix intend to move in the future? Its next project is *Snowstrike*, a driving sim. The US branch works independently to the UK – shown by the way Epix in US are about to release *Acts of Rage* – a game which their UK branch say we'll never see in Britain.

At this year's PCW show, Epix intends showing a number of new games along with a C-64 demo of *Snowstrike* on display.

GRAPHICS	8
SOUNDTRACK	7
INTELLIGENCE	5
INSTANT APPEAL	8
LONG TERM INTEREST	7
OVERALL	82%

POWER GAMES

With the rush for Christmas hotting up, **MARK HIGHAM** begins a look at how two contenders operate by following *Moonwalker* and *Team Yankee* as they go from the drawing board to the dealer.

Software houses are a curious bunch – they advertise some games for months before they're released, others get reviewed and then we never see them on the shelves, and then still more appear amidst masses of hype and vanish just as quickly. With Christmas coming, they're all forced to get their act together so we decided to follow two games – one from a large house and one from the band of smaller houses. *Moonwalker* is a maze game that's been in the pipeline for some time, and *Team Yankee* is a tank simulator that's been in the pipeline for some time. Both are scheduled for a Christmas release, but *Team Yankee* is aiming for the Christmas Eve number, one Christmas Eve before the other.

As things stand, it's on schedule for a December release. On the Entertainment International side, *Team Yankee* is again its biggest licence but it's nowhere near as big as *Moonwalker*.

GRANNY MONEY

Team Yankee comes from an American book extremely popular in the States but which hasn't made nearly the same impact in the UK. Originally it was intended to be *Team Yankee* to be released in the States first, and this read the words of Granny Money, the author of the book, purchased by the UK publisher. The publisher then decided to release the book in the UK first, and this read the words of Granny Money, the author of the book, purchased by the UK publisher. The publisher then decided to release the book in the UK first, and this read the words of Granny Money, the author of the book, purchased by the UK publisher.

THE SCENE ABROAD

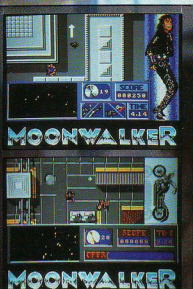
Gearing a particular project for sale abroad is never easy. Obtaining good licences helps because the game can at least ride on the popularity of its forefather.

Germany is by far the largest ST games market outside of the UK, so grabbing the public there can see you amassing huge fortunes. Unfortunately, Germany has a big anti-violence movement which has led to many games being banned. By designing a tank simulator, EI is leaving itself open to possible attack so it's doing its best to make sure that *Team Yankee* will get through okay.

US Gold had a more stringent master to please. If Michael Jackson had heard that Gold intended to include the slightest element of violence then he would have pulled the project immediately.

Since the *Team Yankee* licence is obviously nowhere near as big as *Moonwalker*, to make sure that its foreign distributors had heard of the name when they finally received the product, EI sent them all a copy of the book. It didn't matter whether distributors read the book or not – just so long as they remembered the name.

Release dates for both games are set to the same date abroad as in the UK. This means that massive quantities of packaging need arranging, which only adds to the complexity of launch arrangements.



■ *Moonwalker* is a four-level game with some brilliant visuals, particularly in the later levels.

MOONWALKER

The *Moonwalker* game was particularly difficult to devise because the film didn't have a decent plot. This was where Mike Wilding's skill came in. He sat down with Emerald, the programmers, and discussed the film until they eventually came up with a four-level game which looks like it's going to be both challenging and addictive.

Level One is a maze-type game, with the objective being to collect four artifacts and eight pieces of the rabbit suit. Level two goes a stage further, seeing you collecting orbs which will eventually lead you through to Level Three. Here, you must walk around Club 30 – a sideways scrolling level – collecting weapons and ammunition to shoot around 20 troopers. This done, you transform into a robot and tackle Mr. Big in the final level.

The game will be designed so that it can be played by shoot-'em-up addicts and strategists alike.

December. However, the potentially long shelf-life of a tank sim game makes dates less critical.

The licence trade is a tough one. Not only are they extremely expensive to get hold of, but companies handling licences often impose conditions on the game. They generally need to see them during development to make sure they're happy with the direction, and once games are finished, they have to give their okay before release. When the licence company is based abroad, all this tooting and froing can often hold up the release of a game (a problem which beset Softex's *Garfield* – because of difficulties with the US



■ The main Team Yankee playing screen.

it missed its initial February release date and didn't make an appearance until July – when a Christmas release is intended companies can't afford any delays.

THE LICENCE TRADE

Both US Gold and EI obtained their licences from America. The bonus with a foreign licence, particularly so in the case of *Moonwalker*, is the worldwide recognition – important in foreign sales. Even if you can only saturate the US market then you're guaranteed, by money, respectability, and a marketing network, a certain success.

Both US Gold and EI were able to avoid the usual caveats involved in the licence trade. American Gold has also the advantage of being a local company.

THE BOOK TRADE

EI had no such trouble with Team Yankee. Presidio Press holds that licence and since both the book and board game focus on the war between Russia and America, violent tactics are essential. Book licences are always much easier to handle anyway. For a start, they're less expensive and since they're rarely sought-after they're often held by companies which have had few dealings with the computer market. This was the case with Team Yankee. Presidio Press imposed no conditions on the game, and whilst the company does ask to see it at various stages, it will make only constructive suggestions.

But the licence process is a lengthy one. It isn't a case of going to the right company armed with fistfuls of dollars. Often the licence is auctioned – an event that can go unpublicised – so a certain amount of inside knowledge is essential.

PERFECT TIMING

Most surprising about the games market is the timing process. Format was the first to reveal that US Gold was bringing out a *Moonwalker* game way back in the May issue, but plans for both games were first initiated months earlier in February. The idea of working on a Christmas No. 1 at the beginning of the year makes the computer hype seem distinctly false.

Once the licence has been obtained the next stage is to work out who's going to do the programming and which elements of the licence are to be included. In both cases, the companies sat down and discussed what they wanted to see with the project leaders assigned to each game.

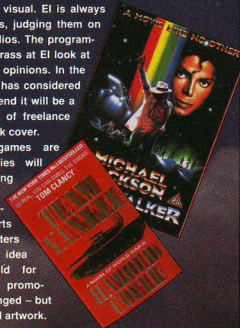
US Gold has been responsible for a lot of great adventures, and it's no surprise that it has built up a strong method of working with them. Mike White was put in charge of the *Moonwalker* project.

ARTWORK

Artwork for the games started back in July with both companies formulating their own suggestions for boxes and posters. US Gold always takes its artwork ideas to the Camel art agency which employs a vast range of artists. Camel was responsible for *Forgotten Worlds*, *Vigilante*, *Skweek* and *Strider* artwork. US Gold has already seen some initial airbrushed designs, but has yet to make a firm decision.

EI, on the other hand, has gone to a freelance artist to transform its ideas into something visual. EI is always on the lookout for artists, judging them on the merits of their portfolios. The programming team and the top brass at EI look at the work and voice their opinions. In the case of Team Yankee, EI has considered several ideas and in the end it will be a choice between a piece of freelance work and the original book cover.

Just before the games are released, both companies will print posters and packaging from the artwork eventually agreed upon. In special circumstances, adverts could be used as posters within magazines (an idea suggested by US Gold for *Moonwalker*) and other promotional gear could be arranged – but all this requires additional artwork.



could not be achieved.

EI, being a smaller company, doesn't have either the staff or the experience to have formulated some kind of standard approach. Thus, it's left all its program design up to Dr. David Pringle, of ODE software – the Oxford-based programming team assigned to the project. He has had a lot of experience with 16-bit software, and particularly game design, so he took the idea for the Team Yankee project to EI and the company was happy for him to use his contacts in obtaining the licence and for him to take any work he wanted.

of the 16-bit side of the game. This means there is a less formal feeling about the set up, so more of a chance for the typical games player to voice an opinion about the game. ODE is responsible for programming both 16- and 8-bit games, so there are a lot of game testers and programmers hanging around to offer opinions.

■ Next month we'll provide an in-depth look at what has gone into the programming of both games as well as an insight into the distribution and advertising processes that gets the right games into the right shops at the right time.

TEAM YANKEE

Tank simulators have been done to death by now. Even Microprose, notorious on the simulator scene, has another in the pipeline. When Empire sat down and thought about the game, it was the intention to produce something new and unusual which people could enjoy playing and – judging by its initial ideas – that's been achieved.

The game will be centred around the view from one of four tank divisions. With the screen split into four squares, views from several divisions can be seen at once. Each division will be controlled using a limited range of icons. To aim at the opposition you need to zoom in on just one view so that this fills the screen – along with extra icons providing increased firing features.

The ball was in, you pits of the earth stupid computer! That and other similarly delicate comments will be gracing the homes of many an ST-owning tennis fan with the release of *Passing Shot*, a conversion of the Sega coin-op, from Imageworks.

The game opens with a screen showing the countries in which the tournament is to take place; France, Australia, the U.S. of A and Old Blighty. Also shown are two portraits of the players you control, only one of which is used in the single-player game.

After selecting single or doubles and the difficulty level (four options ranging from easy to hard), it's on with the match.

Play begins with service which is always viewed from just behind your player and looking into the court. After that initial shot the game's perspective changes to an overhead view until the end of the volley. The screen scrolls vertically following the ball, the height of which can be judged by its size as it falls into and out of the screen with a 3D effect. Though your player is sometimes lost off of the end of the screen while the ball is in the opposition's court, the knack

PASSING SHOT

IMAGEWORKS/MIRRORSOFT - £19.95

of moving into that all-important returning position soon becomes second nature and *Passing Shot's* playability begins to bite.

Four types of stroke are available to your player - Flat, Slice, Topspin and Lob - with each accessed by a simple flick of the joystick. But at first with the sheer panic of trying to play the ball you'll be relieved just to have reached it to worry about how successfully it's returned.

EFFECTS

Sound in *Passing Shot* is limited to naff tunes and a bouncing ball effect. Graphics are competent, though nothing to write home about. The scrolling is fast and smooth.

VERDICT

Its unique game style and ease of play make it one of the most addictive tennis sims out, especially in the two-player doubles mode. It's a lot of fun to play, even if you aren't a tennis addict.

Dave Packer

GRAPHICS	6
SOUNDTRACK	4
INTELLIGENCE	5
INSTANT APPEAL	8
LONG TERM INTEREST	8
OVERALL	71%

BEHIND THE SCENE

Tech, the team behind *Running Man* and *Pacmania* was responsible for the game design and coding of *Passing Shot*, with Mike Hart doing the ST coding with *Devpac 2*. All the graphics were taken directly from the coin-op ROMs and ported across into Mirrorsoft's *Art Director* where they were re-sized and the 32 colours of the coin-op game were adjusted.

According to Tony Caverner of Tech, the hardest part was the logic element. They tried to make it as much of a tennis simulator as possible but at the same time staying faithful to the Sega coin-op game.

Since the arcade version was designed to eat up coinage at a rapid rate, certain features of a genuine tennis game were never implemented. For example, the two-player option doesn't allow one player to battle against another. Instead, you must play doubles against the computer - hardly ideal for a tennis simulator.

Since Sega has to give its approval to every conversion, *Passing Shot* had to remain faithful to the arcade game otherwise it would never have made it onto the shelves. The development of *Passing Shot* took four months but getting Sega's approval took a further three weeks.



■ Serving - the only time that play is viewed from the end of the court. Throw the ball up in the air and hit it. Thankfully you don't get blinded by the sun when you look up, if only real life was like that.

ARCADE ACTION

Although Imageworks has managed to capture the spirit and addictiveness of Sega's arcade original, the graphics have been toned down for the ST version. The most noticeable changes are on the service screen, where the characters are smaller and less detailed. The action isn't as violent as the coin-op game, which really did capture the



■ Arcade (left) vs ST version (above).

spirit of the sport - and this - does make it less fun to play. Sound effects in the ST game, like the graphics, aren't as effective but this doesn't upset the game play.

■ Hitting the ball between players in a singles game.

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The desperate realities of nuclear war are dealt with in this, the latest of PSS's wargames. It's an adaptation of the 8-bit game, *Theatre Europe*, which was released back in '85 and won Strategy Game of the Year. This differs from average wargames because the war is set in the future. Nevertheless, it's a future which the game aims to show could come to pass quickly unless nuclear weapons are banished altogether.

East and West are locked in combat, and once you've decided which side to play, your task is to win the war without causing a nuclear holocaust. There are options dictating the political climate at the time so you could play after the INF treaty or even in a special case where Europe has split away from NATO.

Once into the main playing arena you see a map where you and your enemies are shown and where all combat will take place.

The game works in turns first you play and then the computer. At the start of each turn you move your units around the map using a boxed cursor which is positioned over a unit and then directed into an adjacent square. A status line at the bottom of the map indicates how strong each of your own and the opposing units are in relevant fields. This lets you know whether to move stronger units in to protect weak fronts or employ other strategic moves.

In the same way you select which units will attack. Your units can only attack those in adjacent squares and, once battle commences, the order cannot be undone. The outcome of the fighting is decided by your strengths. Extra armaments are awarded after battle to rebuild your armies.

The war continues with units being gradually wiped out. Special missions involving reconnaissance or chemical warfare can be carried out to improve your success.

Beneath the map are a set of control panels. One of these gives access to nuclear weapons, and specific codes must be entered before you can launch a vast range of missiles. Depending on the political climate at the time, retaliatory

CONFLICT EUROPE

PSS/MIRRORSOFT - £24.99



■ Radiation levels go up after nuking. ■ Population map reports casualties. ■ Teletype reports daily activities.

measures may be taken and global nuclear war can ensue.

EFFECTS

The main map shows units depicted as squares - not very thrilling. Engaging in ordinary attack is nothing special either, but the teletype which records all details of the battle does look surprisingly realistic.

For a wargame, the effects are brilliant. Nuking is a major decision, so warning sirens' sound whilst you're entering the codes. If you continue to launch a nuclear attack, the display switches to a view of the unit or units as they go

up in an effective mushroom cloud.

Brilliant sampled speech and music make up the intro sequence, but apart from other minor attack noises everything is fairly quiet.

VERDICT

Conflict Europe doesn't have all the intricacies of battle found in *Waterloo* or *Borodino* but it's extremely addictive even for players who aren't wargame fanatics. The graphical effects and the whole atmosphere make it exciting and occasionally very chilling, so it's an addictive challenge, especially when full-scale nuclear war erupts.

Ken Ralton

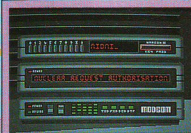
FOR REAL

David Steel was involved in development of both 8 and 16-bit versions and concentrated on accuracy to the political state. He researched the strengths of both sides and when he let the computer play itself he found that NATO was left with one option - to resort to nuclear attack or let West Germany fall to the enemy.

Whilst working with the 8-bit game he said: "I'd wanted to write a war game based on the situation in Europe to see what would happen. I didn't start out with an axe to grind, we just took the program and put in the most reliable information we could get." This result is disturbing since it is NATO's policy to go nuclear if conventional forces can't fend off the Warsaw Pact.

The 16-bit game has been modified to reflect the change in East-West relations. Now he says "More has been done with special missions but NATO would still be forced into taking nuclear action... but the future looks more promising now. I think it's become a war which may never need to be fought."

GRAPHICS	7
SOUNDTRACK	4
INTELLIGENCE	5
INSTANT APPEAL	7
LONG TERM INTEREST	8
OVERALL	84%



■ Codes must be entered to launch a nuclear attack...



■ You watch the missiles head for their target...



■ They get there and you've left millions of casualties.



■ Too many casualties, so the game is over.



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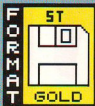
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STRIDER



US GOLD - £19.99

Those pesky Russkies are at it again in US Gold's latest Capcom conversion.

The game is set in the year 2050, when the Russian army has advanced to such a degree that there is only one man who can overcome the daunting powers of evil – and his name is Strider.

Unfortunately, the good Mr. Strider is under your control, so the likelihood of good indeed winning the day seems less certain after all...



■ Between levels of Herman pops up to let you know things aren't as easy as they look.

Strider is based around that eternal battle between good and evil with all the action set across the plains of Russia – from the coldest depths of Siberia to the bustling KGB zone of Red Square. The objective is to fight the Lord and all his minions across four levels of horizontally-scrolling action.

The game starts with you being dropped off in a futuristic Red Square where you use your trusty and effective sword to lay into all KGB agents who fire at you.

Strider has one speciality which makes him perfect for the job – he's an acrobat capable of some astonishing movements. He can leap unnaturally into the air, somersault, slide along the floor and jump in all directions so that – with a little skill and judgement – you can avoid attack from all your Russian enemies and leap from one platform to another with perfect ease.

■ This knife-wielding fellow is after your blood so you need to make sure Strider's acrobatics are up to scratch if you want to move on level two.



The middle and end of each of the four levels has a guardian who must be defeated before you can progress any further. It takes a while to figure out the best way of polishing him off but with practice you soon learn where you need to stand and fire for the best results.

Extra weapons have been included to make these challenges a lot easier. At strategic points along the way, you can lay your hands on a super-long sword and there's even a drone to be picked up. All weapons are lost whenever you're hit, although it takes three hits before you lose one of the three lives with which you began the game.

HOW IT WAS DONE

Tiertex are the programming team behind Strider, with the ST version being written by John Prince, 35. Tiertex have been programming for US Gold for some time now but this is only John's second ST project. Strider was started back in January and has been written using Devpac 2 on a mega ST2.

John says he prefers the ST game to the Amiga version because of the increased playability and says of the great ST vs Amiga debate: "The ST is a better machine to develop on largely because the

disk loading is much easier to handle from a developer's point of view. The Amiga is better visually but with the dedicated hardware scrolling of the STE anything will soon be possible."

Andrew Ingram's graphics have been digitised directly from the arcade game using an Amiga. These were then ported across to the ST using Dos to Dos and touched up. Over 80 frames of animation have been included with 7 frames being used in the somersaulting routines alone.



