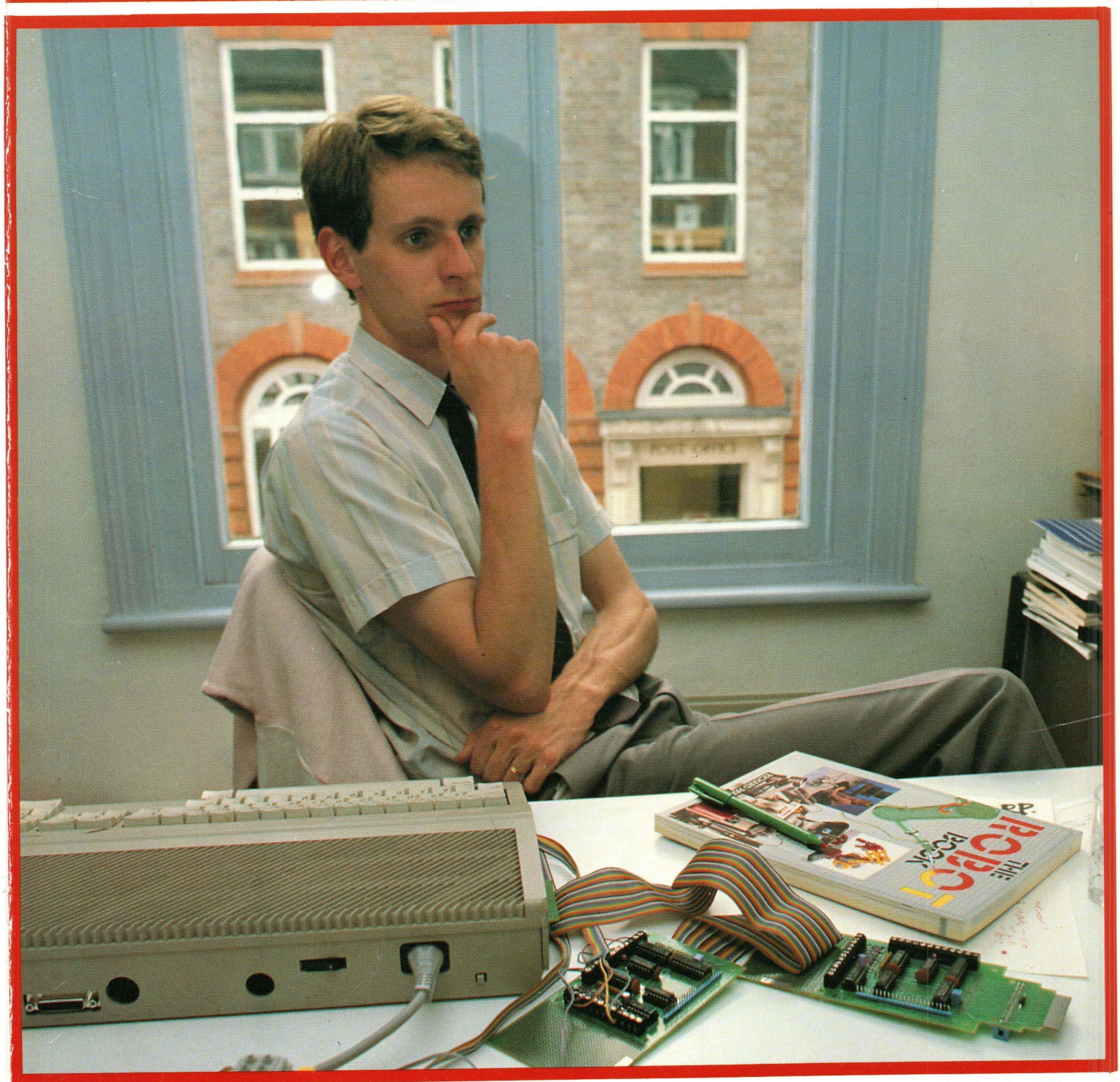
October 1988
Issue 32

ST World

THE ESSENTIAL PERIPHERAL FOR YOUR ATARI ST



Personal Robots, Richard Pawson talks about the future of Robotics.

- **PC Show Report** - *Exclusive PC Show report just days after the event!*
- **Augur OCR** - *Fast and powerful Optical Character Recognition*
- **Hardware** - *SupraModem 2400, SupraDrive FD10, Okimate - 20*

CYBER SERIES

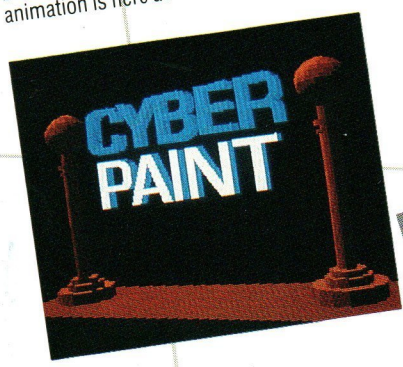
CYBER PAINT

CYBER PAINT is a powerful animation and paint program. Use it by itself to create colourful 2D animations, or add the final touch to your three-dimensional Cyber Studio animated sequences.

Choose from a host of flexible paint box techniques to retouch individual Cyber Studio frames. Cyber Paint lets you overlay one image with another, so you can even add imported Degas or Neochrome backdrops.

Animation isn't limited to simple cartoon-style movements, either. Cyber Paint has a range of special effects to resize, distort, move, and superimpose entire screens, so you can produce sophisticated video effects just like the ones on television — and the only studio you need is your ST.

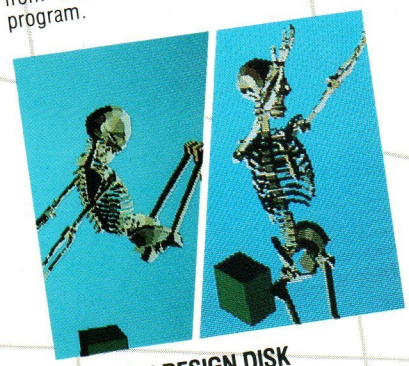
Whether you use Cyber Paint on its own or with other Cyber products, you'll be amazed at the results. Professional animation is here at last!