■ The graphics from the arcades were digitised on an Amiga and then ported across to the ST. Using Degas Elite, these were touched up and shrunk down.



EFFECTS

The four levels take you through Red Square, the ice fields of Siberia and a Russian jungle, with magnificent guardians in each. These range from Strider-hungry dogs to a giant mechanised gorilla.

Surprisingly, the horizontal scrolling is smooth and fast – no mean feat on an ST – and this really does enhance the gameplay. Strider's acrobatics have been done brilliantly, so that all his somersaults are perfectly smooth without any hint of jerkiness.

End of level guardians move more sluggishly than everything else so that although they're easily the most impressive-looking of all the graphics they don't have quite the same appeal.

▼ Animation is one of Strider's best assets. Here, he performs a much-needed somersault.



■ Aim for the red eyes because you can't go any further until this thing's gone up.

VERDICT

Strider is a brilliant arcade game and US Gold's conversion has undoubtedly done it justice.

There are a lot of games appearing on the market which incorporate great visuals and a host of impressive sound effects but very few are as playable or as immensely addictive as this latest one.

With a short burst of sampled sound, loads of animation and graphics taken straight from the coin-op, Strider scores well in all departments.

If you're one of those people who enjoy a game which has lots of action and violence then Strider



■ Then you drop down and meet this chap who has no intention of making friends.

is definitely up there with the best of the rest of them. It might not appeal to the strategists out there but who cares—a bout of blasting is far more fun and a lot less taxing on the brain.

Mark Higham

GRAPHICS	8
SOUNDTRACK	6
INTELLIGENCE	2
INSTANT APPEAL	9
LONG TERM INTEREST	7

OVERALL 92%

ARCADE ACTION

What made the Capcom arcade game a hit was the brilliant visuals and US Gold has tried hard to make sure that ST owners get the same good deal. The background graphics and all the animated characters look remarkably similar to the coin-op, with the guardians seeming as ferocious as they ever did in the arcades. Unfortunately the graphics are smaller and their viewed through a smaller window, which does make the game seem less appealing than the coin-op but this has been more than compensated for by the game retaining most of the great playability of its arcade parent.

Having set eyes on the Amiga version – which admittedly has larger graphics – I can say that the ST game definitely has the edge in the playability department.



■ Strider was a mega-arcade game and US Gold's conversion looks like it will be just as successful on the ST.



■ The giant mechanical guardian takes a lot of beating, made all the worse because he insists on firing at you.



■ Take out your sword and aim for his head...



■ He needs to feel your steel before he vanishes.



■ Get to the Siberian wastes of level two and the enemy becomes Strider-hungry dogs.



■ Make a sharp turn ready with your sword...



■ And they go to smoke. Now go back for extra weapons...



■ Strike the capsule and it changes to a sword...



■ You've got the long sword – the best of all the extras.



The Nazis were very strange people. They had squadrons of Messerschmidt 109s patrolling the skies above his factories, rocket ships on the moon extracting minerals – and then used a zeppelin to kidnap Professor Otto Barnsdorf, world-renowned rocket scientist, from his home in Washington DC.

Fortunately, this gives Rocket Ranger (you) time to take off from his Fort Dix base and intercept the great gasbag (the zeppelin, not the professor) mid-Atlantic. This is your



■ The War Room at Fort Dix, where you plan your campaign.

first task in the game. If you fail, the Nazis may succeed and transporting Barnsdorf and his lovely daughter Jane to the moon, where he will be put to work furthering the Nazis' plans for global conquest.

Indeed, those Nazis are going to keep you pretty busy as you roam the world collecting the five parts of a rocket you need to get you to the moon. Only then can you destroy the Nazi base where they mine the precious lunarium that forms the source of their power.

Back at Fort Dix you can plan your campaign in the war room, where you can organise resistance and direct agents as you try to stem



■ Pursuing the Professor's kidnappers. Don't hit the Zeppelin...

the evil Nazi tide. From time to time these agents will sent back little bits of intelligence which will help you to locate the essential rocket parts.

Of course, the Nazis aren't going to give these up without a struggle, and to get to the enemy's strongholds you'll have to battle your way through squadrons of marauding ME109s, blasting them out of the sky with your trusty radium pistol. Once at your destination, there are thuglike Nazi guards to fist-fight your way past before you can get at the essential rocket bits.



■ Closing on the Zeppelin. Remember, don't hit it!

EFFECTS

The graphics are certainly pretty enough, and designed to rekindle lump-in-the-throat feelings of nostalgia about those vintage Rocket Ranger films (even though you were probably minus thirty years old at the time). Animation of the ST version is sluggish, and the more Messerschmidts there are on the screen at once, the slower it gets – add the continuous stream of bullets from your radium pistol and at times the whole lot looks like it might sieze up completely. The soundtrack is a jaunty 30s-style affair which sounds more like a cinema piano than an electric guitar – but only just – while the

ROCKET RANGER

CINEMAWARE/MIRRORSOFT – £24.95



■ You hit the Zeppelin

sound effects accompanying your pulsating radium pistol and the motors of marauding Messerschmidts are functional rather than inspired.

VERDICT

Rocket Ranger makes a great interactive demo, but as a game it lacks real depth and immediacy. There is a lot of tedious disk swapping (the game comes on three disks) and a lot of time spent staring at message boxes

you already know off by heart while the machine loads up the next batch of screens. The action

sequences are few and rather crudely executed, while the strategy element is just that – elemental. Wonderful to look at, but that's about all.

Rod Lawton

GRAPHICS	7
SOUNDTRACK	7
INTELLIGENCE	7
INSTANT APPEAL	5
LONG TERM INTEREST	6
OVERALL	73%

THE MAGIC OF CINEMAWARE

Cinemaware is a California-based company primarily programming for the ST, Amiga and PC. Its products have always been renowned for incorporating some of the best visuals seen on an ST, as demonstrated by *Defender of the Crown*, *Sinbad* and *The Throne of the Falcon* and, more recently, *King of Chicago*. Unfortunately, they've always required at least two disks to operate and because of the structure of Cinemaware games, the amount of disk swapping is way over the top.

Defender of the Crown was Cinemaware's first game and it was an instant hit because the visuals were way ahead of their time. Although there's a lot more competition now, Cinemaware is still striving to keep at the forefront of game design, at least as far as graphics and animated sequences are concerned.

All its games are centred around a static main playing-screen which has options that lead off to loads of interactive sequences. These have got better and better over the years with *Rocket Ranger* being one of the most active. *Lords of the Rising Sun* appeared on the Amiga several months ago and the sequences included in that made it a certain Format Gold. With the ST version promised early in the New Year we may well see it being their most ambitious project to date.

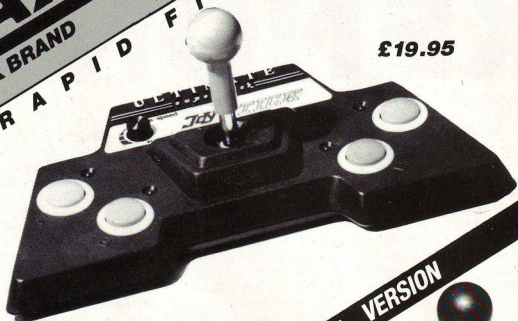
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XENON 2



MIRRORSOFT – £24.99

The Bitmap Brothers are back with a follow up to their first major game, *Xenon*. And since *Xenon*, their egos have grown – the opening sequence to the game is way over the top.

It seems thousands of years have passed since the Xenonites were defeated in the last galactic wars. During that time, they've been plotting their revenge and the method that they've decided on involves five time bombs.

There are five vertically scrolling levels to battle through, each one set in a different time. The inhabitants of each time are of a hostile nature and to their utmost to bring your life to an abrupt end.

Aliens are of two basic types: landscape-based and flying. Landscape-based aliens are part of the landscape and move with it,

whereas flying aliens move all over the screen in their murderous endeavours.

Shooting aliens has advantages other than satisfying your blood lust – money. Dead aliens leave cash behind and you just have to fly over it to collect it.

As usual you do have a means of protection, in the form of a forward firing laser, but to stand any real chance you'll need to build up your arsenal. From time to time



■ Caterpillars cause lots of damage if they hit you and even more before they die.

pod-like objects appear on-screen and if you shoot them a capsule will be released. Collecting the capsule will add to your firepower or defences. Extra weaponry includes smart bombs, cannons, side shots, back shots, huge lasers and double shots. Energy can also be collected in a similar way.

Half way along each level and at the end there's a shop where you can buy or sell equipment using your hard-killed-for cash. There are 29 add-ons for your ship, which range in price from 200 to over 5,000 units of currency. The cheapest is advice, which gives you a recommended add-on to help you through the next stage of the game.

Before you get to the shop at the end of the level you must defeat the obligatory guardian. Masses of firepower is needed to blast your way through. On later levels there are guardians at the mid-point of the level too. When a guardian bites the dust it leaves behind it loads of cash – and you're gonna need it to buy those valuable armaments.

EFFECTS

Bomb the Bass were drafted in to do the music for *Xenon 2* and you can take that as bad or good depending on your musical taste (i.e. whether you have any taste or not). A sample is played initially and then the ST sound chip kicks in part way through the load – and you'll notice when it does. All this is part of the Bitmap hype loading



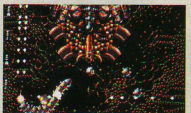
■ Golden blobs explode when you're around but you can defeat them.



■ Super Nashwan power can be bought and gives ten seconds of destructive power.



■ Shooting pods produces capsules and the 'Z' capsule zaps everything on screen.



■ A mean and massive insect needs lots of blasting but side shots make things easier.



■ The game is just beginning, and you have nothing but a single laser. The capsule down below is a speed-up which gives you a better chance of survival.

THE BITMAPS

Mike Montgomery, Steve Kelly and Eric Matthews are the Bitmap Brothers, probably the only programming team most have heard of. What this goes to prove is that no matter how good a game you produce you still need to promote yourself to get recognised, and after seeing the opening sequence for *Xenon 2* you'll know that the Bitmaps go in for self-promotion.



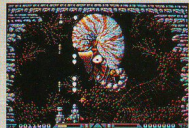
Xenon 2 is the Bitmap's third major release: previously there were *Xenon* and *Speedball*. *Xenon* caused quite a stir when it was released in 1987 by Melbourne House. It was a fast and furious shoot-'em-up with excellent graphics and sound and the traditional assortment of bolt-on weaponry.

Their first project for Mirrorsoft was *Speedball*, a violent futuristic Rollerball/ice hockey game released last year. *Xenon 2* is more of a return to the original theme of vertically

scrolling shoot-'em-ups but the programming wasn't done by the Bitmaps. Instead, they came up with the game concept and oversaw the entire project from graphics to guardians while the programming was done by Assembly Line.

The code for *Xenon 2* was written on an IBM machine and then ported across to the ST. Mark Coleman, the same guy who did the graphics in *Speedball*, came up with the astounding visuals. These were designed using both *Degas Elite* and additional animation routines written by Mike.

The Bitmaps have been signed up to write a further two projects for Mirrorsoft. Although no one is prepared to let out details about these, Eric Matthews guarantees that their next project, although boasting lots of new ideas will "still contain elements of what the Bitmaps are all about", i.e. be arcade orientated. Steve and Mike have been working on this since the release of *Speedball* so it looks like another mega-game. Mirrorsoft may well be letting out details of this new project at the PCW show but we won't see it on the shelves until early next year.



■ The level one guardian takes lots of hits to die...

routine. Eventually you'll get to the game and can turn off the music if you want too. Sound effects are very good and they'll probably drown out the music anyway.

The parallax scrolling is smooth and animation is excellent. Speed remains constant, even when there are lots of things on-screen, and after a few levels you'll have a barrage of firepower blasting away all the time and things will still be fine. One inconsistency, though, is the way the background stars move faster than the foreground landscape.

VERDICT

Shoot-'em-ups have been done to death over the years, so it takes a lot to make a good one. *Xenon 2* is extremely addictive and exciting, so that even though it might not



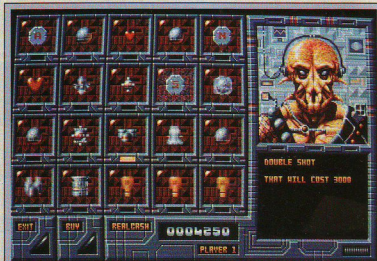
■ and when he does he leaves behind loads of cash.

have any new concepts it's still a great game. Brilliant end-of-level guardians, strap-on weaponry and hordes of aliens are all boosted by superior graphics to make it one of the best vertically-scrolling shoot-'em-ups around.

It's in the same elite class as *Blood Money* so if you are a shoot-'em-up addict then look no further.

Gary Barrett

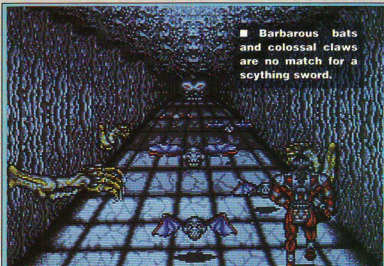
GRAPHICS	8
SOUNDTRACK	6
INTELLIGENCE	2
INSTANT APPEAL	9
LONG TERM INTEREST	7
OVERALL	90%



■ A stop in the shop is essential to stock up on those vital extras. Double shots are expensive, but level two is almost impossible without them.



■ Blasting a wave of aliens makes them drop their load... of cash which you'll need in the shop.



■ Barbarous bats and colossal claws are no match for a scything sword.

CASTLE WARRIOR

DELPHINE / PALACE - £19.99

The king has been poisoned by the evil wizard Zandor and as the king's guards are away on a day trip to Blackpool the task of capturing and obtaining an antidote from the foul necromancer falls on you, Edred the Brave.

Play begins as you run down the Corridor of Death, viewed in 3D from a vantage point just behind your warrior. You must duck, jump and dodge the skull-faced bats that fly towards you and the grabbing claws that lunge out from the corridor walls, or use your trusty broadsword to hack

floating on his throne clutching that elusive poison antidote. Here another bout of jumping ducking and hacking ensues, this time viewed from the side, as Zandor zaps you with an assortment of spells while you attempt to get close enough for a good swip.

With Zandor dead and the antidote safely captured you must return home on the back of a dragon in a simplistic medieval form of *Afterburner*.

EFFECTS

Castle Warrior combines good music and effects throughout with very good quality graphics and excellent use of colour. However, the 3D effect is often indistinct and can lead to unnecessary deaths. To add to this, the joystick response was frequently sluggish.

VERDICT

Despite the many different sub-games, *Castle Warrior* felt very repetitive - if not tedious - and offered nothing new. Another example of good graphics and sound without good gameplay.

Dave Packer



■ Bat back the balls with your broadsword to beat the gargantuan golden snake.

them into oblivion. Once past these foes you have to face the Green Giant and Golden Snake, who can only be killed if you use your sword to knock back some of the fireballs they shoot at you.

Once past the Corridor you must kill a fearsome dragon to gain access to a boat and the subterranean river.

Paddle down another 3D section dodging rocks, deflecting stalactites and killer fish with your shield, and its on to another spear fight with a menacing monster.

Once through the terrors of the Castle you must face Zandor

GRAPHICS	9
SOUNDTRACK	7
INTELLIGENCE	2
INSTANT APPEAL	5
LONG TERM INTEREST	3
OVERALL	43%

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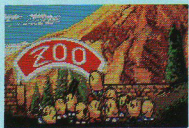
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NEW ZEALAND STORY

OCEAN - £19.99

Cute is the only way to describe the feathery hero of Ocean's latest game - you play a little yellow kiwi. Kiwis are normally big and brown with a long beak, but this is evidently a mutant kiwi that bears a closer resemblance to a chick than anything else. Nevertheless it's cute and feathery and that's what counts.



■ A naughty kiwi sits down for a quick nap.

New Zealand is not surprisingly the scene of the action, which revolves around the kiwi hero and his attempts to rescue a caged kiwi companion. You're armed with a little bow and have to leap and run around the platforms evading or shooting some equally cute opponents. After a while you'll find your feathered friend and after a little flutter you go on to the next level where you have to rescue yet another birdie.

Life would be simple if it wasn't for the other inhabitants of New Zealand, who seem to have a pathological hatred of cute.

yellow flightless birds. Your foes include little boys wielding boomerangs that do come back, bats that drop things on your head, bears riding teddy bear heads, snails and owls on duckback.

At the end of every fourth level there's a tougher opponent to deal with, and then it's off to another New Zealand city for more platform-leaping frolics.

Some sections of the game are underwater and the fearless feathered fellow is forced to don snorkel and mask. Oxygen is slowly used up while you're underwater and so you have to periodically surface for another lungful of air. Running out of oxygen has fatal consequences.

Extras can be picked up to help you in your quest, like bombs and letters which are worth bonus points. When you shoot the nasty horrible people that

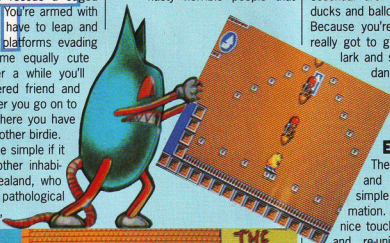


■ No kiwi would ever go anywhere without his snorkel - but watch out for that underwater beastie who's out to get you.

get in your way they turn into fruit (!) which you can also collect for points. Other things that prove essential are teddy bear heads, ducks and balloons. Why, you ask? Because you're a kiwi and never really got to grips with this flying lark and so need more mundane methods of aerial transport.

In some ways it's reminiscent of *Bubble Bobble* by Firebird, with the platform jumping and monsters turning into edible substances - but that's something in its favour, *Bubble Bobble* was an excellent game. Pack away the mindlessly violent part of your nature and get into some serious silliness.