CYBER CONTROL

CYBER CONTROL is an easy to use, BASIC-like programming language specially designed to work with Cyber Studio. It enhances CAD-3D 2.0 with a host of new features. There are two new cameras, free to move around or through your 3D creations. Movable, multi-layered Cyber Paint blocks for colourful cel animations. And the power to create complex curved objects, using spline generation techniques. Together they let you animate complex objects you never thought possible — like a skeleton doing backflips!

Cyber Control is an independent desk accessory, so it's always ready for use from CAD-3D 2.0, or any other GEM program.



NEW! CARTOON DESIGN DISK

A collection of 3D comic characters, plus special Cyber Control programs to move them. You decide which way their heads turn, where their eyes look, how fast they move — or fly — and Cyber Control brings them to life automatically.

NEW! CYBER SCULPT

Want to create your own 3-dimensional designs? Need more sophisticated modelling techniques? Then CYBER SCULPT is for you! A mouse-driven, stand-alone program that does just one thing: build 3D objects. And not just spun or extruded — but twisted, pushed, pulled, tweaked and pummelled! The most fantastic shapes imaginable.

Working with Cyber Sculpt is just like working with clay. Your object's not quite the right shape? Then mould it into a new shape! Grab some vertices and move them into a better position. Or use a "magnet" to stretch them.

Cyber Sculpt has cross-sectional modelling, for easy creation of complex shapes like boat hulls, and for engineers, there's support for digitizing tablets.

NEW! VIDEO TITLING DESIGN DISK

Add that professional touch to your home videos with spectacular animated titles. Includes 3D font and objects specially designed for titling effects. Plus custom Cyber Control programs to animate them, create credit sequences, etc. All you need to challenge Hollywood!

HUMAN DESIGN DISK

An accessory disk packed with humanoid forms and figures to add life to your CAD-3D scenes. Includes complete male and female skeletal prototypes, plus detailed heads, hands, etc. Take a tour of the human skeleton!

FUTURE DESIGN DISK

Turn your ST into a space engineering factory with this library of futuristic objects. Everything from androids, rocket engines, and command pods, to complete spacecraft.

ARCHITECTURAL DESIGN DISK

An electronic architect's studio packed with doors, windows, stairways — all you need to build your own CAD-3D dream house.

STEREOTEK

Want to get right in with the action on your Cyber screen? Well, now you can! The amazing STEREOTEK glasses give you a startling insight to your creations, with a true stereoscopic view. Includes cartridge interface unit, stereo desk accessory, animation and slide show, complete developer's instructions, and source code.

G.I.S.T.

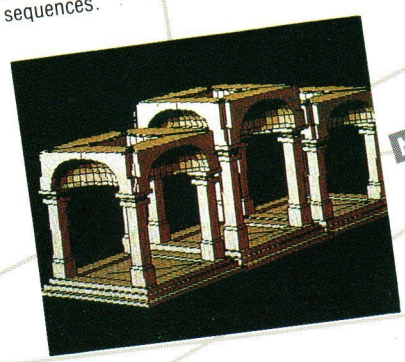
G.I.S.T. is a powerful GEM-based sound laboratory for use in designing, editing, and playing sound effects. Used as part of the Cyber series, it allows you to incorporate sound effects into your Cyber Studio and Cyber Control animations.

CYBER STUDIO

CYBER STUDIO combines STEREO CAD-3D 2.0, a three-dimensional design program, with CYBERMATE, a powerful animation control language. Together they transform your Atari ST and turn your ideas into realistic 3D moving images.

STEREO CAD-3D 2.0 allows you to create your own 3D objects and scenes — quickly and easily! Use the built-in 3D primitives to shape your ideas, then add more detail with CAD-3D 2.0's tools, combining several objects to build up more complex shapes. Add the final touch with subtle lighting effects and that's it — from starting point to starship in a matter of minutes!

CYBERMATE is an animation control language designed specifically for use with CAD-3D 2.0. Cybermate's interpreter allows you to combine standard Forth commands with specialised display control statements, to build up smooth, fast animation sequences.



3D DEVELOPER'S DISK

The 3D DEVELOPER'S DISK opens up a "pipeline" into Cyber Studio, allowing you to create your own 3D applications, without the need for specialised 3D mathematic knowledge.

3D PLOTTER & PRINTER DRIVERS

A library of drivers for use with Cyber Studio, supporting Hewlett-Packard pen plotters (and compatibles), plus Gemini, Star, Epson, Okidata, NEC, Panasonic and C Itoh matrix printers.

NEW! 3D FONTS I & II

Two packs of spectacular 3D fonts in a variety of styles and effects. Use them in your Cyber animations or design your own 3D greeting cards, logos, or letterheads. Plus, added bonuses: Tom Hudson's SUPER EXTRUDER TOOL, used to create these fonts, in pack 1; and multicoloured 3D clip art in pack 2.

CYBER SERIES

	● CYBER STUDIO	£79.95
	● CYBER PAINT	£69.95
	● CYBER CONTROL	£59.95
NEW!	● CYBER SCULPT	T.B.A.
NEW!	● CARTOON DESIGN DISK	£29.95
	● HUMAN DESIGN DISK	£29.95
	● FUTURE DESIGN DISK	£24.95
	● ARCHITECTURAL DESIGN DISK	£29.95
NEW!	● VIDEO TITLING DESIGN DISK	£29.95
	● 3D DEVELOPER'S DISK	£29.95
	● 3D PLOTTER & PRINTER DRIVERS	£24.95
	● 3D FONTS I	£29.95
NEW!	● 3D FONTS II	£29.95
	● STEREOTEK	£149.95
	● G.I.S.T.	£34.95

Antic

From Antic Publishing Inc. An Information Technology Company

THE CYBER SERIES

The Cyber Series from Antic Publishing Inc. is a family of programs which turn fantasy into reality on your ST's screen. Watch your own three-dimensional universe come to life right before your eyes, with everything from skyscrapers to spacecraft. Fill your imaginary worlds with realistic walking figures. Add subtle colours and sound effects. You can even produce the same kind of sophisticated special video effects as a television studio.