Gary Barret

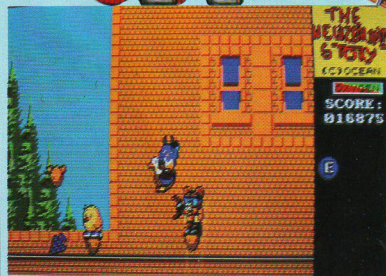
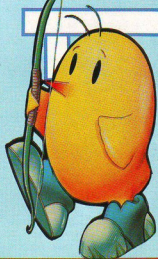


EFFECTS

The sprites are nice and wholesome, with simple but effective animation. There are plenty of nice touches like the snorkel and re-uniting of the little birds. A tune plays throughout the game and although not the best bit of music ever heard on an ST it's good enough. Sound effects are good, especially when you lose a life - a distraught series of chirps are uttered from the injured bird.

VERDICT

Everything about the game radiates cuteness, from the little boys throwing boomerangs to the little chirp that you utter when you lose a life. It's rare for an arcade conversion to be good and playable, but the utter cuteness of the game along with the infuriatingly addictive gameplay combine to make it excellent fun.



■ Beware of teddy bears and duck-riding owls on your rescue mission. (Above) Little boys on teddy bear heads give chase to a cute and cuddly kiwi. Leave me alone!

GRAPHICS	7
SOUNDTRACK	6
INTELLIGENCE	4
INSTANT APPEAL	9
LONG TERM INTEREST	7
OVERALL	78%

COMING SOON

Wh this month dominated by the PCW show, soft-ware houses have had a very impressive line-up of games on display. Of course what matters is when all the demos finally turn into half-decent games - it's then that the disappointments begin.

Listed here are just some of those most likely to make it on the shelves by Christmas - but we'll update you on any games which made it in at the last minute.

THE ALSO-RANS

Some games got left out - we felt they weren't worth including.

■ *Gemini Wing* is good as vertically-scrolling shoot-'em-ups go but not exactly going to blow your mind. It's certainly smashed by *Xenon 2*.

■ Then there's *California Games*, with its decidedly 8-bit graphics - though we did think *Games - Summer Edition* was good.

■ *Elite's Paperboy* finally made it in after a ridiculously long wait - but graphics are appalling, sound is a joke and gameplan trivial.



■ Elite's feeble Paperboy

■ And 8-bit graphics, 8-bit sound and the objective of driving around streets in a police car and pressing the fire-button whenever you see someone makes Domark's APB far from exciting.



■ *Titus*, one of the Entertainment International labels, is coming up with a new arcade adventure, *Knight Force*, due out by Christmas. The idea is that you use your trusty sword and anything else you can lay your hands on to do battle with sorcerers and wizards. Large sprites and some great backdrops make it an exciting visual experience.

HEWSON'S HITS



■ *Onslaught* is a role-playing adventure with four arcade sequences: field battles, sieges, defending actions and mind combat. Graphics familiar? They're by Nigel Brownjohn, who was also responsible for the animation in *Verminator* and *Custodian*.

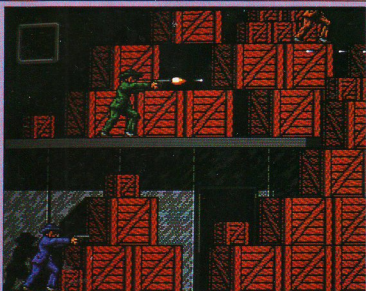
■ You need to collect eight cartridges and position them in relevant places in Hewson's *Steel*. The game is set on a spaceship and the purpose is to shut down computer terminals within a certain time in this strategy action game.

■ *5th Gear* sees you racing round a track, shooting at other vehicles. Do well and you gain prize money for more equipment or even a new car.



OCEANS OF SOFTWARE

■ The mafia-busters get together in *The Untouchables* to bring you five arcade-style sections of shooting action. You control law-enforcer Eliot Ness as he gunsling his way through a warehouse bust, border raids and oodles of violent shootouts.



■ *Chase HQ* claims to be the fastest 3D driving game yet. It sees you sitting behind the wheel of a turbo-charged Porsche as you pursue criminals through city streets, across bridges and dirt tracks. Ocean is looking at *Chase HQ* as a possible contender for the No. 1 Christmas slot.

BATMAN

The guys who created *Robocop* and *Platoon* have been brought in to program Ocean's new *Batman* game. Four levels have been taken from the film: meeting the Joker in the Axis chemical factory, patrolling the streets of Gotham city in the Batmobile, analysing the Joker's nerve gas and the fight to the death in the cathedral. Ocean is promising a release by October.

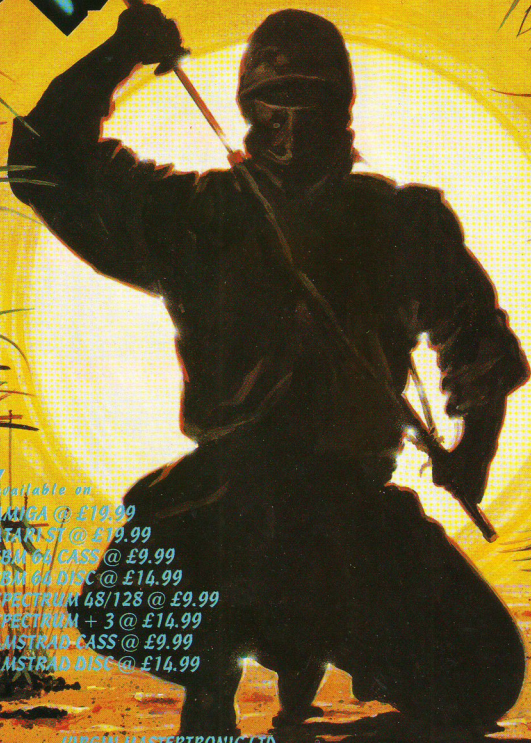


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GAMEBUSTERS

When the going gets tough, the tough get going. And when that doesn't work they cheat. Welcome to the land where cheats always prosper and you can get something for nothing.

BLOOD MONEY

This month's *Gamebusters* opens with a cheat for last month's cover demo, *Blood Money*. To activate the cheat mode simply press the Help key and you'll have infinite lives. Another bonus is that you can gain wads of cash by pressing 1 on the keypad; pressing 4 will take you into the shop where you can buy any weapons you want. Losing a life no longer loses you all of the extra weapons that you have fitted. Thanks go to Scott Willis of West Bromich for the tip.

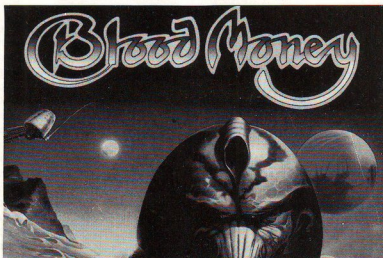


ROBOCOP

Nathan Thomas from Southampton has found a way to keep Murphy from dying in Ocean's chart topping film licence.

Simply pause the game and with the Shift key depressed (isn't it always?) type in ALEX MURPHY. From then on you can recharge your energy level by holding down the left mouse button.

That rotten ED209 hasn't got a chance now – so get law enforcing.



SHACKLED

R. Cheung of London has sent in the following pocket sized tip for US Gold's game of maze exploration and rescue. All you have to do is press the "+" key when you're playing the game and you'll find that you're now on the next level. Simple, huh?

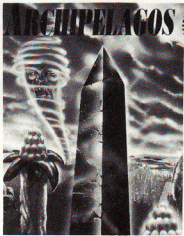
MICKY MOUSE

K.P. Ware-Lane from High Wycombe has sent in a short tip for the Disney adventures of Mickey Mouse.

When playing press the Insert key and type 61315688 and then press Insert again. You can now complete a tower by simply pressing the F3 key. The evil troll king will soon be meeting his maker.

ARCHIPELAGOS

Logotron has very kindly sent in a tip to allow you to select an archipelago from 1 to 9999. Just select archipelago 8421 and Press Return. Hit Return again and you then have a free choice of which archipelago to play.



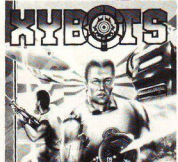
XYBOTS

Mathew Slightam of Woking has come up with a brief playing guide to Domark's blast-a-bot game, *Xybots*.

■ If you manage to reach level 10 you're better off using your radar to kill the Xybots. Just line them up using radar and fire, you don't have to be able to see them.

■ Keep as many keys with you as possible because some levels don't have enough to complete them.

■ There are short cuts to level seven on levels one and four –



you get extra cash for using them.

■ If you have the extra energy upgrade try not to let your energy fall below 100m, because you lose the upgrade if it does.

■ Drums are not just decoration – hide behind them when possible and use your zapper near to them to find more cannon power.

■ On level eight, near to the top left hand transporter you can get to the two white coins by blasting away one of the three walls around them.

■ Don't split up in the two-player game, because it's easier to complete it together.

■ The master Xybot lives on level 11 and you'll need to stock up on double shot and extra shot speed to stand a chance of survival.

■ Try to get one Xybot to stand behind another – they'll blow each other apart.

A PLEA FOR HELP

If you have tips or cheats for any of the following games then send them to us now at the usual address.

BLOODWYCH

LICENCE TO KILL

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ST MUSIC MATRIX

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RICK DANGEROUS

Matthew Slightam of Surrey has donned his dangerous hat to help all those prematurely dying Ricks out there get through the earlier levels of Firebird's adventurous game.

Scene One

On the last fall pull left avoiding the caveman and boulder. A time bonus is awarded if you do it quickly enough.

- Use dynamite to deal with the first caveman.

- Go down the ladder and avoid the caveman. Don't kill him - you'll need the bullets and dynamite later.

- Dispose of the next caveman with a bullet and then fall off the ladder next to the dart-spitting head.

- Jump down to the next platform and go down to the left avoiding the spikes. Collect the head, jump down and go left. On the next platform go to the edge and jump off while pulling the joystick to the left.

- You should land on a stone platform. Count to ten quickly and jump down the left-hand passage.

- A caveman will be to the right of you, shoot him and collect the head.

Scene Two

Shoot all of the cavemen before they get to the bottom of the screen and collect the head. Go to the bottom left hand corner and you should hear a ping. Leave by the top right hand corner.

- Kill the caveman with dynamite and pick up the bullets. Jump down the shaft and keep pulling left until you hit the ground.

- Jump straight down the next passage, NOT onto either of the platforms.

- Shoot the bat and fall down to the next room. Pull to the left on the next passage until you hit the ground.

- Collect the head and go right avoiding the spikes.

- Blow the wall away with dynamite and then go to the next room and blow away both piles of stone.

- In the next room jump onto the bottom left hand corner head. Jump on the head to the right and climb up the wall to get the head. Jump down onto the

platform.

- Climb down the ladder a bit and fall to the right as there is a dart here.

- Go next to the falling trap and it will fall. When it rises again go under it.

- Fall down, collect the dynamite and shoot the guard.

- Run to the right and get ready to jump down the passage. Don't jump down when the cavemen run away together, wait for them to run one by one and then shoot them.



Scene Three

Go down to the next room and go right. Using dynamite blow up the stones and move onto the next room. Fall straight down and then press the stick to run left. When the block moves on to its next position, jump from it onto the platform. This gets rid of the left hand spikes. Jump up and press the other spike. Now go to the far right, wait for the block to slide into place and then move on.

- Don't bother with the caveman at the bottom, just jump onto the next platform and kill the caveman with dynamite.

- Go up the ladder and straight into a crawl. Get the head and crawl back past the top of the ladder and go up.

- Jump on the head, jump again and kill the caveman. Go up the ladder and wait until you can see two cavemen. Jump over and to the left so that they fall and plant some dynamite. Fall down the hole and they should get blown up.

- Go to where you first spotted them and go onto the first step, which makes the caveman fall. Shoot him and go to the top step. Jump up and down and a caveman from further on will fall down. Go up the ladder and avoid him.

KULT

Paul Coombs of Abercynon helps continue the player's guide to Ere's arcade/adventure by providing a solution to the problem of the Scorpion's Presence.

Click on the square bit of the statue and select pray. You'll now be able to enter the door ahead, so click on it and enter. Click on the webbed floor and select crawl, and you'll be in front of the mistress. When she asks you for a present give her the fly and she will then ask you to feed a tarantula. Feed a blue one and she'll give you a red one. Click on the door to leave again. Put the red scorpion in the mouth of the statue and a trap door will open. Enter it and you'll be given a skull.

Take all five skulls to the guard and you can become a divo and will be allowed to advance to the next stage of the game.

NIGHT HUNTER

Harry Maton from Croydon has been having a wonderful time in UBI Soft's vampiric game. He's spent many a long night sucking blood - and the result is a gourmet's guide for all blood suckers.

The most lives (or should that be unives?) that you can have is nine, and one is awarded every 50,000 points. To build up your

lives stock, collect all objects but one and then go on a bite and suck frenzy, returning to your comfy coffin in the crypt before sunrise. The crypt only opens when the sky begins to lighten and the birds begin tweeting.

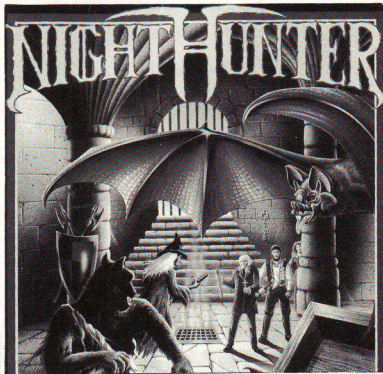
When you're out for blood, try to stand so that you're half on and half off the screen. The advantage of doing this is that you have more time to duck when eagles appear and your adversaries also drain your energy to a lesser extent.

If the police and archers are giving you problems, simply change into a bat and fly to the bottom of the screen - they'll ignore you.

Religious fanatics (women with crosses, probably called Jane) can be chased away if you turn into a bat or werewolf. When they're running change back to the hunky vampire form and give them a love bite from behind.

When possible you should leave objects in the pen as near to the portal to the next level as possible. The reason is that when you leave a room with the last object, that good-for-nothing Van Helsing is waiting outside with a stake - and you know how vampires feel about pointy sticks!

I've got to go now, I fancy a nibble. Now where did I leave my toothbrush?



WINNERS BOX

Another month comes to an end and still there are people out there waiting to be saved. Don't be mean - share your wisdom with these poor helpless souls by sending in your tips, pokes and playing guides, and we'll send you a little something through the post. (Anybody want a Tribble?) The month's best tip will win its brave owner a prize. Send those tips and pokes to: Gamebusters, ST Format, 4 Queen Street, Beth, Avon BA1 1EJ.

Prize winner this month to Matthew Slightam of Woking for his Rick Dangerous and Xybots tips.



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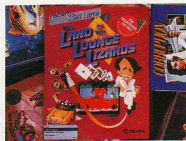
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CAPCOM



OPEN THE BOX!

Adventures form one of the oldest computer game genres of all – remember the original text-only *Colossal Cave Adventure*? Things have moved on a little since then, with ever-better graphics, ever-expanding game-playing areas and ever more varied scenarios. Here are just a few modern-day adventuring classics...



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Larry marks a shift from the traditional gnome-bashing, treasure-collecting gothic plod so beloved of traditional adventurers. You play the role of a frustrated bachelor and accomplished nerd embarking on a quest for – for want of a better word – love. Sierra's original adventure has picked up a bit of flak over its questionable taste, but it really is great fun.



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The topical business of insider dealing forms the basis for this upmarket adventure from Magnetic Scrolls. You have been made partner in a City broking firm and you've been given a new car, new office and new secretary. However, all is not as it seems – you soon find yourself the unwitting pawn in the machinations of unscrupulous colleagues involved in shady deals.

PAUL RIGBY looks at origami galleons, radiation badges and chewing gum, and the multitude of other goodies while listing his favourite games

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If you think the title is odd, wait until you play the game! Cast in the



role of an investigative goldfish currently residing in a glass bowl, it's up to you to save the world from the Seven Deadly Fins, a group of interdimensional anarchists. Fish! starts off strange and gets ever stranger. It's highly entertaining and extremely original.

THE HITCHHIKER'S GUIDE TO THE GALAXY

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The most mind-bogglingly silly story by Douglas Adams in its computer adaptation. Guide Arthur

Dent on an interactive escapade through the galaxy. Meet characters like Ford Prefect, Trillian, Zaphod Beeblebrox and Marvin.

Don't panic, it's one of the funniest adventures you're likely to chance upon. The text-only adventure is dated now, but is as fresh as the early radio series of the same name. If you haven't got this one, you haven't adventured.

LEATHER GODDESSES OF PHOBOS

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In the best of Infocom tradition, *Leather Goddesses* provides stimulating play against voluptuous Martian fiends determined to turn Earthlings into sex slaves. How many uses can you find for a rubber hose? Is it easy to remove a



tion. And if you're a prude there's a playing mode for you: Tame. Give me Lewd any day!

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If you want a game with lots of zany humour, weird problems to solve and an abundance of silly characters, then look no further.

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The Perils of Rosella is the fourth in the *Kings Quest* series. Sierra games are different to most in that they have animated 3D graphics. Your actions are shown on screen, adding to the enjoyment of the adventure. As a special bonus you can win a trip to England (?) – well, it is an imported game after all.

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FREEBIE FEAST

So you've just bought yourself a new adventure by Magnetic Scrolls?

You've torn open the box in a frenzy of excitement, and...chances are it'll taken you ten minutes just to extricate the disk from the freebies. Gone are the days when all you got was a novella and a registration card. The weird and wonderful objects enclosed with just about any adventure package these days provide almost as much entertainment as the games themselves – but who actually designs them? And why?

Richard Garrin – Lord British himself – of Origin Systems explains how some freebies just cry out to be included:

"In *Ogre*, for example, there are real, honest-to-goodness, radiation detection stickers. We got them from a medical supply place.

The freebies don't always have to fit in with the game. It can be the other way round. A. J. Redma of Lucasfilm...

"The *Indiana Jones* adventure game that we're doing comes with the *Grand Diary* that Henry Jones uses in the film: it's a very significant game element because in the film it's an item he uses to solve lots of puzzles. When that came up it was a natural. We already knew that we were going to make the game when we saw the *Diary*, but we realised that it was going to be a significant element."