Cyber packages are more than just fun to use — there's a serious side too. Use them in the office or studio to visualise your ideas at pre-design stage, saving time and money by getting things right first time. And since you're working in 3D, you can see above, below, even inside your designs, just as if they were sitting on the desk in front of you.

Start with Cyber Studio, mainstay of the Cyber Series, then add other Cyber products, each with their own exciting features, to build a powerful library of programs capable of breathing even more life into your Cyber creations. Everything from sound effects to a specialised animation control language. It's just what your ST's been waiting for!

ELECTRIC DISTRIBUTION,
8 GREEN STREET, WILLINGHAM, CAMBRIDGE, CB4 5JA
Tel: (0954) 61258. Fax: (0954)61345 . Telex: 817057 GSTUK G.

Please send me more details of the Cyber series. STW1088

NAME _____ MACHINE _____

ADDRESS _____

POSTCODE _____

Desk File View Options

NEWS | REVIEWS | PROGRAMMING | FEATURES

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10 **Okimate-20** A low-cost colour printer available at the bargain price of £149

12 **SupraModem 2400** This neat little modem from Frontier Software packs a tempting specification into its trim dimensions.

13 **Flexidump** An impressive utility for any Epson compatible printer; label maker, picture dumper and poster-maker.

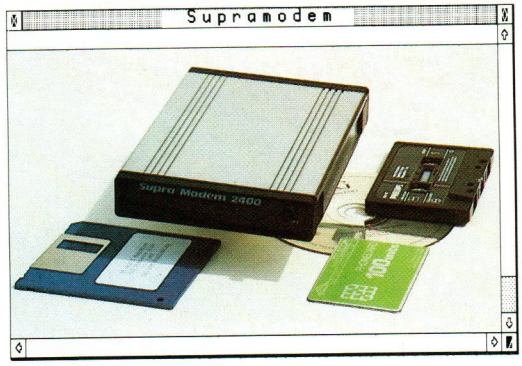
14 **PC Show report** There's been plenty for ST owners to see at this years major event - the 1988 PC Show.

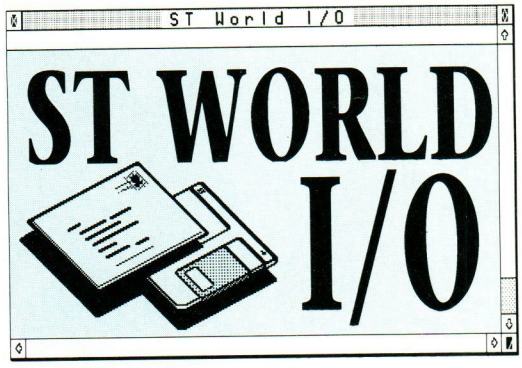
17 **Atari '88, Dusseldorf** It's show time in Germany too, but things are slightly more serious over there.

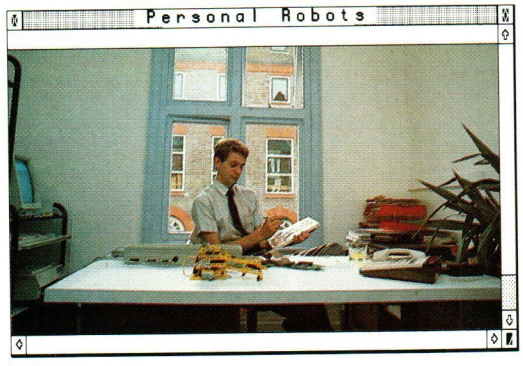
21 **ST World I/O** More help, ideas, and opinions from ST World readers in our popular information exchange. This month: Sign Language, GDOS Fonts, TOS irregularities, unusual uses for printers, CD-ROM, disk drive problems, and more.

30 **Personal Robots** A profile of the Company that brings you the Atari Robokit, not to mention personal and domestic robots for the 21st century.

38 **STAD** This curious bit-map oriented drawing, painting and design program is crammed full of clever features, John Nuttall is impressed.







SUPERTESTS INTERVIEWS

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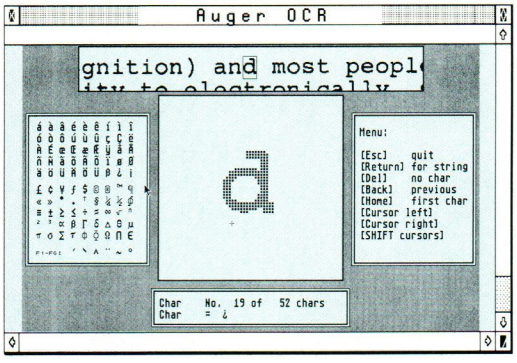

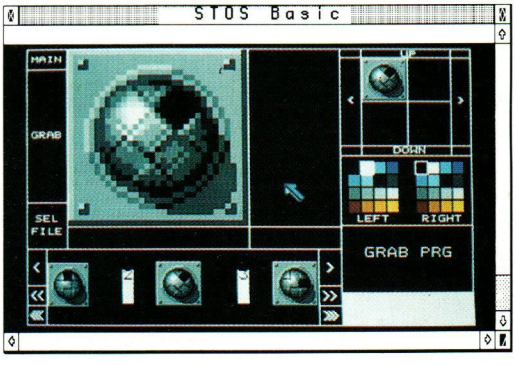

Supra FD10 Ten megabytes from a single 5.25 inch floppy disk, Frontier Software offer unlimited mass storage for the ST. Ian Tindale investigates the possibilities this device has to offer. 46

Logistix Update Roland Tongue reports on the latest upgraded version of what is probably the top ST 50

Programmer's Clinic C is the dominant language featured in this month's session at the clinic. Structures, random numbers, window updates, and a great deal more including a few snippets of Assembler 52

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ST World at Large The City and Hackney Association for Mental Health. Martin Walsh Visits the CHAMH to discuss the work they put ST systems to . 78

GFA Artist Yet another paint package, this time it's a 512-colour system, with animation as standard. 82

STOS Basic Mark Annetts previews Mandarin's comprehensive Games creation language, and concludes that even he would use it. 88

NEWS

The new frontier

Frontier Software, sole UK supplier of the Supra range of hard disk drives for the Atari ST range of computers (see their FD-10 10MB floppy drive reviewed in this issue) announce the availability of a new SupraDrive - a 120MB version.

Since their release in the UK in February 1987, the 20MB, 30MB, 60MB and 198MB SupraDrive hard disks have proved to be the most successful hard disks for the Atari ST computers next to Atari's own. The new 120MB version, priced at £1699.95 including VAT, rounds off the range and gives the user a middle ground between the 60MB and 195MB drives.

Martin Walsh, Frontier's Marketing Manager, said: "We are happy to add the 120MB drive to the range of SupraDrives. This addition reinforces the fact that the Supra range is by far the most extensive and professional of any hard disk drives in the UK market. We expect the 120MB version to be as successful as the other sizes of drive."

Frontier Software P.O.Box 113,
Harrogate, North Yorkshire HG2 0BE.
Tel: 0423 67140

Silica shop packs

Despite the 520STFM's price rise earlier this year, Silica Shop appear to still have limited stocks of the pre Summer Pack STs at £299. These STs have 0.5MB RAM, single-sided disk drives and the new TOS ROMS. The Summer Pack ST, at £399, has 0.5MB RAM, a double-sided drive, and the old TOS ROMS for compatibility with the £400-worth of games software also bundled with the Summer Pack.

It also appears that Silica are able to offer the 520ST-Ms again. This would represent the most cost-effective overall method of buying a new ST. The 520ST-M is available without drives for £199, with a single-sided drive for £269, and with a double-sided drive for £299. The Terminal Emulator ROM Cartridge (£39.95) plus a drive-less £199 520ST-M makes a very cost-effective terminal.

Silica Shop, 1-4 The Mews,
Hatherley Road, Sidcup,
Kent DA14 4DX. 01-309 1111

Low-cost Linotronic

Linotype Ltd, the makers of the Linotronic 100p PostScript imagesetter, an example of the output of which you are reading at this very moment, announce the worldwide launch of a new, low-cost, high-resolution PostScript imagesetter - the Linotronic 200p. It is sold as a complete unit with the PostScript RIP (Raster Image Processor) and the laser diode recorder unit as integral parts. The Linotronic 200p will support any personal computer that outputs in the PostScript page description language, which includes the ST.

The imagesetter is available in two models with different output resolutions, imaging capacity and storage capacity. Model A has a top resolution of 1270dpi, whereas Model B has a top resolution of 1700dpi, with greater disk capacity, and it can also handle halftone work. Users can select typefaces from The Linotype Library, which currently contains over 250 fonts, and this number is increasing every day.

Linotype Limited, Bath Road, Cheltenham, Gloucester
0242 222333.

Hard drive - 25M

Interesting news from Met Com of Wigan, for those envious of the cheap hard disks available for the PC clones. Met Com are distributing the Third

Art Director in textile design

Martin Brown, a young freelance designer working from a studio in London's Docklands, has taken the Atari ST personal computer into the world of textile design. Using a 520ST colour system and Mirrorsoft's Art Director software, Martin has spent the last 6 months working up a portfolio of original fabric and wallpaper designs which have been favourably received by industry giants like Dorma - even though many of these companies have computerised design systems costing many times more than an ST.

Mirrorsoft are also offering a bargain ST design bundle. Art Director, and its sister program, Film Director, are being promoted as a combined package, priced at just £49.99. Until now, the two packages purchased separately would have set you back £109.98!

Art Director is a sophisticated design program offering a wide range of facilities. Film Director can take in designs created in Art Director (or other ST art packages) and edit elements of them together to produce animated sequences. The Art Director / Film Director pack is available through most ST software stockists.

Martin Brown can be contacted on: 01-481 0734
Mirrorsoft Ltd. Headway House, 66-73 Shoe Lane, London EC4P 4AB.
Tel: 01-377 4645

Atari ST Reference Books from Abacus Software

You Can Count On

Presenting the Atari ST

A detailed summary of the capabilities and features of the Atari ST for new and intending users.

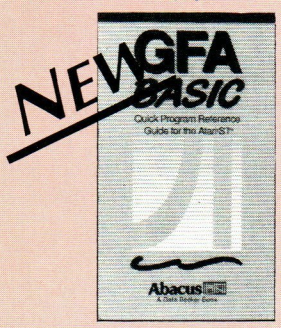
The first section covers what a computer operating system does and why the Atari ST is truly user-friendly, and includes a brief discussion of the software included with the ST system. The second section describes in greater detail the actual components and operating system, from the 68000 processor to the GEM interface.

BKAB 980 179 pages **£12.95**

The Atari ST for Beginners

With its icon-based operating system the ST is ideal for a beginner, although many aspects of the ST can be confusing to the first-time computer user. This informative book will help you learn the essentials of the Atari ST without problems. Topics include: Set-Up and connection, TOS< GEM and application programs, introductions to BASIC and LOGO programming, and a glossary of computer terms. Full of ideas for putting your Atari ST to work.

BKAB 525 203 pages **£12.95**



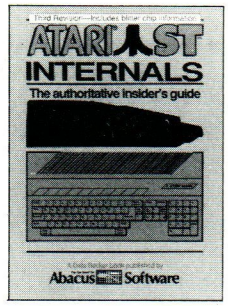
GFA BASIC

Quick Program Reference Guide for the Atari ST.

The GFA BASIC Quick Program Reference Guide is a powerful tool for programmers using one of the most popular BASIC interpreters for the Atari ST.