One of the more original freebies has been the newspaper in *Zak McKracken*. A. J. Redma explains where the idea came from:

"Well a lot of that we actually got from real newspapers. We spent a few months reading through the tabloids and we got several ideas from that and had lots of fun doing it."

Could Infocom's Rob Sears provide any similar little gems? How about the smells from the Scratch 'n' Sniff card in *Leather Goddess of Phobos*?

"A lot of that's essences that are available off the shelf. So it's just a question of pinpointing what you want. So you might say, 'Weeell, wanna pizza'."

How about the piece of fluff in *Hitchhikers Guide to the Galaxy*?

"It's just fluff, random fluff." There were also some favourite items which never made it into the box.

"Recently, for *Shogun*, we wanted to put some Origami in the package but it became a production nightmare. We were hoping to produce an Origami ship – the Erasmus.

Which was, of course, the ship *Blackthorne* arrives at Japan in."

Anita Sinclair of Magnetic Scrolls has her own favourites,

"Oh, we wanted a pop-up fish in *Fish!* Where you opened the *Fish!* box and this exploding fish came out, and hung around. You can get these tiny plastic things that you can put in water and they turn massive. We wanted a fish made out of one of those. We also thought of selling it with a dead, dry goldfish – that was a fairly good idea. In the *Guild of Thieves* we wanted to have some chewing gum. We were actually going to do this until we realised that we would have to have a sell-by date on the packaging..."

So do the trinkets, promotional items or whatever you call them, help sales?

"I don't know. I've never bought a product because of its contents. I've bought the product because I've wanted to buy the game."

Kirk Green of Sierra added:
"If you have a well thought out and unique promotional item, it will catch somebody's eye. But I don't know whether it actually spurs sales. I think that it adds to the whole environment and the whole fun of playing the game. You've got more than a couple of disks and an instruction booklet, it's a little extra fun thing

that gives it a little more real life feeling."

They may be called 'freebies', but surely someone, somewhere along the line pays for them? Rob Sears of Infocom:

"I think it could add to the price. Obviously, there's a perceived value issue here."

Would Lucasfilm ever produce a cut-down, no-frills version as a cheaper alternative?

"We would never consider releasing a stripped-down version. For us it would go against the philosophy."

Anita Sinclair took a different viewpoint.

"Absolutely yes, in the answer to the cut-down version, watch this space. I think the *What Burglar?* in *The Guild of Thieves* is brilliant, I think the *Independent Guardian* in *Jinxter* is superb, the filofax in *Corruption* is great. I think they add an enormous amount. I think that the *What Burglar?* in *The Guild of Thieves* is just fantastic, it really is. Reading it even now, I laugh at it. It's just wonderful. I don't actually believe that things like the credit card adds anything to the game and I think we could strip the product of those goodies and put them out at a slightly lower price. That's something we would like to do."

NOVEL VIEWPOINTS

Amidst the plethora of widgets, keepsakes, novelties and joke items that fall out of adventure packaging, the good old novella remains standard issue for many releases. Level 9's Mike Austin likes novellas:

"Peter McBride writes them, we like his writing style. We give him the plot synopsis and then we ask for a related storyline. We feel the novella helps to get a feeling for the setting, even if the game must, finally, stand alone."

Anita Sinclair doesn't:

"I think they're ghastly. That's why we've never done one since *The Pawn*. I think they're absolutely vile. I mean, they're written to go inside

computer games but people who buy computer games want to play computer games, they don't want to read a novella. If they want to read I'd advise them to pay £1.95 and buy a sensible paperback. I can't understand the point of them all. We put one in *The Pawn* because we didn't have the confidence or the imagination to do something like *What Burglar?*, which came in *The Guild of Thieves*. But we would never, ever, ever, ever do a novella again..."



■ Mike Austin thinks novellas "help the setting".



■ Anita Sinclair thinks novellas are "ghastly".



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SONIC ATTACK

W T SMITH and B J CAPEL continue their GFA BASIC series by explaining how to add that vital finishing touch to your games - music and sound.

Sound effects are the most neglected part of computer games writing, and yet in many respects they are the most important. It's hard to say how many good games have been spoiled by the lack of good sound effects, but it's certain that many mediocre games would have benefited greatly from their inclusion. Certainly, a good sound track can help sell a game - this was particularly true back in the C64's hey-day when Rob Hubbard produced some very original, driving beats. It seems those days are returning with ever-more importance being attributed to in-game sounds.

Film producers have proved the point. In fact they go to great lengths to hire the best composers, to ensure that the right music is chosen to set the atmosphere, and even ensure that hidden in the background there are people chopping cabbages and rattling coconuts - the sound effects people making a tidy living out of low tech sound reproduction.

Fortunately, we don't have to go to these extremes to produce sounds. The Atari ST is fitted with a sound chip capable of producing a wide range of exciting noises very easily. How easily? read on and be enlightened!

THE ART OF NOISES

GFA BASIC's high-level sound commands are detailed in the box on page 99, but there are also a couple of other methods for creating music, zaps, bangs and crashes on your ST. One is with those mysterious and extremely useful Xbios commands, and the other is by replaying sound samples.

So, let's start by taking a quick look at what is involved when you use the two routines GIACCESS (XBios 28) and DOSOUND (XBios 32).

XBios 28

This is the simplest of the two low-level access sound commands and is used to read or write a value directly to or from the sound chip.

As mentioned before, care must be taken when using this

command to alter the value of register seven (the two high bits must always be set).

The format for this command is $A\% = \text{XBios}(28, X\%, Y\%)$

A% is used to hold the value of the register when reading.
X% is the value to write.

Y% is both the register number and the read/write flag.

To read the register, Y% is just

noise register:

$A\% = \text{Xbios}(28, 1, 6)$ - will return the value 15 in A%

XBios 32

This is the most powerful method for extracting melodic gurgles from your ST from within GFA BASIC, and this power will allow the playing of full tunes under interrupt. That means quite simply that the

```

Save   Save, A   Quit   New
Load   Merge   List   Block
WINDOWS FROM BASIC DEMO PROGK
ORIGINALY IN ST BASIC
WRITTEN BY JIM LUZAK FROM ST-
CONVERTED TO GFA BASIC BY
JASON BUCHHEIM
SEE HOW MUCH SHORTER IT IS IN
WRITE FOR MEDIUM RES
@Wdelete(1)
@Wdelete(2)
@Wdelete(3)
@Wdelete(4)
set up screen
Rezz=Xbios(4)
If Rezz=2
  Ho=2
  No=2
Else
  If Rezz=1

```

■ The GFA BASIC 2 programming environment, given away free on Cover Disk 1, from which you can create sound effects and play sound samples.

the value of the register, and to write, Y% is the register number plus &h80 (hexadecimal 80 is the same as 128 decimal).

Example: to set noise register to 15:

$A\% = \text{Xbios}(28, 15, 6 + \&h80)$

Example: to read value of

action of your program will run simultaneously with the sound. The tune you want to play is placed in a buffer, and the Xbios call is told the location of the buffer containing the tune, which is represented by a series of control bytes. Full details can be found in the excellent book

GFA BASIC: Advanced Programming.

NOISE FACTOR

GFA have recently released the software development manual to go with GFA BASIC 3. The manual has special sections on Line-A commands, AES functions and GDOS, all designed to encourage the user to exploit far more of GFA 3's less popular instructions. Well worth investing in.

The manual is designed to appeal to the dedicated programmer who is particularly interested in obtaining fast code or in using GEM applications. The AES section contains lengthy examples of using dialog boxes and how to create your own icons, both of which are poorly represented in the Basic manual.

The book is made up of many useful examples of the routines in action and a program disk can be purchased which contains all the programs listed in the manual. So why do you need to know all this? Well, there's a very useful listing in the book that takes all the drudgery out of creating sound effects and noises. To a large extent the SOUND and WAVE commands require a lot of experimentation before any reasonable sounds will be produced. That's why a program that lets you manipulate the commands quickly and easily is very useful.

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ON THE DISK

This month's cover disk has two demonstration programs for sound: one using the sound chip and the other a digitised sample. Something for everyone! The programs can be found in the root directory of side two of the disk.

To run the programs, first click on NEW and then MERGE. Choose the relevant filename from the file selector box and click on OK. Click on RUN and away you go.

30SOUNDS.LST has a large assortment of sound effects to choose from. All you have to do is type in a number between 1 and 31 corresponding to the sound you want and press Return. To quit the program, press Ctrl, Shift and Alternate.

SAMPLE.LST is a short routine that can be used to play back digitised samples in your own programs. The file BASCODE.EXE is needed to playback the sample. Do note that the sample to be played is specified by the filename SAMPLE1.SPL.

You must specify Speed% and Length% if you use a different sample, and the array B% must be the length of the sample divided by four (integer variables use four bytes of storage, hence the reason to divide by four).

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SOUND SAMPLING

Nowadays, when you load in a game, the chances are very high that you will be greeted with a nice loading screen, and what sounds like recorded music playing. This music is recorded, not in the way you would expect, but with a piece of hardware, (usually a cartridge), plugged into your ST. The sound you want to record is fed into this box, which converts the analogue signal into 8-bit digital samples.

These samples, which can be reproduced by the sound chip in your ST, are simply blocks of binary 0's and 1's which produce clicks in a similar manner to the way in which a radio speaker achieves the same result.

The main difference between using a block of data which produces a tune, and a block which produces sampled sound, is the speed at which the data has to be sent to the sound chip. GFA BASIC, or any other BASIC come to that, is simply not fast enough to do the job, so a machine code routine is needed.

This machine code routine, apart from providing the speed, also has to do some conversion work, because the bit resolution of the sample is 8-bit data, and the ST's sound chip has three 4-bit channels. This is done with a look-up table in the machine code.

The example GFA BASIC program on the cover disk, SAMPLE.GFA, uses a piece of code which is supplied with the 2 Bit Systems *Replay* sampling cartridge, the sampler that most users regard as the best currently available.

This code will play your sample and then return control to your BASIC program. Also available is a piece of code that will play samples while your BASIC program is doing other things, but you'll have to buy the *Replay* cartridge to get hold of it!

Another program on the disk, (space permitting), is 30SOUNDS.LST, a demonstration of game sound-effects (some of which the game players amongst you will recognise) which utilises the DOSOUND call.

The capabilities of the ST working with GFA BASIC for utilising sound are quite extensive. An article this size cannot do, for example, the DOSOUND justice, as well as fit all the rest in. If enough readers request it, maybe we could take another, more in-depth look at a later date on some of the subjects covered.

■ Using GEM from GFA BASIC next month. Don't miss it.

Sounds Technical

The ST's sound chip can be programmed directly - here's how.

The sound chip fitted to the Atari ST is the Yamaha YM-2149, which bears a striking resemblance to the General Instruments AY-3-8910 - no surprise, since GI designed the chip before selling Yamaha the licence.

The chip has 16 read/write registers which allow the user to produce tone and noise output on any of the three channels simultaneously. Registers 14 and 15 are not used for sound output and register 7 shares some disk drive functions with the tone and noise enable, so special care must be taken when writing to this register. The data registers are listed in the inset panel.

In addition to these hardware registers, the Atari ST has 5 software registers, and these are as follows:

Register 128 - temporary register
Register 129 - value to load into register 128
Register 130 - increment
Register 131 - escape value
Register 132 - delay until next sound is processed

The above is useful information for the more intrepid souls amongst you who intend to use the XBIOS command DOSOUND provided by GFA's comprehensive libraries. GFA BASIC interpreter lacks a music macro language but does provide high-level access to the sound chip by providing two sound commands; namely SOUND and WAVE.

The GFA SOUND and WAVE commands take the following form:

SOUND,channel number,
volume,note,octave,
delay or

SOUND,channel number,
volume,#period,delay
WAVE,mixer,env,form,
period,delay

With WAVE, before any sound is issued, the sound chip must be initialised and this is done by invoking the wave command, so an explanation of the individual parameters is necessary.

MIXER

This parameter directly relates to register 7 of the sound chip, and initialises each of the tone and noise channels. It uses the follow-

ing values (corresponding to individual bits of register 7):

1 - tone on channel A
2 - tone on channel B
4 - tone on channel C
8 - noise on channel A
16 - noise on channel B
32 - noise on channel C

The above values can be used in any combination, e.g.

■ A value of 63 (32 + 16 + 8 + 4 + 2 + 1) enables noise and tone on all three channels.

■ A value of 7 (1+2+3) enables tone only on all three channels.

■ A value of 33 (32+1) enables tone on channel A (1) and noise on channel C (3).

ENV

This parameter specifies which channels are affected by the envelope and takes a combination of the following values:

1 - channel A is affected
2 - channel B is affected
4 - channel C is affected

E.g. a value of 5 gives the envelope to channels A and C

FORM

There are eight different envelopes but only one can be active at any one time. These envelopes affect the shape of the sound and are numbered 8 to 15 as follows:

8 - falling saw-tooth
9 - falling linearly
10 - triangle with initial fall
11 - falling linearly and then rising instantaneously to maximum
12 - rising saw-tooth
13 - rising linearly and then holding
14 - triangle with initial rise
15 - rising linearly, then falling instantaneously to zero

PERIOD

This is the length of time it takes for one full cycle of the envelope to be completed. The value is actually a divisor, therefore the larger the value the more compressed the envelope shape is. Values range between 0 and 8000.

DELAY

This is the time in 50ths of a second before the next sound is issued.

Period and delay interact with

each other, and for the envelope to work properly the delay should be longer than the period if the envelope is to finish its period before the next sound starts. Try the following example:

WAVE 35,2,9,1000,150

This enables tone on channels A and B, noise on channel C, the envelope affects only channel B, the envelope is falling linearly and lasts about three seconds and the next sound command will not start until three seconds have elapsed.

Having set the wave, the next task is to set the sound and, as mentioned above, the sound command has two forms, differing only in that form 1 specifies the note and the octave whilst form 2 combines these into the period of the wave form.

The parameters are:

Channel

1 - enables channel A
2 - enables channel B
3 - enables channel C

Volume

0 - 15: 0 is the quietest

Note

1 - 12, where 1 is C, 4 is D#, 12 is B, and so on.

Octave

1 - 8

Delay

As described above...

#Period

This is the pitch of the note and is calculated by the following formula:
#period=trunc(125000/frequency*0.5)

Where frequency is the actual frequency of the note, i.e.

note	octave	actual frequency
C	1	32.7
C	3	146.8
C	4	261.4
C	6	1177.5
C	8	4474.4

Another GFA BASIC example...

SOUND 2,10,4,1,100

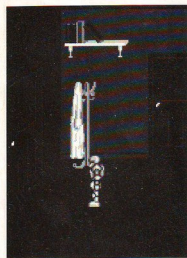
SOUND 2,10,#477,100

Both of these will play note C of octave 4 for 2 seconds.

EDUCATION GAME

MIKE GERRARD starts off *ST Format's* new education column with a round-up of educational suppliers and a review of *Fun School 2*.

Database Educational Software probably surprised itself as much as anyone when its *Fun School 2* series became the first educational program to reach the games-dominated software charts for as long as anyone can remember. Good marketing helped, as the programs themselves, while lively and to be recommended, are no better and no worse than others that are around.



■ *Logic doors* is a maze/exploration game which tests kids' powers of deduction.

There are three versions: for under-6s, 6-8 year olds and over-8s. Each comes with a free badge to enable your child to be a walking advert for *Fun School 2*. Each package also contains eight programs, with detailed notes for parent or teacher. But no one program can claim to be suitable

for every child in the country below the age of six, and it's important that the adult can change the content to make it easier or harder to suit a particular child's abilities. Most of the FS2 programs have three or four difficulty levels built in, and by using a particular combination of keys at a certain stage in the program you can change the level in use.

And for those programs dependent on word lists – like spelling programs – you can amend the list to suit your own needs, and save it.

The eight programs offer a good range of games for a child to play, from testing shapes and colours at the lower end through to logic-testing games for the over-8s. The graphics are large and colourful, with good use of musical and visual rewards for getting things right. There's much use of frogs, trains and teddy bears at the lower end, with robots used higher up – girls might not be so attracted by that.

A couple of improvements could be made. One is that older children may find the games rather slow – or perhaps Database is just hoping daddy will buy the STOS Compiler to speed things up. These programs are all written in STOS Basic, and you can break into them and rewrite them for your own purposes.

The second fault is that there is no monitoring system for the adult to check how well or badly

the child is doing. Some of the programs have an in-built response to the results, whereby the child moves on to a harder level after several successful answers, but apart from that there's no way the adult can leave the child alone with the program and then come back later to see how they've been doing.

Given the open nature of the programs, it shouldn't be too hard to get in there and amend it, but it shouldn't have been too difficult for Database to have done it for you. Database has thought of most other things – good documentation, with sensible advice for adults about the nature of educational programs.

One bug came to light – on level 4 of the *Souvenirs* program for the over-8s, the "Another game y/n?" question always gives you another game, whether you want one or not.

I can already hear the cries of "Miss, it's gone wrong!"



FUN SCHOOL 2

£19.95 ■ All STs ■

Database, Europa House, London Road, Macclesfield, Cheshire SK10 4NP (0625-878888).

WRITING LESSON

If you have any comments on the ST educational scene, questions about specific packages or anecdotes that we think we ought to hear, write to Mike Gerrard, *ST Format*, Future Publishing, 4 Queen Street, Bath, Avon BA1 1EJ.

WHERE TO GO

One good publisher and distributor of educational software is Rickitt Educational Media, Ilton, Ilminster, Somerset TA19 9HS.

If you write and ask nicely, and tell them whether your interest is in primary level, secondary education or both, they will send you the appropriate catalogue.

The comprehensive directory boasts a massive 132 pages of educational programs, but it isn't quite as comprehensive as it first appears as it only lists a few of the many available for the ST. It's still a useful reference to have, however, as some of the programs listed will doubtless be converted for the ST in time, and I for one look forward to the ST versions of *Sex Determination*, *Henri Beret Plays Darts and Sewage Treatment*.