Designed for the intermediate and advanced level programmer, its easy-to-read, easy-to-locate organization finds commands, their uses and parameters in a flash. With its clear alphabetical listing, Quick Index and compact format, the GFA BASIC Quick Program Reference Guide is truly instant information at your fingertips.

BKAB 555 214 pages **£9.95**

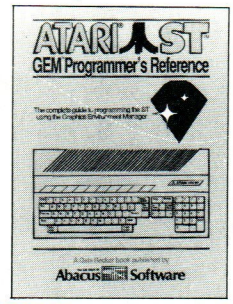


ST Internals

(Formerly Anatomy of the Atari ST)

An essential guide to the insider's information on the ST. Written for the programmer wanting a thorough, complete description of the inner workings of Atari's outstanding ST computers. Detailed descriptions of graphics and sound chips, hardware, the Centronics and RS-232 ports, GEM, important system addresses and much more. Included is a commented BIOS assembly listing. This reference work is a required addition to your ST library.
Third printing.

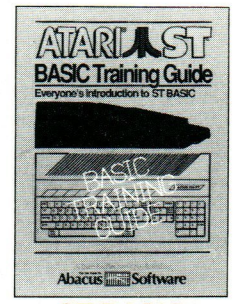
BKAB 450 446 pages **£14.95**



GEM Programmer's Reference

An indispensable guide for the serious ST programmer needing detailed information on GEM. Written especially for the Atari ST, it has an easy-to-follow format. Covers choosing the right programming language, introduction to C and assembly languages; a study of the Editor, C-compiler, Assembler & Linker; programming the Virtual Device Interface (VDI); Application Environment Services (AES); Graphics Device Operating System (GDOS), and interfacing to TOS. Many example programs, Cross-referenced VDI/AES calls.

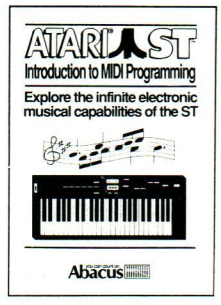
BKAB 470 412 pages **£14.95**



ST BASIC Training Guide

An educational, well-written introduction to Atari ST BASIC. You'll learn to program your ST quickly with the BASIC commands, problem analysis, and algorithms presented in the first few chapters. Quizzes throughout the book help you learn to think in BASIC while you get a practical grounding in the language at the same time. Topics include data-flow and program flowcharts, menus, multi-dimensional arrays, sort routines, file management, BASIC under GEM, advanced programming techniques, and much more.

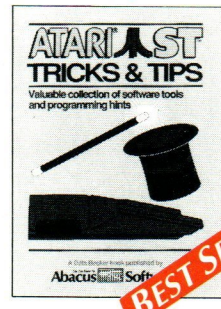
BKAB 485 312 pages **£12.95**



Introduction to MIDI Programming

Your ST's built-in Musical Instrument Digital Interface (MIDI) lets you control any MIDI-equipped digital synthesizer – and the results can be phenomenal! This book covers the fundamentals of MIDI operation on the ST–how a synthesizer is actually interfaced with the ST's MIDI ports. Includes C source-code listings for comprehensive MIDI editor, driver and animated player for any of the Casio CZ series, etc. Written by the authors of XLENT Software's ST Music Box™ package.

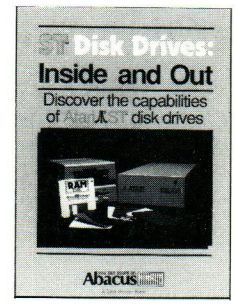
BKAB 520 250 pages **£14.95**



Tricks & Tips

Fantastic collection of ST program tools and techniques for the ST. Programs include a super-fast RAM disk; time-saving print spooler; colour print hardcopy; plotter output hardcopy; accessories construction - all of these programs and more are included in the price of the book! Learn how to create brilliant graphics, use the VDISYS commands, and master the powerful GEM applications. Refine your BASIC, assembler and C programs with advanced programming techniques.

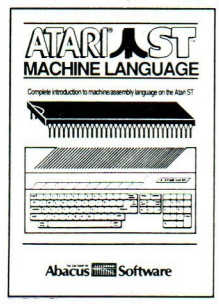
BKAB 455 260 pages **£14.95**



ST Disk Drives: Inside and Out

The definitive guide to the ST disk drives, including the Atari ST Hard disk. This exhaustive volume not only covers files, file structures and data management, but details both the programming and technical aspects of the floppy drives, hard drive and RAM disk. Includes program listings for several full-length utilities and programming tools that allow you to further explore the capabilities of these drives.

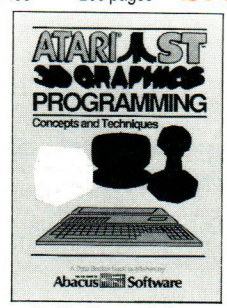
BKAB 445 375 pages **£16.95**



ST Machine Language

Learn 68000 machine and assembly language to make the fullest use of your ST. Takes a systematic approach in presenting number systems, logical operations and bit manipulation; use of registers, structure and details of the 68000 instruction set and the ST system routines; explains the functions of the editor, assembler, linker, etc. Contains many sample programs.

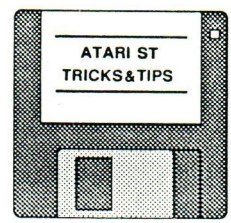
BKAB 465 280 pages **£14.95**



3-D Graphics

Teaches ultra-fast 3-D graphics techniques in 68000 machine language. Axial rotation, zooming and shading of 3-D objects. Learn the mathematics and data structures behind 3-D graphics. Topics include transformation and projection of one dimensional figures to 3-D, hidden line removal, shading, introduction to 3-D CAD. Complete with 3-D patternmaker and animator.

BKAB 550 351 pages **£16.95**



Optional Program Diskettes

Available for all of our ST Reference Library titles. The diskettes contain most of the programs found in the text of the book, saving you the time and trouble of typing them in on your keyboard.