Meanwhile, the following software houses have published educational software for the ST:

BYTES SYSTEMS

19 Southfield Road, Hinckley, Leicestershire LE10 1UA

CHILDREN'S LEARNING SOFTWARE

PO Box 119, London SW14 8BL

H A T SOFTWARE

21 Wyle Cop, Shrewsbury, Shropshire SY1 1XB

KOSMOS

1 Pilgrims Close, Hinckley, Dunstable, Beds LU5 6LX

MICRODEAL

PO Box 68, St Austell, Cornwall PL25 4YB

MIKED

6 Devonshire House, Stonehouse, Plymouth PL1 3HE

SOFTSTUFF

193 Sketchley Road, Barga, Leicestershire LE10 2DY



■ One of the games from *Fun School 2* (the over-8s version). You get a jumbled set of instructions for working a machine, and have to decode the characters.



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Gunship.....	£16.50
Kick Off.....	£13.50
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Licence to Kill.....	£16.50
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Navy Moves.....	£13.50
Personal Nightmare.....	£20.99
Populous.....	£17.50
Red Heat.....	£13.50
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Tank Attack.....	£16.50
Thunderbirds.....	£16.50
Voyager.....	£16.50
Waterloo.....	£16.50
Wicked.....	£16.50
3D Pool.....	£16.50

ART & SOUND

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C-Lab Notator.....	£369.99
Steinberg Pro-24.....	£249.99
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Protex is faster all round; for example the search and replace command is six times faster than First Word +, and the spelling checker, too, is faster.

Protex has all the features you would expect from a good word processor - many text editing commands, print commands, spelling checker and mailmerge. What you might not expect though, is the refinement and thought that has been put in to make Protex ideal for the novice or the experienced user alike.

"To sum up, Protex is probably the most powerful word processor on the Atari ST and is quite likely to become the best selling too"... ST USER 4/88

"...At last one that seems to fit most of what I call essential in a word processor" PAGE 6 #34

"...Extremely good for manipulating and merging large text files". "Wins hands down as the all round package". ST USER 8/88

A brief summary of some of Protex's features ...

Background printing edit/create further files while printer is busy
Box manipulation move, copy, or delete any box as well as blocks
Configuration set over 50 options to your own preferences using our menu driven configuration program
Dictionaries add/delete words to/from supplied 70000 word English dictionary. Create your own dictionaries
Disc utilities copy files, erase, rename, type, create directory, change directory, remove directory, catalogue files store sequences of commands in files for easy use
Exec files flexible file conversion utility for other WP files
Find & replace very powerful and fast with many options.
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Printer support
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FAIR COMMENT

Unfortunately, the British Music Fair didn't produce the expected flood of ST music software, perhaps because some major distributors such as Hybrid Arts and Evenlode/Steinberg failed to turn up for the Olympia show; perhaps because the products were spread more evenly among different machines, with the PC, Amiga, Macintosh and even Archimedes represented just as well as the ST.

The biggest ST launch was Digital Muse's *Virtuoso*. This was claimed to be the first UK-produced pro-standard ST sequencer – what about Iconix, guys? But we won't go into that in too much depth here, since *Virtuoso* is reviewed elsewhere in this issue.

Sound Technology had the most impressive demos, with the latest additions to the C-Lab *Creator/Notator* package. *Human Touch*, a hardware add-on which clips onto the Unitor SMPTE interface, allows you to set the tempo of a piece of music using an audio trigger, line-level signal or external MIDI clock; instead of being limited to a fixed tempo, or a smooth series of tempo changes, the timing of your song can now be all over the place if you want!

One of the most useful applications of *Human Touch* is in synchronising a sequence with a multi-track tape which doesn't have a sync code. Just use the bass drum or other regular sound to trigger *Human Touch*, and record

This year's British Music Fair was the biggest show of its kind –

CHRIS JENKINS was there

the tempo changes into *Creator/Notator*. No matter how sloppy the timing of the original music, your sequence will now keep time. Sound Technology's specialist demonstrated how

size of your ST, you can have up to nine programs resident at once; Sound Tech had *Notator*, *Turbosynth* and a word processor going at the same time, swapping data happily. A better option than



■ Kawai's PH50 preset synth: excellent sound

Human Touch can take its tempo from you snapping your fingers, or just tapping on its case! This is a wonderful innovation at £149, but since you need *Unitor* to use it, the cost mounts up.

Another C-Lab innovation is *SoftLink*, a program-switching shell which works with any software conforming to GEM/MIDI standards. Depending on the memory

Steinberg's *M-ROS*, which only works with Steinberg programs so far.

The Synthesiser Company (TSC) showed *X-OR*, a patch editing program which handles data from over fifty instruments. Priced at £249, but it may work out cheaper and more convenient than buying a separate patch editor for every synth.

One of the most attractive ST products was *ProScore* from Comus, distributed by SoundBits Software. This inexpensive 32-track music notation package (£229.95) runs on one meg STs with mono displays, and looks both powerful and dead easy to use. It coped accurately with notating and replaying a complex boogie-woogie from one of the keyboard demonstrators, and produces good print-outs even with a 9-pin printer, though 24-pin and laser printers are also supported. It's MIDI file standard compatible too.

A lot of interest was concentrated on new keyboards, but with few exceptions everything was 'Mark 2' of last year's products. The *Kawai K1 MkII* was probably the best; added to the fantastic sampled/synthesised sounds of the K1 are a programmable digital reverb, and a bank of drum noises taken from the R-series drum machines. Good value at £695. Also shown was Kawai's K1, using the same technology as the K1 but with more voices, programs, modulations – in fact more of everything; and the excellent PH50, a preset 'home keyboard' version

SPECIAL INTEREST

- Of particular interest to home recordists was the Yamaha FX500, a half-rack 16-bit programmable effects unit boasting six simultaneous effects. Marvellous quality echos, reverbs, distortion, chorus, EQ and so on all from one little black box.
- Cheetah's SX16 MIDI sampler is the first 'affordable' 16-bit quality device, at £799. It's a one-unit rack-mounted instrument with a built-in 3.5 inch disk drive. You start off with a relatively small memory, enough for about 8.5 seconds of sampling, but this can be expanded. There's also an optional extra video interface which allows you to edit samples and programs on a TV screen. The best feature is that the SX-16 is compatible with Akai S900 sample disks, so there's a huge ready-made library of sounds available.

CHEETAH STRIKES

As usual the biggest stir was caused by Cheetah, which regularly promises the best gear at half the price, and sometimes delivers. This time it was an SX-16 sampler; the MQ8, a sequencer with live performance facilities at £250; the MD-16 sixteen-bit sampled drum machine with velocity-sensitive pads, 40 sounds, dynamic tuning and pan and eight outputs, at £300; and the PMC pad-to-MIDI trigger converter, with eight channels and four velocity curves at £150.

■ The Cheetah stand: packed with new products



with many of the best sounds from the K1. While most home keyboards still go 'dink dink dink', the £299 PH50 goes 'GERZOOO-INGGGG!' and has to be heard to be believed. Built-in drum patterns make this an excellent choice if you're on a budget.

Still, it's a more attractive option than Yamaha's V50 workstation, also £999 and offering a keyboard, sequencer, digital effects and drum sounds; but since the instrument sounds are created using the stale old FM technique used on everything since the DX7, who wants it?

Casio's contributions were mainly piddly-doink mini keyboards and up-market sampling modules, but there was a new version of the MIDI horn, the DH-500, with an extended body, more playing keys, and built-in effects.

The Master Series 7P, with seven octaves of weighted keys, velocity/aftertouch/release sensitivity, 100 memories, eight definable keyboard zones, four outputs, MIDI clock and a range of MIDI echo, arpeggio and velocity effects, makes rivals from the Japanese companies look over-iced and underspecified.

Meanwhile, up the road in the London International Hotel, KES Music Services had a real surprise — the Suzuki MIDI Omnichord 200M. A sort of 'digital autoharp', the Omnichord provides single-finger chord and bass patterns with a drum accompaniment, while you play along by strumming the 'sonic string' section — a touch-sensitive metallic strip which produces glissandos of notes in whatever key you happen to be playing. Perfect for non-musicians, its MIDI capabilities make it an interesting alternative to keyboard control in the MIDI studio. The Omnichord 200M should be available from November at around £250.

With a few exceptions, it wasn't a Show for amazing innovations, but both the software and hardware producers seem to be responding better and better to the needs of the consumers — and that's you! ■

NUMBERS TO CALL

Casio	01-450 9131
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Digital Muse	01-586 3445
Kawai	0202 296629
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TSC	01-724 4104
Yamaha	0908 71771

UK ELECTRONICA '89

Each year since 1983, the UK Electronica festival of Synthesizer, New Age and Computer Music has presented the most exciting international performers in the field, in a positive orgy of synths, samplers, drum machines, computers, lasers, lights and videos.

This year is no exception, with the organiser AMP Records promising the biggest and best show ever, featuring a wide range of music which no computer musician should miss.

The ST features heavily on the agenda. French keyboard player Daniel Biry uses Passport Master Tracks Pro software on his ST, together with Ensoniq synths and samplers. He's just released his first CD, *The Feathered Snake*, on AMP Records, and will be performing selections from this and other works.

River of Dreams, a Newcastle duo, have two



sequencer and Fairlight. ■ **Top of the bill is Robert John Godfrey, leading light of cult progressive rock band The Enid, launching his solo career with music from his new album Reverberations, recorded using Steinberg Pro-24 V3 and a huge selection of keyboards.**



■ **John Costello has his first cassette album released at UKE; he uses C-Lab Notator, a Kawai K1 synth and Akai S900 sampler.**

cassette albums available, with a new one due for release at the show; they use Steinberg's Pro-24 on their ST.

Mark Shreeve, who wrote Samantha Fox's biggest hit *Touch Me* and whose electronic music is used on Channel 4's American Football coverage, plays selections from his new LP *CrashHead*, written using C-Lab Notator, Akai MPC-60

sequencer and Fairlight.

UK Electronica 1989 takes place at the Logan Hall, Institute of Education, 20 Bedford Way, London WC1, on Saturday 23rd September.

Nearest tube is Russell Square, about a minute's walk away, on the Piccadilly Line, close to King's Cross and Euston BR stations. Doors open at 1pm and the show continues until approximately 10pm. Record and CD retailers, catering facilities and demos will entertain you in the breaks.

Tickets are £13.50 on the door, or £12 in advance from AMP Records, PO Box 387, London, N22 6SF. An SAE marked with the number of tickets required must be enclosed; make cheques or postal orders payable to AMP Records.

For more details you can phone AMP Records on 01-885 5665, 10am-6pm.

If you have any interest in computer music you can't afford to miss UK Electronica '89! ■

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VIRTUOSO PERFORMANCE

Launched at the BMF, Virtuoso is the only current UK-written pro-standard sequencer – so does it outdo the Germans?

In some ways, yes. The comparison sheet produced by Virtuoso's designers, Digital Muse, makes it clear that in terms of number of tracks, control facilities, resolution and cost, it's very competitive. But in many ways Virtuoso is completely different to rivals like Creator, Pro 24 and Master Tracks Pro.

■ Shows the music data in alpha-numeric form.

For a start, Virtuoso doesn't use GEM, which was abandoned at an early stage as being too slow and inefficient. Instead the whole program has been written from the bottom up in pure machine code (not C), so you'll find none of the familiar pull-down menus and GEM file menus.

Writing in machine-code allows the programmers to give Virtuoso a very high note resolution of up to 480 clocks per quarter note; but one wonders whether anyone could tell the difference between that and, say, Creator's 384 cpm. Virtuoso can also claim to be multi-tasking – you can load, save and edit while playing, for instance.

The main block display works a little like Creator; recording controls, locators and tempo controls are on the right, while blocks consisting of up to 99 named tracks are on the left. To move to other pages you click on buttons at the bottom of the screen.

The grid page gives you a smooth vertically-scrolling graphic display of the notes you have recorded, together with a moveable keyboard and options to insert, delete or alter notes. You can do the same on the event page, which displays the MIDI data in the form of a list.

The zone page allows you to process the quantization, timing and feel of chosen tracks, and the arrange section lets you chain-blocks into songs, as you do in Creator.

■ Here you can see music data in graphic form.

One of the handiest aspects of Virtuoso is the setup function, which lets you enter details of the names and MIDI channels of all your equipment, so the sequencer can handle data more efficiently.

The disk handling functions aren't brilliant; the display is too dissimilar to GEM, and although it doesn't say in this manual, you have to hit Esc before the program will recognise a new disk. Maybe that will be put right in the update. Let's hope so.

Good points include a text area where you can make extensive notes on all aspects of your recordings; on-line help functions giving information on every function; and a remarkably wide range of data filtering functions and MIDI controller editing.

One point to bear in mind is that Virtuoso, being a non-GEM program, will not allow you to use any GEM desktop accessories such as patch-passers at the same time. It also has no conventional music notation functions, so if you need those, look at Notator.

At £299, Virtuoso has every chance of putting up a good fight against the existing pro-standard packages; since it's MIDI file-compatible, you wouldn't lose all your old data if you moved to Virtuoso. Digital Muse will provide a demo disk for £5, refundable against purchase.

VIRTUOSO
£299 ■ Mono STs ■ Digital Muse ■ 44 Gloucester Ave, London NW1 8JD (01-586 3445)



■ Editing tasks which process notes in blocks occur here.



■ This shows the arrangement organised into a song.



■ All file handling operations take place here.

FORMAT RATINGS

Features 89%
 Very good specification, but planned expansion will make it better.

Speed 99%
 Written in machine code and GEM is bypassed, therefore very fast.

Ease of Use 80%
 Difficult to start with because of non-standard user interface.

Results 85%
 Highly competent for all levels of expertise.

Format Value 88%
 An attractive rival to established professional standard sequencers.

The Competition

Creator, £299, Sound Technology (0452-430001) Pro-24, £250, Eventide (099 389 8484), MasterTracks, £285 (£109 for Junior version), MCMXCIX (01 724 4104).

■ Virtuoso's main display, showing tracks and parameters.

Name	Inst	Start	Value	Parameter
1 Virtuoso 1	RJ D-10 Ch 1	ON	OFF	Quantize
2 Virtuoso 2	RJ D-10 Ch 2	ON	OFF	Prase No
3 Bottle Blow	RJ D-10 Ch 3	ON	OFF	Loop
4 Drum Kit	RJ D-10 Ch 4	ON	OFF	Loop
5 Reverse Cym	RJ D-10 Ch 5	ON	OFF	Loop
6 Telephone	RJ D-10 Ch 6	ON	OFF	Loop
7			OFF	Send
8			OFF	Send
9			OFF	Send
10 Check the 1	D-10 Drums	off	OFF	Send
11	Device 11	off	OFF	Send
12	Device 11	off	OFF	Send
13	Device 11	off	OFF	Send
14	Device 11	off	OFF	Send
15	Device 11	off	OFF	Send
16 Kick + Snare	RJ Device 10	ON	OFF	Send
17 Hi-Hats	RJ Device 10	ON	OFF	Send
18 Tom Fills	RJ Device 10	ON	OFF	Send
19 The Cym	RJ Device 10	ON	OFF	Send
20			OFF	Send
21			OFF	Send
22			OFF	Send
23			OFF	Send
24			OFF	Send
25			OFF	Send

■ You can set up your instrument's configuration.

FILTER #1	FILTER #2	FILTER #3	OUTPUT ASSIGNMENTS
NOTES	NOTES	NOTES	Start
POLY AT	POLY AT	POLY AT	CONTROLLERS #0-31
CHRN AT	CHRN AT	CHRN AT	CONTROLLERS #01 01 01 000
PROG CHANGE	PROG CHANGE	PROG CHANGE	SEC: 478 016
PITCH BEND	PITCH BEND	PITCH BEND	CONTROLLERS #02-03
MODULATION	MODULATION	MODULATION	CONTROLLERS #04-05
VOLUME	VOLUME	VOLUME	CONTROLLERS #06-07
SUSTAIN	SUSTAIN	SUSTAIN	CONTROLLERS #08-09
RODE	RODE	RODE	CONTROLLERS #10-11
OTHER CONTR	OTHER CONTR	OTHER CONTR	CONTROLLERS #12-17
SYSTEM EX	SYSTEM EX	SYSTEM EX	CONTROLLERS #18-19
			CONTROLLERS #20-21
			CONTROLLERS #22-23
			CONTROLLERS #24-25
			CONTROLLERS #26-27
			CONTROLLERS #28-29
			CONTROLLERS #30-31

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BU 5 - PRO BARTS by Marty Carr. This is a mouse controlled simulation. 501 down.

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USING SEQUENCERS

Continuing our look at sequencing principles using C-Lab Creator as our example, this month we'll go into different methods of recording sequences.

Each pattern consists of a number of tracks. A track can contain any sort of MIDI information; a single-line melody, a series of chords, patterns to drive a drum machine — whatever you want. But, unless you're using an algorithmic composer like M, the sequencer will only play back what you put in — so you should have a fair idea of how your piece is constructed before you start to record sequences, otherwise you'll make work for yourself.

There are two basic methods of recording from a keyboard — 'real time' and 'step time'. It helps to know which one is most suitable for different types of music.

In real time recording, the sequencer tries as far as possible to replay the music exactly as you played it — complete with all the correct pitches and timing. Of course, because it's a digital system, it actually corrects the timing of the notes played according to its internal clock. The resolution of this quantisation determines how realistically the sequencer replays your real-time recording. In the case of Creator, the maximum resolution is 796 parts per quarter

Part 2 of ST Format's regular tutorial

The screenshot shows the C-Lab Creator 2.1 software interface. At the top, it displays 'CREATOR 2.1 (c) 1989 Langeling'. Below this, there are several rows of data for track 1, including 'PROGRAM', 'CONTROL', 'PATCH', 'D.P. PITCHES', 'SUSSEX', and 'PSEUDO'. The piano roll shows notes with their durations and velocities. The interface also includes a keyboard display and various control buttons like 'CHORD', 'MIDI TO', 'INSIDE', 'STEP INP', and 'D.K.'.

note (PPQN) — which is high enough to appear completely realistic. If you want to pull your playing into stricter time, select a lower resolution on recording or playback — 96ths or 16ths. With a good sequencer you can always change the resolution later.

Alternatively, in step time the sequencer records the order in which you play the notes, but assigns exactly the same length to all of them, regardless of when you played them or how long you held down the key. The length is usually determined by the quantisation value you set.

Take a look at the graphic displays for these two Creator sequences. One is real time, and

the numeric and graphic displays show that the note lengths are different. The other is step time, so of course they're all the same.

This screenshot shows the C-Lab Creator 2.1 software interface in step time mode. The piano roll shows notes with uniform lengths. The interface includes the same top bar and control elements as the first screenshot, but the note durations are consistent across the sequence.

You would certainly want to use high-resolution real time recording for a lead solo. For a bass line you might like to try low resolution real time, for more precise timing; for drum patterns, low resolution real time or step time would be best. The first MIDI sequencers, like the Roland MSQ-700, had wonderful step time facilities; if you want to create extremely fast and complex runs of notes with metronomic precision, try step time on your software sequencer. The contrast of real time and step time sequences running together can produce some stunning effects.

Next month we'll look at the best ways to combine different Tracks into a Pattern, using multiple synths or multi-timbral expanders.

Last month we looked at how the notes of the musical scale relate to notes played on a keyboard. This month we'll consider how different lengths of note can be represented with different symbols.

First, an explanation about the notes in the centre of the keyboard (including Middle C) which don't appear on either the treble or bass stave.

These, and other notes which fall outside the range of the treble and bass staves, have to be written above or below the staves on

The diagram shows musical notation for notes outside the standard staff range. It includes labels for 'HALF NOTE REST', 'QUARTER NOTE REST', and 'EIGHTH NOTE REST' with corresponding musical symbols. The notes are shown on a staff with a treble clef, and the rests are shown below the staff.

MUSIC THEORY 2

More helpful notes on avoiding musical mayhem.

smaller ledger lines.

You just have to learn to identify their pitch.

While the position of the note on the stave tells us its pitch, the shape of the note gives us its duration. Obviously the actual length of the note in real time relates to the

The diagram shows musical notation for notes on a staff with ledger lines. It includes labels for 'F', 'G', 'A', 'B', 'C' and 'D', 'E', 'F', 'G', 'A', 'B', 'C'. The notes are shown on a staff with a treble clef, and the ledger lines are shown below the staff.

tempo and timing of the whole piece of music; but we talk about its length in relative beats.

What the Americans call a whole note, or what traditionalists would call a semibreve, lasts for four beats. A half note (minim) is two beats; a quarter note,

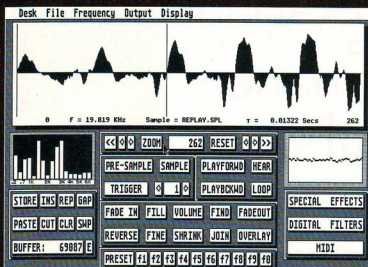
The diagram shows musical notation for notes on a staff with ledger lines. It includes labels for 'ONE BAR', 'HALF NOTE', 'EIGHTH NOTE', 'QUARTER NOTE', and 'HALF NOTE REST'. The notes are shown on a staff with a treble clef, and the ledger lines are shown below the staff.

(crotchet), one beat; an eighth note (quaver), half a beat. In some cases a dot appears after a note; this means that it's played for one-and-a-half times its normal length. In the same way that different symbols are used to represent different note lengths, different symbols represent different durations of rests, which can appear either between notes or in blank bars. The vertical lines on the stave are bar lines, marking the beginnings and ends of a bar.

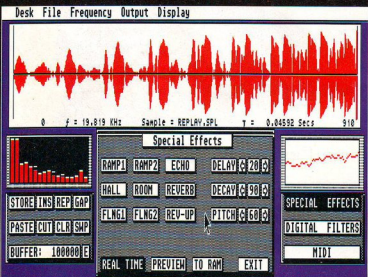
Next month we'll take a look at how ties and slurs can show expression in a piece of music, and consider time signatures and different chord types.

ANY SOUND YOU WANT

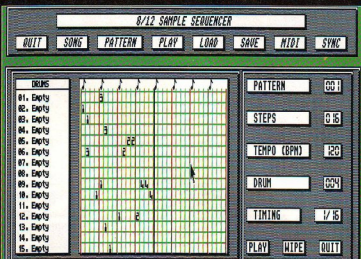
Unless you've got a large wallet, you'll have been restricted to 8-bit sound sampling. 2-Bit Systems has other ideas, as RICHARD MONTEIRO discovers.



The sampling software provided with 2-Bit's forthcoming range of sound samplers works in either high or medium resolution. The top graph shows what the sample looks like in memory at any level of magnification - right up to byte level - while the small graphs on the left and right of the display show frequency level and sample strength respectively.



A graph of the envelope wave can be viewed and edited just like the sample graph. Note the special effects window which allows real-time operations to be employed on incoming data or sampled sounds sitting in memory. Echo and reverb can add depth and presence to samples. Filtering is also possible; both high and low-pass filters are available.



A sample sequencer, written by Dave Woodhouse, is included with 2-Bit's sampling software. The drum sequencer lets you load in 15 individual samples and arrange them on a grid for replaying. Particularly nice is the fact that up to four samples can be played simultaneously. There's no need to bother with a drum machine any more as 2-Bit's software offers you more control and equally good sound quality.

Shhhfppppzz... Doubtless you'll have heard the annoying crackle, fizzle and hum that accompanies all but the best sound samples. There are several reasons for it - line noise, quality of the original recording and bad connections. Take away all these causes and you'll have a perfect sample, right? Wrong! You'll still get shhhfppppzzz...

Why? The current batch of sub £150 sound samplers for the ST all use similar technology to translate analogue sound to its digital equivalent. Very briefly, a signal in a recording medium like a record groove or magnetic field is termed an analogue sound because it varies in proportion to the original sound. It is very difficult to get a recorded signal to correspond exactly to the original sound as components can resonate, add harmonics and favour certain frequencies. Distortion occurs all too easily.

Digital recording (sampling) is an alternative method of storing sound waves. The process involves measuring the wave and accurately storing the measurements. Numbers can't decay - they don't grow or shrink on their own, so naturally the process is very accurate. Once a measurement has been made and recorded, the statistics are there for good. If you've listened to music on compact disc - and that

is sampled sound - you'll know just how exceptional the sound is. No buzz, hiss or static.

Of course, errors can creep in if measurements aren't taken correctly - for instance, if they are lost or not recorded in the first place. A sufficient number of readings or samples must be made to ensure a waveform is properly defined. Some clever chappie by the name of Nyquist worked out that the sampling rate (or speed of measurement) must be at least twice the highest frequency for the reconstructed sound to be authentic. In human terms this means at least twice the highest audible frequency. Compact disks have samples stored at 44.1kHz - enough to describe a wave of 20kHz (the highest a human can hear).

The higher the sampling rate, the better the representation of the sound. A 10kHz sample is dreadful compared to a 44.1kHz sample because only 5kHz of the audible range is recorded. The rest is lost. What you get is only a vague representation of the original sound - bits will be missing, whatever is present will be distorted and there'll be plenty of hiss.

However, sampling rate is only half the story. A sample is simply a number or measurement. Naturally, the larger the number of measurable levels the more accurate the sample. A ruler which measures in

millimetres is obviously more accurate than one calibrated only in centimetres. Across a metre, the centimetre ruler would only offer 100 measurable levels while the millimetre ruler would offer 1000. A sample is more accurate if the steps between each measurement are small and there are a lot of them over a given area of a sound wave.

Sounds stored on CD have 65,536 measurable levels. The number is significant because a maximum value of 65,535 can be stored in 16 bits (remember 0 counts as a level in binary). Hence, 16-bit sampling.

Going back to the sub £150 sampling technology available for the ST, you'll find that the samplers only offer sampling at 8-bit resolution, or 256-level recording. Not a lot when compared to the 65,536 levels on a CD. It is this rounding-off that causes much of the hiss prevalent in normal ST sound samples.

GENERATION X

Until now there has been nothing you could do about the situation – you either put up with hiss or lashed out an outrageous £2000 for a professional 16-bit sampler. Dave Woodhouse and Tony Racine of 2-Bit Systems have made it their business to bring in the next generation of sound samplers at realistic prices.

Three samplers are to be released by the 2-Bit lads over the next few months. All have working titles – 8/12, 12/14, 16/16. It doesn't take too much to figure out what the values refer to; the first is the sampling resolution while the second is the playback resolution.

2-Bit Systems developed the Replay 4 cartridge and software currently distributed by Microdeal and also Master Sound for the ill-fated Software Horizons. Unsurprisingly, 2-Bit knows all there is to know about sound sampling. Because users are always on the lookout for more powerful hardware, Tony and Dave decided to produce an enhanced version of the hugely successful Replay. The software for both 8/12 and 12/14 is very similar – in fact, cosmetically it is identical. The only differences are 12/14's enhanced sound tables.

If you've used Replay 4, you'll immediately be at home with the 8/12 and 12/14 software. All the menu bar options are identical with facilities for loading and saving samples and groups of samples; altering sampling/replay rate between 5kHz and 50kHz; selecting monitor or hi-fi output; chang-

ing the sample graph to either outlined, filled or scatter.

The most obvious difference between Replay and the new software is the inclusion of real-time frequency-strength and signal-strength graphs. The frequency graph performs a similar function to the display on a graphic equaliser. Very pretty, but not much use other than to tell you which frequencies are prevalent. The signal graph is crucial if you are to set the strength of incoming sound correctly.

General layout of sampling functions is much neater – even though there are a lot more of them. The buffering system which uses three pointers is very impressive. Along with two pointers which determine the start and end areas of the sample, there is a third floating pointer which is used as a marker to keep tag of previous edits.

Along with the expected features of a sampling package, the 8/12 and 12/14 software comes with extensive block operations. All the following can be performed on areas of a sample or the whole sample: reverse, fade-in/out, alter volume level, overlap, cut and paste. A very impressive facility enables you to search the main sample buffer for whatever is held in the cut-and-paste buffer.

DIGITISED DITTIES

New in the special effects department are a range of filtering options. Namely low-pass and high-pass filters. A low-pass filter does just that; it allows low frequencies to pass through unhindered while high frequencies are prevented from getting through. A high-pass filter does the opposite. The cut-off frequency can be determined by you.

The new software isn't complete yet, but hopefully this preview gives you some idea of what to expect. 8/12 is likely to cost around £130 while 12/14 should go for about £250. Microdeal will be distributing 8/12 (and probably call it Replay 4 Gold or something similar) while 12/14 and 16/16 will be handled by 2-Bit directly. 2-Bit will be at the PC show demonstrating the new hardware – don't miss it.

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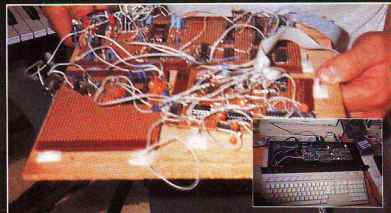
Paying £600 for a sound sampler might be considered extravagant – particularly when you're used to shelling out a little under £100 for a piece of hardware which is perfectly adequate.

What might be fine for home use probably isn't up to scratch for professional use. Take Replay 4, for instance: it's a damn good piece of

recording of the original sound.

With 2-Bit's forthcoming 16-bit sampler – and, yes, it will cost £600 – the grabbed sound will be virtually identical to the original. Sound digitised with 2-Bit 16/16 will be as good as anything you hear on compact disc. It's truly spectacular.

In addition to all the features offered by 8/12 and 12/14's soft-



■ Dave Woodhouse shows off a very early version of 16/16 – and, inset, a more up-to-date model.

ware, 16/16 will have sampling direct to hard disk, stereo sampling, extensive MIDI triggering, drum-machine software, and the most amazing effects generators you can imagine.

The reason for this harshness has been discussed earlier, but essentially it's down to the hardware's inability to make a perfect

ware, 16/16 will have sampling direct to hard disk, stereo sampling, extensive MIDI triggering, drum-machine software, and the most amazing effects generators you can imagine.

The nearest thing to 16/16 is something called the Lynx. It costs over £2000. You can now appreciate why professional musicians are getting so excited about 2-Bit's new baby.

BIT ON THE SIDE

Before setting up 2-Bit Systems with Dave Woodhouse, Tony Racine worked for British Aerospace on a Microdome Trainer for pilots. Tony's passion for toying with speech recognition systems led him to form 2-Bit.

In its comparatively short life, 2-Bit has produced the hugely successful Replay range for the ST and AMAS sampler for the Amiga. More recently 2-Bit has finished work on Master Sound, reviewed in issue 1 of ST Format. Unfortunately the company handling the sampler went bust; however, Kempston Data is now looking after the product. A limited number of Master Sounds are available at £34.95 – after that, price increases to £39.95. Details on 0234 841224.



■ Dave Woodhouse (left) is responsible for designing the circuitry inside 2-Bit's sound samplers and programming while Tony "Do you think this is my best side?" Racine looks after the sampling software side of things.



■ Inside 12/14. The hardware slots into the ST's cartridge port. Sound from a hi-fi or other sound source is sent to the digitiser's phono-in socket. An ADC (analogue-to-digital converter) transforms the sound into numbers; software looks after the rest. A phono-out on the digitiser lets you send grabbed data to an amplifier and speakers.

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This month sees the start of a new Desktop section – Beginner's Corner – where we'll look at all those little problems which beset new ST owners. MARK HIGHAM is the man with the answers.

MODULATORS

We've received a lot of queries about how to get hold of a modulator to convert the monitor output on an ST so that it can plug into the back of a standard television with an RF connector. This is essential for owners of the mega range of STs and some 1040s (which don't have an internal modulator). The London-based Silica Shop stocks a modulator box which plugs into the monitor port giving RF output. This nifty little box costs £59.95. Silica can be contacted on: 01-309 1111



■ With a modulator, the Megas can be connected to a TV.

HIDDEN FILES

B Watson of Lockerbie has a tip on how to create hidden files on a

S-S-SOUNDS LIKE STOS

Paul Doxford from Leicester has been busy using samples from Microdeal's *Replay* in his STOS programs. Below are two STOS listings: one will compress a *Replay* sample into half the memory that it normally uses; the other is used for decompressing the samples again.

In this way several samples can be stored on one disk, thus saving considerable space. Since the compressed samples can be played back in their compressed state, valuable processor time isn't wasted de-compacting the sample – samples taken at 20Hz can be played back at 10Hz. This inevitably results in a loss of sound quality but it will be more than adequate for most applications.

```
10 reserve as data 5, (SIZE) : Rem
   reserve bank for original sample.
   SIZE=size in bytes of sample
20 reserve as data 6, (SIZE) : Rem
   reserve bank for compressed
   sample:size=half above size
30 bload "SAMPLENAME",5 : Rem load sam-
   ple into bank 5
40 DESTADD=start(6)
42 BANKSTAR=start(5)
48 BANKLEN=start(5)+length(5)
50 for LOOP=BANKSTAR to BANKLEN step 2
60 BYTE=0
63 FIRSTBYTE=peek(LOOP)
68 SECONDBYTE=peek(LOOP)+1
70 FIRSTBYTE$=bin$(FIRSTBYTE,8)
75 SECONDBYTE$=bin$(SECONDBYTE,8)
80 HIBYTE$=mid$(FIRSTBYTE$,2,4)
85 LOBYTE$=mid$(SECONDBYTE$,2,4)
90 FINBYTE$=" "+HIBYTE$+LOBYTE$
95 BYTE=val(FINBYTE$)
100 poke DESTADD,BYTE
103 inc DESTADD
108 next LOOP
110 bsave "SAMPLENAME",start(6) to
```

```
start(6)+length(6) : rem save com-
   pressed sample
```

To decompress the sample:

```
10 reserve as data 7, (SIZE) : rem
   reserve bank for compressed sample.
   SIZE=size of sample in bytes
20 bload "SAMPLENAME",7 : rem Load com-
   pressed sample into bank 7
30 reserve as data 9, (SIZE) : rem
   reserve bank for decompressed sam-
   ple. SIZE=double above
40 DESTADD=start(9)
43 BANKSTAR=start(7)
48 BANKLEN=BANKSTAR+length(7)
50 for LOOP=BANKSTAR to BANKLEN
60 BYTE=peek(LOOP)
65 BYTE$=bin$(BYTE,8)
70 LO$=right$(BYTE$,4)
75 HI$=left$(BYTE$,5)
80 LO$=" "+LO$
83 LO$=LO$+"00000000"
88 HI$=HI$+"00000000"
90 LO$=left$(LO$,9)
95 HI$=left$(HI$,9)
100 FIRSTBYTE=val(LO$)
105 SECONDBYTE=val(HI$)
110 poke DESTADD,FIRSTBYTE
115 inc DESTADD
120 poke DESTADD,SECONDBYTE
125 inc DESTADD
130 next LOOP
140 bsave "SAMPLENAME",start(9) to
   start(9)+length(9) : rem save decom-
   pressed sample
```

The compressed sample will also suffer some loss of quality after decompression, but this is acceptable considering the savings in disk space.

DESKTOP

ANIMATION IN STOS

This month we're asking you to send in any hints and tips about using animation in STOS. We don't want long listings though - so keep them short.

We're going to start the ball rolling by posing a question sent in by J Tlaine from Sussex. He has a game with a character two sprites high. He wants to know whether he can create a sprite larger than 64 pixels high, without the character splitting at the join.