Each diskette **£9.95**

Available from your local dealer or directly from

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6 Park Terrace,
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Surrey KT4 7JZ
Telex 8955021 Precis G
Fax 01-330 2089

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_____

(Credit Card Number)

Expiry Date _____ Signature _____

_____ Postcode _____

Coast Technologies' range of Atari ST low-cost hard disk drives, which come fully formatted and ready to go, with full utilities and software disks included. Auto-booting is possible, the usual high-speed DMA transfers, and the drives support up to two internal hard drives.

Third Coast have performed benchmarks which show that it is faster than the Atari SH205 and comparable in speed to the Supra range. All drives are housed in a robust cabinet which includes PSU, a cooling fan and fully-fused power switching. Six month's support and maintenance is included in the purchase price, with a choice of cabinet designs and colours.

Prices and capacities are as follows:

25MB	£399
30MB	£449
50MB	£599
64MB	£849

Met Com, Unit 8, Bradley Hall Trading Estate, Standish, Wigan WN6 0XQ. Tel: 0257 426464

The software bears

RPS, 'Europe's leading floppy disk manufacturer', want to be the first to remind us that Christmas is on its way. They are offering purchasers of High Focus 3.5" or 5.25" disks an early Christmas present, if you can bear it.

During October through to December 15th, RPS is offering a choice of two cuddly teddy bears with purchases of High Focus disks. If you order 50 disks, you receive the RPS 'Honey Bear', and for 100 disks you get the RPS 'Scotty Bear', both manufactured to British Standards.

Customers of High Focus disks not only receive this quality gift, but are also guaranteed a disk which is 100% error free. To add to the festive spirit of giving, RPS can arrange through its nationwide network of distributors for your teddy to be donated to a local children's hospital on your behalf.

RPS Ltd. High Street, Houghton Regis, Beds LU5 5QL. Tel: 0582 867222

Crown at the DTP show

Crown Computer Products will be at the Desktop Publishing Show, London, October 1988, exhibiting a very low-cost laser printer. They claim to have a well known £1745.00 (MRP) laser printer, featuring full HP Laserjet capability, available at a considerably lower price. There are mumblings of about 50% of MRP even. The printer has a full 12-month warranty, with on-site maintenance contracts available. The printer is the Centronics PP8 Laser printer. Look out on Stand C10 at the DTP show.

Crown Computer Products, 210 Moss Lane, Burscough, Lancashire L40 4AZ. Tel: 0704 895815

Magnetic Images fonts and clip art

In answer to the growing demand from ST desktop publishers for more professional fonts, Microdeal are supplying the new Magnetic Images Fonts and Clip Art disks for use with Publishing Partner from Softlogik. There are six fonts disks and five clip art disks in the series, all available separately in clear plastic boxes. The disks cost £14.95 each.

The fonts disks are as follows:

Disk 1:	Avant Garde, Courier and Calligraphy.
Disk 2:	Times, Helvetica Narrow, 16 Bit.
Disk 3:	Chancery, Bookman, Chicago.
Disk 4:	Palatino, Schoolbook, Computer.
Disk 5:	Pi symbols, Dingbats, 8 Bit.
Disk 6:	Complete set of 11 Laserwriter screen fonts.

The clip art disks contain:

Disk 1:	Computer 1, Office 1, Newsletter 1, Seasons 1, School 1.
Disk 2:	Business 1, Sports 1, Holiday 1, Religious 1, Computer 2.
Disk 3:	Travel 1, Medicine 1, America 1, Personal 1, Music 1.
Disk 4:	School 2, Animals 1, Food 1, Borders 1, Old West 1.
Disk 5:	Tools 1, Pirates 1, Party 1, Hands 1, Transport 1.

The font disks contain both medium and high resolution screen fonts plus the relevant printer fonts. The fonts supplied should appeal to those using Publishing Partner on PostScript output devices such as the Apple LaserWriter Plus, which has many of the above-mentioned fonts as standard. The clip art images are standard Degas high resolution *.PI3 files, with *.PI2 files also included. The images can be used in a wide variety of desktop publishing situations, from club newsletters to small business advertising.

Microdeal, Box 68, St. Austell, Cornwall PL25 4YB. Tel: 0726 68020

Audio Software

For the first time ever, a complete guide to music software is available for users of computer-based music systems, in the form of a catalogue produced by the new London-based company, Audio Software Ltd. The first issue of the catalogue reviews over 160 music software titles currently available for the ST, as well as the Mac, Amiga and PC clones. It turns out that there are over 70 different music programs for the ST! Audio Software was formed by the Audio Rents group of companies, prominent in the professional recording field in the UK and the USA.

Audio Software is also interested in hearing from anyone who has written, or is developing, music software for the ST.

Audio Software is on 01-722 4655

Artificially intelligent STs

Inferences of Chatillon, Paris, have announced that they have developed, and are now marketing, software for Artificial Intelligence running on the Atari ST. These are 'ILISP', a Lisp interpreter, 'FPROLOG', a Prolog interpreter, and 'LE SPECIALISTE', an expert systems development tool. All these packages are fully compatible with GEM and run on all ST computers. FPROLOG and LE SPECIALISTE are available in English, with ILISP following soon.

Further information can be obtained from: Inferences, 26, av de Paris, 92320 Chatillon, Paris, France. Tel: 46.55.99.11.

Pecan must be nuts

Pecan, who have already supplied the Open University with 22000 units of Pecan Pascal, are now offering PDQ Pascal. Yes, you guessed it, it stands for Pretty Darn Quick Pascal, and it's aimed at the first-time user of Pascal and the frustrated Basic hacker who needs to go Forth and step up to a structured programming language, to C what it is like,

probably finding it rather Modular, too.

PDQ Pascal is supplied with an Integrated Development Environment, Full Screen Editor, Pascal Compiler, and utilities to write your first Pascal program. The manual has been written with the first-time user in mind, and all at the rather agreeable price of £29.95 including VAT!