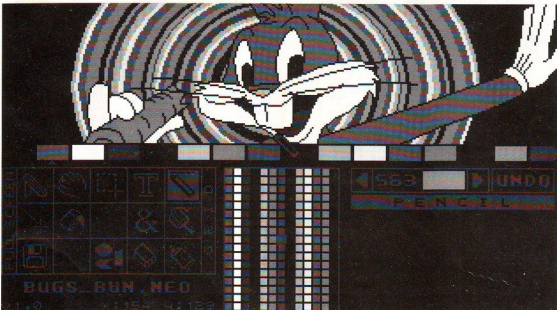
He also has another problem: he can make the character move when the joystick is used, but he can't animate it at the same time. It's important that

the character animates only when the sprite moves, and both the top and bottom sprite have to animate simultaneously.

If you have a solution to this problem or any other tips about STOS animation, mark them STOS ANIMATION TIP and send them to the usual Desktop address.



NEOCHROME - THE DEFINITIVE GUIDE



■ The basic Neochrome screen with the control panel shown at the bottom of the screen.

After last month's appeal for *Neochrome* hints and tips, we can now bring you some real goodies. Simon Jones from Herts, Christopher Hines from Staffs and Richard Lockwood from Doncaster were particularly helpful in compiling this list.

This month we managed to track down the *Neochrome* manual itself, which is located on a PD disk (South West software library; PD disk no.150). Everything except the animation routine is discussed. Next month we'll try and do the same with *Degas Elite*, so if you know any tips or wrinkles for this machine, drop us a line.

Unfortunately *Neochrome* will only run in low-resolution mode so all the colours at the bottom of the screen are the standard 16 ST colours (not actually shades of grey). The far left one is the background colour.

■ To change colours you need to move the pointer over the colour window along the bottom of the screen and drag the pointer using the right mouse button. If you want to use a certain colour then move the pointer over that colour and click with the left mouse-button. That colour will now appear in the colour area on the left of the screen. If you want to use it then double-click. Alternatively, you can alter the RGB levels directly at the base of the screen.

■ The grabber or hand icon can be used to scroll the screen up and down by holding down the left mouse button and moving it whilst it is over the picture. The cut and paint icon lets you cut bits out of the picture and move them around or erase them. After selecting the cut area (using standard rubber-band selection) you can cancel this by clicking outside the box or you can click on the cut icon which causes it to be put into a buffer. Copy will put the area into a buffer without clearing it from the screen whilst clear will erase the area altogether. Paste will

place the previously cut image onto the screen at the spot you select. Two icons at the right of the control panel will let you select whether to make an opaque copy or a transparent copy.

■ The T icon is used to place text onto the picture, with a control panel at the bottom right letting you select the type, size and font (the font is loaded from disk). Most of the other icons are standard drawing tools but the line icon should be noted because by holding down on the right mouse button you get lines in many different shades. Undo will restore the image if you make a mistake.

■ The load and save icon must be clicked on with the left mouse button for saving and the right button for loading. The nozzle of the spray can is changed by clicking on the relevant icon at the bottom of the control panel. Use the left mouse button for fast spraying and the right button for slow spraying. Clicking on the long rectangle to the left of the icon box will reveal the full screen whilst pressing Esc from here returns the control panel.

■ Simple animation can be produced using colour shifting - moving the notched pointers at either end of the colour bar using the right mouse button to choose the colours. The two arrows either side of the RGB levels control how the colours are moved. The left one makes them move to the left whilst the right one moves them right. Click instead with the right mouse button for continuous movement. Whilst moving, the left button speeds up the motion whilst the right one slows it down. To stop the movement, click on the opposite icon to that already selected.

■ To use your own brush pattern simply draw it and then cut it out as described above. To erase an entire screen, double click with the right mouse button on the rubber band icon, which will prompt a yes or no dialogue box - yes will clear the screen.

disk. Along with bad sector errors, this is one of the ways in which software houses protect their games from piracy.

```
move.w #902,-(a7)
pea filename
:put filename on stack
move.w #93c,-(a7)
:create number
trap #1
:do it
addq.l #8,a7
:tidy stack
tst do
:test for error
move do,handle
:used for file
clr -(a7)
:access
trap #1
filename dc.b "abc.doc"
handle ds.w 1
```

After the file has been created, a number is put into the handle which is used in `f_open` and `f_close` to write and close your file. This routine should only be used to hide resource or data files. If you hide a program file you'll never see it to open it!

PRINTING PROBLEMS

E Penfold from London wants to know if there is some way of using GFA BASIC as a simple typewriter program so that all text typed goes out to the printer. The required program is listed below:

```
DO
I=INP(2)
EXIT IF I=27
PRINT CHR$(I);
LPRINT CHR$(I);
```

LOOP
END

The program will display your input on the screen and print to the printer. Pressing the ESC key will exit this routine.

NEW PRINTERS

Richard Lockwood from Doncaster wants to know of any particularly good printers. It depends on how much you can afford and the quality you want. Check out Star for any dot matrix printer since the company has just announced a massive price drop on most of its (highly regarded) printers. For



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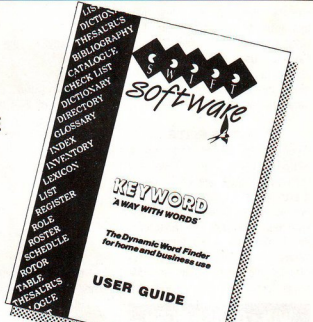
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company has just announced a massive price drop on most of its (highly regarded) printers. For example, the Star LC 24-10 has now dropped right down to £260. (Star can be contacted on 01-759 0005). Meanwhile, those of you who are after a laser printer quality should look out for our major review next month.

DISK COPYING

GFA BASIC can be configured to write the contents of one file into a new file. This new file may be held on another drive, thus permitting disk to disk copying.

```
Open "I",#1,"First_file"
Open "O",#2,"New_file"
Length%=Lof(#1)
While Length>32000
  Print
  #1,Input$(32000,#1)
  Sub Length%,32000
Wend
Print #2,Input$(Length%,#1)
Close #1
Close #2
```

First_file is the name of the original whilst New_file is the name of the new one. The program works by looking at the length of the original and if it is over 32000 characters long then the first 32000 are copied across to the new file. The length of the main one is decreased by 32000 characters until the remaining data is less than this amount - at which point it is written to the second file. Copying has to use 32000 character blocks because GFA cannot read more than this amount of data into one string.

FOR THE ELITE

When using Degas Elite on a 520ST, users are invariably restricted to just one work screen if extra fonts are loaded into memory, as James Dales from Merseyside has found out. The reason for this is that the AUTO folder contained on the Degas disk consists of instructions which load up additional fonts. The best way to go

WIN LOADSA DOSH

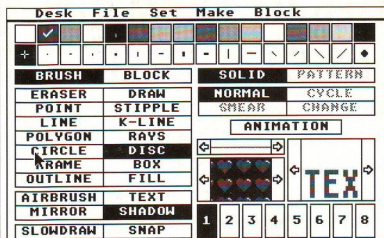
If you're having trouble with your ST, or if you have any hints or tips which you think other ST owners need to know about, send them immediately to: Desktop, ST Format, 4 Queen Street, Bath. BA1 1EJ. Each month we give away £30 for our favourite tip - so if you're looking for some extra dosh, get writing.

Paul Duxford from Leicester wins this month's prize for S-Sounds like STOS - his tip on compressing Replay samples for use in a STOS program.

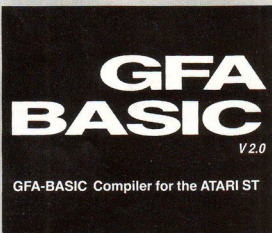
about getting access to two workscreens is to copy the entire contents of the Degas disk onto a second disk - excluding the AUTO folder and its contents. Now, when you reboot and double-click on the Degas program file there will be two available work screens.

There is no way to get more than this number without investing in extra memory.

► The Degas front screen. Additional work screens can be added by stopping extra fonts from being loaded.



BEGINNER'S CORNER



BACK TO BASICS

Okay, so what's wrong with the following GFA BASIC program written by Marcus Mansukhani?

```
10:
  if Inkey$="" then Goto 20
  goto 10
20:
  ? "hello world"
```

GFA's use of IF THEN statements is very different from the 8-bit days, where line numbers were necessary. IF THEN statements are split into several lines so that they can be used more efficiently.

The above statement should have been written like this:

```
10:
  if Inkey$=""
  Goto 20
  Endif
20:
  ? "Hello World"
```

But the whole routine could have been written better using loops instead of IF THEN statements.

```
Repeat
  Until Inkey$=""
Print "Hello World"
```

DOUBLE TROUBLE

The ST's double-sided drives are designed to be as simple to use as possible but if you're used to machines such as the BBC, which treat both sides of a disk as separate entities, they can seem a little confusing - especially to Daniel Spooner, from Hampshire.

First of all, although a double-sided drive can use both sides of a disk, as far as the user is concerned the disk has just the one side - albeit with twice the storage space. How does this work?

Well, the main directory on the disk contains a

few bytes which flag the start of each file, indicating which side of the disk the first block of the program is stored upon. Whenever you save onto a double-sided disk, your ST locates all the free space and saves the file into that space. You never need to worry which side of the disk a program is stored on because the ST takes care of everything.

With a single-sided internal drive and a double-sided external drive there are pieces of software which allow you to boot directly from drive B, which works okay for most applications. Unfortunately, this does not work with the majority of games software, which usually auto-boots directly from drive A - but since most games are on single-sided disks, this shouldn't cause any problems. A second drive is particularly useful for large games such as those produced by Cinemaware, which usually require excessive disk swapping.

A CLEAR VIEW

GFA BASIC doesn't allow you to clear the screen to different colours using a CLS 3 or similar command, so what do you do if you want the screen to clear to red instead of the white which usually appears when you execute a CLS. There are two ways:

The first is to re-define the fill colour to Defill 11,1 and then to draw a box which encompasses the entire screen - i.e. Pbox 0,0,399,199.

The second method is a lot more serious, since it involves changing the colour palette. However, the advantage is that instead of clearing just the main graphic screen you can alter the border colour as well, giving a completely red display. By executing the command Setcolor 0,7,0,0, everything displayed in white will switch to red. Now if you want to print anything in white you have to make another colour in the palette go white by changing the RGB levels using Setcolor x,7,7,7 where x is the colour number to be changed.

By executing the command: Setcolor 0,7,7,7 the red can be switched back to white.



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TELEPHONE LINES

Hand-held modems aren't the most useful thing in the world, but they do have their uses. For a start, they give you a more portable system and consequently are very handy for taking into work and linking to the office Mega for a quick comms session in your lunchbreak (whatever takes your fancy - Ed).

Wimbledon-based Dataflex Design is bringing out its latest addition to the comms scene in the shape of a re-amped version of its Pocket Stradacom portable modem. It's now been shoved into shockproof casing, presumably so that it doesn't explode when you drop it from a great height (not an unreasonable thing to do after trying to contact Micronet and finding some little twerp has found your password and changed it).

Low-power CMOS VLSI (very large scale integration) circuitry is behind the design and it's this which makes it so flexible. A tiny Lithium battery provides enough power for up to 30 hours.

Two baud rates are supported in this cigarette-boxed sized gem - 300 and 1200. The Hayes AT set is supported and MNP level 2 error-detection helps out when BT can't get its act together with line noise.

All this for £199. Contact Dataflex on 01-543 6417 for further details.

COMMS SOFTWARE

This month sees the start of a top ten on the best comms software. Send in your vote for both software manufacturer to the usual address. Include a few details about why you like the software.

Two prime contenders for the enviable number one slot, have to be FaSTcom from Atari and Microdeal's 220-ST (not an inspiring title). It depends on what you use your modem for as to which you want. FaSTcom lets you access viewtext systems such as Micronet although there's something decidedly fishy about its representation of flashing graphics. FaSTcom runs best in medium res, although high-res is supported without the colour graphics.

A dialog box lets you enter telephone numbers, names and baud rates of all the systems you intend to contact and these are stored on file. Choosing to contact a system invokes a scrollable window with the entire selection of

The BLACK BARON brings you this month's low-down on the comms scene with information on a new hand-held modem poised for release even as you read this.

systems previously entered. You can select either to telephone them or go into local mode (which lets you go on-line without dialling). Several modem protocols are supported including Hayes and Extended Hayes (which recognises the engaged tone).

The Viewdata or Text mode options are selected in the initial set-up for the system and these can only be adjusted again by logging off, changing the setting and then re-dialling. This is fine for most uses but is frustrating when you're having difficulty logging onto a system and want to see if it

might support the opposite mode.

A set of icons run along the bottom of the text mode display - these correspond to the function keys. None do anything particularly useful except the RECORD key and this will allow you to spool incoming data to a file. Xmodem up- and downloading support is provided. Both make disk accesses whilst on-line which means that there are long gaps in the operation. Consequently on-line time is increased but worst of all, if there are disk errors then you'll inevitably get a timeout from the host system. Not ideal.

SYSTEMS ARE GO

The comms scene is overflowing with one one board after another but how many support the ST? Listed here are the ST specific boards based in London. We'll look at those in other areas next month.

BB NAME	NUMBER	HOURS	RATE
Arkham Opus	01-952 5128	24hrs	V21/22/22b/23
Banat UK2	01-783 1151	24hrs	V21/22/22b/23
Body Matters	01-603 7581	24hrs	V21/22/22b/23
Byte Back!	01-959 8105	24hrs	V21/22/22b/23
Carshalton Atari	01-773 0408	24hrs	V21/22/22b/23
CIX	01-399 5252	24hrs	V21/22/22b/23
Club 1512	01-204 8755	24hrs	V21/22/22b/23
Connections	01-903 1309	24hrs	V23/23v
Crystal Tower	01-886 2813	24hrs	V21/22/22b/23
Dataseal/Wanderland	01-680 5330	24hrs	V23
Domain BBS	01-773 2422	24hrs	V22/22b
Falcon BBS	01-527 4165	24hrs	V21/22/22b/23
Gnome at Home	01-888 8894	24hrs	v23v
Hazzard BB	01-737 0505	8pm-7am	V21/22/22b/23
Jolly Roger	01-742 1640	24hrs	V21/22/22b/23
London Metropolis	01-519 1055	24hrs	V21/22/22b/23
MBBS Mitcham IIC	01-648 0018	24hrs	V21/23
Micromola	01-316 7402	24hrs	V21/22/22b/23
Organic Garde	01-464 3305	24hrs	V21/22/22b/23
Port of Call	01-391 5779	24hrs	V21/22/22b/23
Prometheus	01-300 7177	24hrs	V23v
Sirius	01-542 3772	24hrs	V21/22/22b/23
ST London BBS	01-443 2432	24hrs	V21/23
Starbase One	01-738 7225	24hrs	V21/22/22b/23
TBBS/Rovoreed	01-542 9767	24hrs	V21/22/22b/23
Twilight Zone	01-788 0884	24hrs	V21/22/22b/23
Village	01-464 2516	24hrs	V21/22/22b/23
Whitehall Penthouse	01-930 3903	24hrs	V21/22/22b/23

Viewdata support is FaSTcom's greatest asset. Clicking on the right mouse will switch into low-res. mode where you can see all the colourful graphics of a viewdata system. Clicking again goes back to medium-res. mode. The display is in mono with text effects replacing the colours, that is, colour blue could be displayed as italics.

FaSTcom's only real failing is its speed. It's slow to download

220-ST

A full featured, global terminal emulation program that combines the power of your Atari ST with the flexibility of a VT220 terminal.

■ The stimulatingly titled 220-ST from Michtron is a full-featured global terminal emulator for your ST.

data and GDOS fonts are employed which always create problems. However, for displaying viewtext it's one of the best around and with its support of split baud rates, contacting Micronet or certain homebrew bulletin systems is made extremely easy. Another useful feature is that data files can be called up and edited from within FaSTcom; it's easy to chop out corrupt data and avoid filling the disk with useless information.

Next month we'll look at Microdeal's comms offering which has overcome the problem of speed but has problems in other departments.

CALL UP

If you know of any bulletin boards with unusual interest sections or any intriguing areas on the commercial systems then drop us a line. Anyone who tracks down an eccentric or grossly offensive bulletin board will be sent a prize. Send your tips to

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For serious home users of the small business, we are pleased to announce a new package based around the 1040ST-FM. The 1040ST-FM has 1Mb RAM and a 1Mb built-in disk drive. In addition, the 1040ST-FM now comes with a TV modulator built-in. (The previously available 1040ST-FM was designed for use with a monitor only and did not come with a modulator.) This modulator allows the 1040ST-FM to be plugged directly into any connected TV set, and is completely self-contained and allows you to do so. The new 'Professional Pack' from Silica includes the new 1040ST-FM with modulator plus four high quality software packages including a spreadsheet, database, word processor and programming language. This 'Professional Pack' software will enable you to get straight down to business with your new computer. In addition to this software (worth £58.94), if you buy the Professional Pack from Silica Shop, you will also receive the Silica ST Starter Kit (worth over £200). Free Of Charge. Return the coupon for further information.



£499.95
INCLUDING VAT

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NORMAL RRP: £684.82		
LESS DISCOUNT: £385.82		
PROFESSIONAL PACK PRICE: £499.00		

With SM124 mono monitor: £598

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2Mb & 4Mb MEGA ST

The MEGA ST computers are styled as lightweight keyboard with a separate CPU, complete with a cooled telephone style case. There are two versions of the MEGA ST: one with 2Mb of RAM and the other with 4Mb. Each version has a 1Mb built-in disk drive built-in to the CPU unit. The MEGA STs do not come with a modulator built-in and must therefore be used with a monitor. With every MEGA ST purchased, we will add the Professional Software (worth £384.83) detailed above, plus the Silica 2Mb MEGA ST (worth £200) or 4Mb MEGA ST (worth over £200) both Free Of Charge. Return the coupon for further details.



DTP PageStream £149 +VAT =£171.35

Desktop Publishing (DTP) is one of the fastest growing applications for personal computers. We are pleased to announce a powerful low cost package for the Atari ST called PageStream. PageStream costs only £149 (VAT £171.35) and, because it works with an Atari 1040ST and a Silica 350-100M printer, you can be up and running with a complete system for less than £1000. Some of the features of PageStream are listed to the right. If you would like further information on this program, complete and return the coupon below, ticking the 'DTP' box on the corner.

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At prices correct at the time of going to press. £400

520ST-FM EXPLORER PACK

WITH BUILT-IN 1Mb DISK DRIVE



The value for money offered by the Atari ST range is reflected in the Explorer Pack featuring the 520ST-FM computer with 512K RAM. The 520ST-FM computer now comes with a built-in 1Mb double sided disk drive as well as a free mouse controller and a built-in TV modulator. The new 520ST-FM Explorer Pack includes the 520ST-FM computer, the arcade game Ranarama, a tutorial program and some useful desktop accessories. In addition, if you buy the Explorer Pack from Silica, we will give you the Silica ST Starter Kit worth over £200, FREE OF CHARGE. Return the coupon for details of our Starter Kit and of the full ST range.

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WHY SILICA SHOP?

Before you decide when to buy your new Atari ST computer, we suggest you consider very carefully WHERE you buy it. There are MANY companies who can offer you a computer, a few peripherals and the top ten selling titles. There are FEWER companies who can offer a wide range of products for your computer and expert advice and help when you need it. There is ONLY one company who can provide the largest range of Atari ST related products in the UK, a full time Atari ST specialist technical helpline and in-depth after sales support including free newsletters and brochures delivered to your door for as long as you require after you purchase your computer. That one company is Silica Shop. We have been established in the home computer field for ten years with an annual turnover in excess of £5 million and can now claim to meet our customers requirements with an ability and understanding which is second to none. But don't just take our word for it. Complete and return the coupon below for our latest literature and begin to experience the Silica Shop specialist Atari service.

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ST Format's new Letters Editor ROD LAWTON delves into another bulging postbag. Got something to say? Write to ST Format Letters, 4 Queen Street, Bath BA1 1EJ

A LOAD OF BLOCKS

From the "Great Minds Think Alike" department (or is it fools seldom differ?) I would like to offer my hearty congratulations to F. Driver and G. Wills. It is gratifying to know that there are fellow pentominoe enthusiasts abroad in the land.

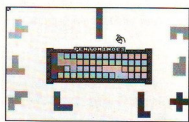
If anyone cares to obtain a copy of the outrageously expensive American START magazine, August '89 edition, they will notice a strikingly similar game called *Stumbling Blocks*, penned by yours truly. Hence my interest in the subject.

I think it only proper that due credit is given to the true creator of this fine puzzle, the great mathematician Solomon W. Golomb. He created an entire branch of recreational mathematics he called Polyominoes, which he first brought to the world in 1954, in his book simply entitled *Polyominoes*.

The sub-set of five sided figures is the basis of Pentominoes, upon which both Messrs Driver and Wills and myself based our games. I, unfortunately, had the temerity to rename it slightly.

I am puzzled by the reference, in the README file to the game being ancient. Admittedly I wasn't actually born in 1954, but I wouldn't go so far as to say that it was ancient, would you?

Finally, I would like to say that although I enjoyed Pentominoes, I



■ **Advanced Pentominoe theory. Very interesting - really.**

still think *Stumbling Blocks* is better. But then I would, wouldn't I.

**Mark Annetts,
Richmond, Surrey**

...zzzzz...what? Oh yes, I couldn't agree more

HIGH PRIASE

I am writing to express my opinion upon your new magazine, *ST Format*. Firstly let me say I rate it very highly indeed, and it's quality is second to none. I wish it every success.

I was extremely sad to see the old *ST Amiga Format* split into two. I understand separate magazines will provide more space for each machine in both magazine and disk, but it is still a pity to see the demise of a publication which showed how much the two computers had in common, as opposed to highlighting their individual differences.

Now that you are irrevocably divided into two, do not let your-

selves sink down to the standards of lesser magazines by becoming a battleground for conceited ST/Amiga owners. I already noticed various writers (including your own journalists) having a pick at the Amiga in Issue One. Do try and stop it. Sarcasm is the lowest form of wit and only gets up people's noses. Keep focussed on the ST if you are to be an ST-only mag.

**Marc Morris,
Larkfield, Maidstone**

OK, no more digs at the Amiga. Honest. (It needs all the help it can get ... oops!)

GHOST IN THE MACHINE

I own a 1040STFM and have recently been having problems with my mouse. When I open a folder my mouse acts strangely. The cursor on the screen is moving perfectly one second but after the folder has been opened the cursor goes up when I move the mouse in a downwards direction and vice versa, but the left and right directions are perfectly fine.

This cursor movement carries on into a utility when it's double-clicked from the desktop. The only way I have found of curing the problem is to rest the computer which can be very annoying.

**Mark Rigby,
King's Lynn, Norfolk**

RUDE RESPONSE

You are "mildly surprised" by the lack of female correspondence on the issue of pornography in last month's magazine. Perhaps the following points give some explanation for this:

- 1 I read my boyfriend's copy - I would not have bought this, or any other publication, with the sexual connotations and imagery displayed on your front cover.
- 2 I, probably along with hundreds of other women, find publications displaying this type of material to be highly unintelligent, of interest only to those whose brains reside in their scrotums. There is, therefore, very little point in embarking on a serious discussion on the subject of pornography with the type of readership being attracted to such publications.

- 3 If you had seriously considered the effect and implications of pornography, rather than just using it as what you probably thought was a novel way to increase sales, you would understand that the "page three" material to which you refer is no less offen-

sive to many women and men than the "illegal" material found on your cutting room floor.

Why is it beyond you to take a positive stance against pornography? Who is it that you are afraid of offending? Certainly not those who are offended both by pornography itself and by the flippant a juvenile way in which it was discussed by your writers.

Why not change the basis, the starting point of the debate? Why not publish a magazine free from pornographic imagery, and wait for the letters to arrive complaining at its absence, rather than the other way round? It would be interesting to see what the response would be.

**Stella Henderson,
Bradford, West Riding**

Thanks for the intelligent and considered response, Stella. Whatever you might think of the original article, if it at least made people think, then I would say it was a lot more useful than a few thousand words of tedious soapboxing that no-one would have read.

ST FORMAT LETTERS

Oh dear, it sounds like you've contracted the "Ghost" virus. This little devil is relatively harmless as viruses go, but unless you're in the habit of powering off between disks the chances are your whole collection is infected by now. What you need is one of the many commercially available virus killers (you'll find one on the ST Format issue 1 cover disk). One warning though - don't use a virus killer on an autobooting disk, e.g. most games disks. Virus killers re-write a disk's boot sector, so your game will no longer load. Good luck!

DISK-EARNING READER

On your cover disk why don't you have some full price games or adventures? You could have one game on side A and other things on side B. Then it will be the best magazine in the world. You could put more music on the disk and also some digital pictures of all ST Format staff so we can see what you look like. I know it sounds strange but we could look at them and say they are the people who made this the best magazine in the world. And in issue ten my disk did not work so I sent it back four months ago and have never got it back - so what happened to it?

**Sean McCutcheon,
Birmingham**

We like to cater for all tastes on the cover disk - that's why we include such a range of games demos and utilities. And if you like a game demo, well you can always go out and buy the game! Your replacement issue 10 cover disk is presumably decaying quietly in a GPO sorting office in the Outer Hebrides somewhere, so we're sending you another one. As for putting digitised pictures of the ST Format team on the cover disk - I really don't think so. Just trust me on this one.

CHEEKY CHAPPIE

Last week I purchased a copy of ST Format which included a Format cover disk.

Bloodwych seemed to load correctly but the mouse arrow floated uncontrolled across the screen which made it very difficult to select a warrior. However, I finally managed to select one, only to find that I could progress no further in the game. It just would not do anything else! (i.e. I couldn't select warrior 2) I then decided to try GFA BASIC - more problems. It loaded - but I could not move the mouse arrow more than half way across the screen. Which meant I could not select some items on the screen menu.

CONSOLE CRAZY

I currently own an Atari ST which is fine for my workprocessing (you can get spellcheckers too) and music making, but I feel I need to expand more on my games playing and I therefore wish to buy a console, PC Engine or Sega Megadrive. I hear both are very new and are fast machines in terms of speed of scrolling and animation. I have a budget of £200 to spend and cannot decide which one to choose, so as you have obviously play tested them could you tell me which is the best and which one has more value for money and future prospects?

**P C Smith,
Gloucester**

Well, the PC Engine is out now, but very hard to get hold of, while the Sega Megadrive looks like it won't be available until some time in 1990. The Sega is assured of being readily available and massive software support. However, we reckon you'd be a mug to try either before you've seen the new Atari STE. See page 14 for details...

As I have a single-sided drive this was all I got out of your wonderful disk. It's not good enough - £2.95 is a lot of money to pay for rubbish. Also I think that asking me to pay £1.75 for the B side is absolute cheek!

In conclusion, I will only say that I had not purchased your publication before and I probably will not again.

**P D Daveridge,
Exmouth, Devon**

We included a two-player version of Bloodwych on the cover disk, but it can be played by one player. (The wandering mouse pointer is caused by leaving the mouse plugged in while you're trying to select a warrior) Simply plug the joystick into port 1 to select warrior 1, then plug it into port 2 for warrior 2. The game can then be

played using either warrior - the other warrior stays where he is. There is nothing wrong with GFA BASIC on the cover disk - it's just that it works in medium-res but doesn't tell GEM to switch from low-res (the default desktop mode). Simply select medium resolution from the desktop before loading up GFA.

THERE'S ALWAYS ONE

I like your magazine and the fact that you have articles about some things that are not only about STs. I was going to say that it was a pity that the article 'Ghosts in the Machine' (issue 1) did not mention the computer communication described in 'The Vertical Plane' by Ken Webster (Grafton Books). However, I am pleased to have the opportunity to tell your readers about it.

A VERY NICE MAN

The ST/Amiga Format split was a good idea. But please could you make your articles on programming (e.g. GFA BASIC) more substantial than the skimpy effort on 68000 in ST/Amiga Format. Incidentally, well done for getting GFA BASIC V2 on the cover disk - even though I've just bought V3.0.

Secondly it was nice to see a calm, well-reasoned reply to some contentious statements, rather than the snide or emotional ones you often get. I refer to Mr Wayne J. Smithson's letter in ST Format 1, replying to Brian Watson's rather less informed statements in ST/Amiga Format. I rarely buy games, but I may well get Blood Money, because besides being (by all accounts) a jolly good blast, I now know it was written by a programmer more concerned with the quality of his work on any machine, than making excuses for poor work. This, I believe, deserves support.

Finally, two words of praise. Firstly to Evesham Micros, who sold me my ST a few months ago, not only for having the cheapest 1040 ST in the market, but also for their speedy help when the printer port developed a recessed pin. Secondly to the guy manning the phone between 10am and 11am on the 26/7/89 at GFA Data Media UK. I wish I'd got his name so that he could get a deserved pat on the back from his boss, because his pleasant and helpful attitude was such a change from the indifferent (or worse!) attitudes of some companies I have phoned. I just thought I'd say this lot, because it isn't often that people are praised for their efforts.

**P Fyleman,
Chelmsford, Essex**

'The Vertical Plane' is the most extraordinary story I have come across and it is true. It is about the author and a small group of his friends who found that his house in Dodleston, near Chester, had some minor poltergeist activity. When he brought home a BBC Micro in December 1984 to do some word processing, he started to find bizarre messages left on it. The majority of the messages came from a farmer and ex-Oxford scholar called Lukas Wannman who lived on the site of the same cottage (not the same building) in 1546.

Ken's girlfriend, Debbie, was the 'sensitive' and had to be there for the messages to come. She was also able to visit Lukas in her 'dreams' when she became a ghost...

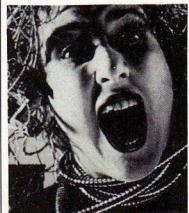
I could describe books about other communications with the dead and on true UFO abductions but it would be better to say that if anyone is interested in any of this they can get in touch with me via ST Format. We are definitely living in a remarkable time and those people who have spoken to the 'etheral beings' have been told that we had better sort out our planet pretty soon or we shall have a very difficult time going through the crisis that awaits us in the near future. Crop circles are also to do with this.

I know it all sounds nutty and impossible but the truth will not go away just because you do not believe in it.

**John Harman,
Basingstoke, Hampshire**

PS This was written and printed on a Mega ST with Protexit, an Atari Laser and the Epson emulator with 'Rockface' typeface which does not come with the emulator but...

Oh boy! I wonder if those 'etheral beings' wear white coats? By the way, anyone wanting to enter into correspondence with Mr Harman can not get in touch with him via ST Format - try a medium instead.



■ Is your machine haunted by 'etheral beings'? Don't call us...

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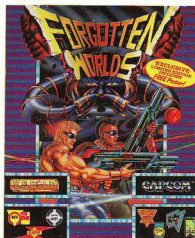
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ST Amiga Format Issue 9



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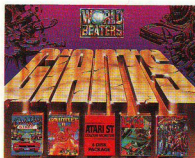
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BACK ISSUES

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If you're a new reader to the "Format" titles, we feel sure that you'll be anxious to catch up on some of the very rare earlier issues of ST Amiga Format magazine, each with its own cover disc but also full to the brim of great reviews, articles and news. Remember, there are limited stocks!

Issue 1 ■ Order Code AM201
Cover Disk: Amiga: interceptor demo, Virus Killer, Othello game.
ST: Oids demo, Virus Killer.
Magazine: Wordprocessors evaluated, Graphics packages compared, Pro-sound, Superbase benchmarked.

Issues 2-6 ■ SOLD OUT! SORRY!

Issue 7 ■ Order Code AM207
Cover Disk: Amiga: Cosmoroids, play the game, MCAD design for your Amiga.
ST: Play Level One of Flying Shark, HiSTart, high quality ST art.
Magazine: In review of Flair Paint, Colour Printers, Shoot 'em up Construction Kit, Learn BASIC.

Issue 8 ■ Order Code AM208
Cover Disk: Amiga: Stunning scenery generator, Purple Saturn Day demo.
ST: Purple Saturn Day demo, Database construction set.
Magazine: Autoroute (the computer journey planner), Sculpt 4D, a modelling package, Protext (THE word processor for your Amiga then), Cameron's Handy Scanner reviewed.

Issue 10 ■ Order Code AM210
Cover Disk: Amiga: Cybernoid II (playable demo), Learn Devpac 1.
ST: Zak McKracken (playable demo), Learn Devpac 1.
Magazine: Upgrade your machine with extra magabytes, Daatascan hand-held scanner from Kempston Samplers.

Issue 11 ■ Order Code AM211
Cover Disk: Amiga: Blood Money (playable demo), File requester, add requesters to programs.
ST: Archipelagos, playable demo, Fastmouse, speed up mouse operation.
Magazine: Make yourself a sound sampler, Deluxe Paint III, Animation tutorial, Why not invest in a better screen? Here's the choice...

Issue 12 ■ Order Code AM212
Cover Disk: Amiga: Colossus Chess, playable demo, VirusX V3.1 protect your disks against viral infection, Boot intro, add scrolling messages to your disks.
ST: Flair Paint, usable demo of this brilliant art package.
Magazine: Video digitising, Attach a MIDI system to your machine and make music, The best available joysticks.

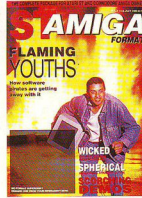
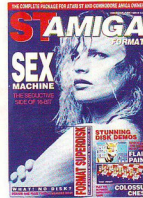
Issue 13 ■ Order Code AM213
Cover Disk: Amiga: Wicked, playable demo of this totally addictive game, Mandelshow, create infinitely complex pictures with this Mandelbrot generator.
ST: Spherical, an excellent playable

demo of this strategy game.
Magazine: Pagestream, a brilliant DTP, Animation techniques, the reasons why, The choice of hard drives.

ST FORMAT

Issue 1 ■ Order Code STF01
Cover Disk: Bloodwych and the fabulous GFS BASIC 2, the full working version.
Magazine: Mastersound, a new sound sampler reviewed, Hisoft C Interpreter, Atari, the past, present and future. Have machines a will of their own? Are there ghosts in your ST?

Issue 2 ■ Order Code STF02
Cover Disk: Blood Money from Psygnon-Atari, the past, present and future. Have machines a will of their own? Are there ghosts in your ST?
Magazine: The life of a joystick, from drawing board to plastic. Continuation of the GFA Basic tutorial. That's Fun Face and its big sister!



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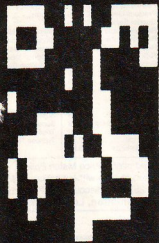
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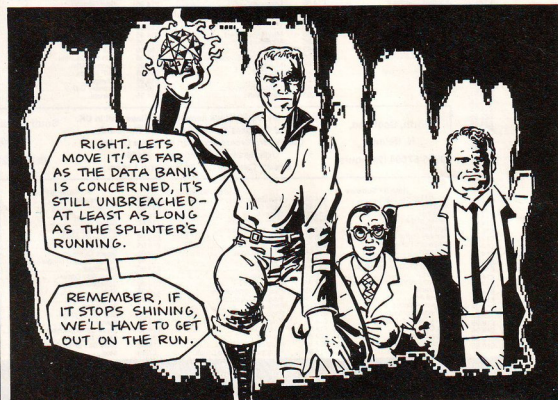


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EXITED THE BLACK
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LAX THE PARAMETERS
ARE IN THIS REGION."

"BUT THE THREE OF THEM
WERE EASILY TRACKED
TO PARA-SPACE
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"CARROLL STILL DOES
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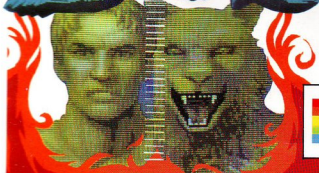
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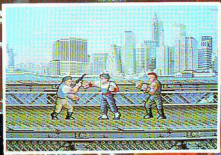
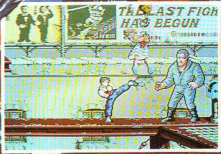
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