Pecan Software Europe, Victoria House, 10 Kellaway Avenue, Henleaze, Bristol BS6 7XR. Tel: (0272) 425012

Free disks from Compumart

Compumart are offering two free 3.5" disks with its disk storage boxes, from its range of storage systems for all sizes of floppy disks. Made from high-quality, anti-static, impact-resistant plastic, and designed for maximum storage efficiency, they are lockable for added security. The 3.5" box holds up to 70 disks and is available with two free blank 3.5" disks, and comes complete with dividers. They cost £12.95 (incl. VAT). This price includes first-class delivery and same-day despatch.

Compumart Ltd. Jubilee Drive, Loughborough, Leics. LE11 0XS. Tel: 0509 610444

Dead mice and trackerballs

Silica Shop plan to offer the Marconi RB2/PC7 trackerball, built to professional standards, for top-end CAD and design applications. Expected price is to be around £59.95. Incidentally, those of you who have been suffering from mouse lead problems can possibly find a solution at Silica Shop. They can get hold of replacement mouse leads for about the £8 mark. The snag? They are out of stock, and don't know when Atari can send more. Apparently, the last time they had 200 in stock, they went in a matter of days! The other snag? Atari have apparently changed the internal design of the mouse in the past six months, according to John Hambley, of Silica, and the new meece's leads, although being more reliable, have different internal fittings. Contact Silica Shop in the first instance, for latest news on non-availability, compatibility with your mouse, and current price.

Silica Shop, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX. 01-309 1111

Expansion Cards for Mega ST

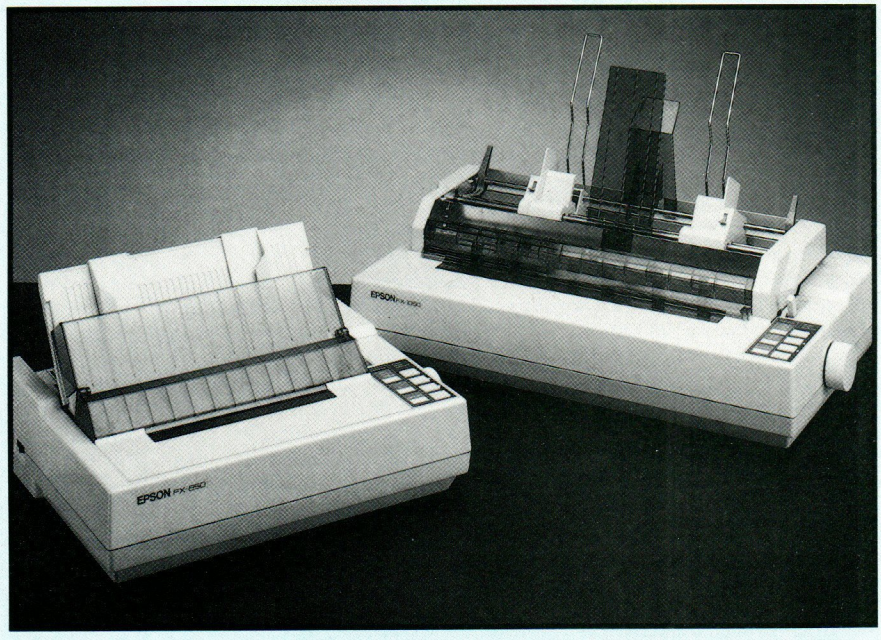
H.C. Andersen Computer A/S, of Kastrup, Denmark, can now offer expansion cards and OS-9/68000 serial drivers for the Atari Mega 2/4 ST. The Mega can now feature full multitasking and multi-user environments. The maximum number of users on a Mega 2/4 is six. 520s, 1040s, Megas or PCs can be hooked up as user terminals. The press release states: "the expansion card is based on 1.ST card basis and one or two 1.ST card SIO, each with two serial ports. 1.ST card basis fit direct to the Atari Mega internal expansion port and it is easy to install. OS-9/68000 is an operating system in the Unix family, supported by Basic, Fortran, C, Pascal, and 4GL sculptor. "

Prices were given in US dollars, ex-VAT etc. - check before you buy.

1.ST CARD BASIS	US$270
1.ST CARD SIO with two RS-232c ports	US$170
OS-9 Operating System Personal V2.2	US$295
OS-9 CADSIO Driver/descriptors t2-t5	US$265

H.C.Andersen Computer A/S, Englandsvej 380, DK-2770 Kastrup, Denmark. Tel: (45) 152 4404

Epson add simultaneous paper handling



No more wasting time unloading and reloading between cut sheets and continuous paper. This facility is already available on three of Epson's 24-pin, letter-quality printers - now the FX850, and the wider carriage FX1050 have this facility too. Up to four-part continuous paper is preloaded and held 'parked' in the built-in push tractor feed at the rear of the printer. In this configuration, single sheets can be printed.

Draft speeds of both models are now 10% faster than previous models. Lower noise levels, too, are also evident, being below 55dBA in operation. The FX850 and FX1050 have two built-in NLQ fonts - Roman and sans serif. Eight international character sets are available. The printers have an 8K buffer, which enables the user to store up to 240 specially designed characters, such as logos, scientific symbols and special graphics. Options include a single bin cut-sheet feeder with envelope feeding capability, a pull-feed tractor, particularly useful for labels, and a roll paper holder for the FX850. The prices remain the same - the FX850 at £459, the FX1050 at £599, both ex-VAT.

Epson (UK) Limited,
388 High Road, Wembley,
Middlesex HA9 6UH.
Tel: 01-902 8892

Mixing with the best

Larking Audio, Soundtracs' UK distributor, has appointed The Synthesizer Company as their exclusive London dealer for Soundtracs' full range of mixing consoles. The Synthesizer Company prefer to approach studios from the viewpoint of the musician / songwriter and producer, who form the largest section of their client base. In July, The Synthesizer Company sold an unprecedented four IL consoles. Among the purchasers were studio owner Norton York, and Alan Wilder of Depeche Mode, for whom TSC has completed a private studio installation based around the IL36/32.

The Synthesizer Company Ltd,
9 Hatton Street, London NW8 8PR.
Tel: 01-258 3454

Atari Corporation news

Atari Corporation announce from Sunnyvale, California, their second quarter results, including results from Federated Group Inc, a recent Atari acquisition. Atari reported net sales in the computer and video-game sector for the quarter, of $101.5M - an increase of 44% over the same quarter last year. Atari Consolidated report net sales of $164.6M for the same period.

Sam Tramiel, President of Atari Corporation, observed that the computer and video-game segment continues to grow at a healthy pace, and that the video-game market, especially in North America, is very strong. Demand continues to outstrip supply in Australia, Europe and Canada. The continuing shortage of DRAM memory chips is limiting production, and having an effect on Atari's efforts to attack the US market. They feel the DRAM dearth will ease by the first quarter of 1989.

Atari UK's managing director, Bob Gleadow, has revealed that his company is to make its 'biggest ever commitment' to an end-user show - the three day Atari Christmas Show, the final exhibition on the 1988 computer calendar. When the doors open at Alexandra Palace on November 25, visitors will find the giant Atari feature stand dominating the scene in the West Hall. The theme for the show is 'Atari in Entertainment', with the inevitable emphasis on games, games and more games in the run-up to Christmas.

Database Exhibitions, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP. Tel:0625 878888

On-line yuppies

A brand new magazine devoted to technology-hungry yuppies is the latest addition to the range of on-line services published by Telemap Group. Using a computer and modem to dial up British Telecom's Prestel Dialcom computer network, users can now access Xtra Voltage - a weekly mix of news, reviews and features on CDs, HiFi, video, cellular telephones and other electronic gadgets in demand by today's yuppie. However, Xtra Voltage is aimed at anyone interested in technology and gadgets - it's not necessary to access the service in a BMW with a portable computer and a cellular telephone (thank goodness for that!). Users with access to Prestel or Micronet should type out *Xtra# on their computers to read Xtra Voltage.

Telemap Group Ltd, Durrant House, 8 Herbal Hill, London EC1R 5EJ. Tel: 01-278 3143.

Precision open in Texas

More Z88 to ST link software

Richard Seel reviews another program which will transfer files from an ST to a Z88. This one comes from a rather unusual source.

In issue 28 I wrote about the value of the Cambridge Computers Z88, and reviewed a program which allows you to transfer files from the Z88 to the ST (and vice versa). Readers may be interested to know that the July 1988 edition of Personal Computer World contained a listing of a transfer program written in GFA Basic by Andrew Littlefield.

This program, ST-Link, is now available as part of the PCW disk library series, at a cost of £5. For this you get the source code, basic instructions on disk, and a runnable .PRG file of the program. The program is not protected, and will work in both high and medium resolutions.

I have now had a chance to use this program, and it seems ideal for my needs. In particular, it can do the thing I want: convert PipeDream files into First Word format, keeping all formatting and style commands, as well as taking care of nasties such as the Z88's endearing way of writing %PC% for a percentage sign. (This only applies to single-column documents such as you would ordinarily produce in a word processor. Multi-column documents cannot be converted with First Word style codes because they must be saved in Z88 'plain text' format before being transferred.)

The program uses GEM menus which means that you can configure your RS232 with the control panel if necessary (I had a bit of trouble initially, because I was not using XON/XOFF on the ST, although I was on the Z88). The work screen is divided into four areas: three corresponding to the receive, send and print functions, and one which gives a list of the files you have transferred.

The pull down menu gives the list of conversion options. I haven't tried them all - in particular, I don't have a 1-2-3-compatible spreadsheet, so I couldn't test that option. But assuming that it works, this feature will be of great interest to anyone with both a Z88 and either VIP or Logistix.

As I said above, the transfer from Z88 to ST in First Word format works fine. The reverse is also true: you simply type 'r' for receive in the Z88 Imp/Exp utility and press return twice. Then click on the OK box in the ST Link dialogue. Now you get a file selector box. Choose your file and it will be sent to the Z88, using the same file name. If it is a First Word file, all style characteristics will be transferred into the Z88.

The print option also seems to work OK. It uses the ST's parallel printer port to output text from the Z88 using the print out command from within PipeDream. I tested both single and multi-column documents. I had no trouble with an ordinary word processor file, but an address list didn't work quite so well.

When I tried to print the first two columns I had no difficulty, but I was unable to print the first three. This may have been because the third column did not always have entries in it, or for some other reason connected with the Z88, rather than ST-Link. However, I also was unable to print out the Diary so I think there might be a problem with the software.

Because ST-Link is written in GFA Basic, it suffers from some of the limitations of that language. In particular, it is not able to cope with a redraw message. So, if you use, say, the control panel, the ST-Link screen will not be redrawn after you have finished with it. It is possible to access GEM window calls from GFA Basic, and as the source code of ST-Link is available, you could always try 'improving' it.

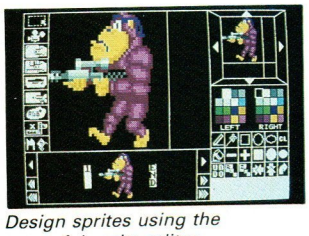
But the complaints are minor. For £5.00 this is a very useful piece of software. It's certainly the one I will use.

Product: ..... **ST-Link**
Author: ..... **Andrew Littlefield**
Publisher: ..... **Personal Computer World**
Price: **£5.00**

UNLEASH YOUR IMAGINATION WITH

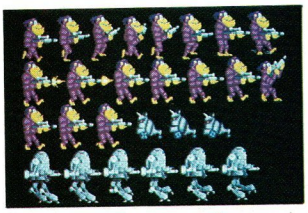
STOS

The Game Creator

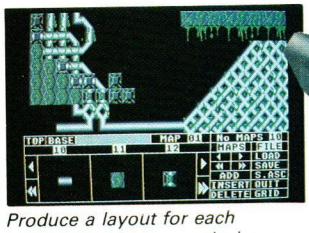


Design sprites using the powerful sprite editor

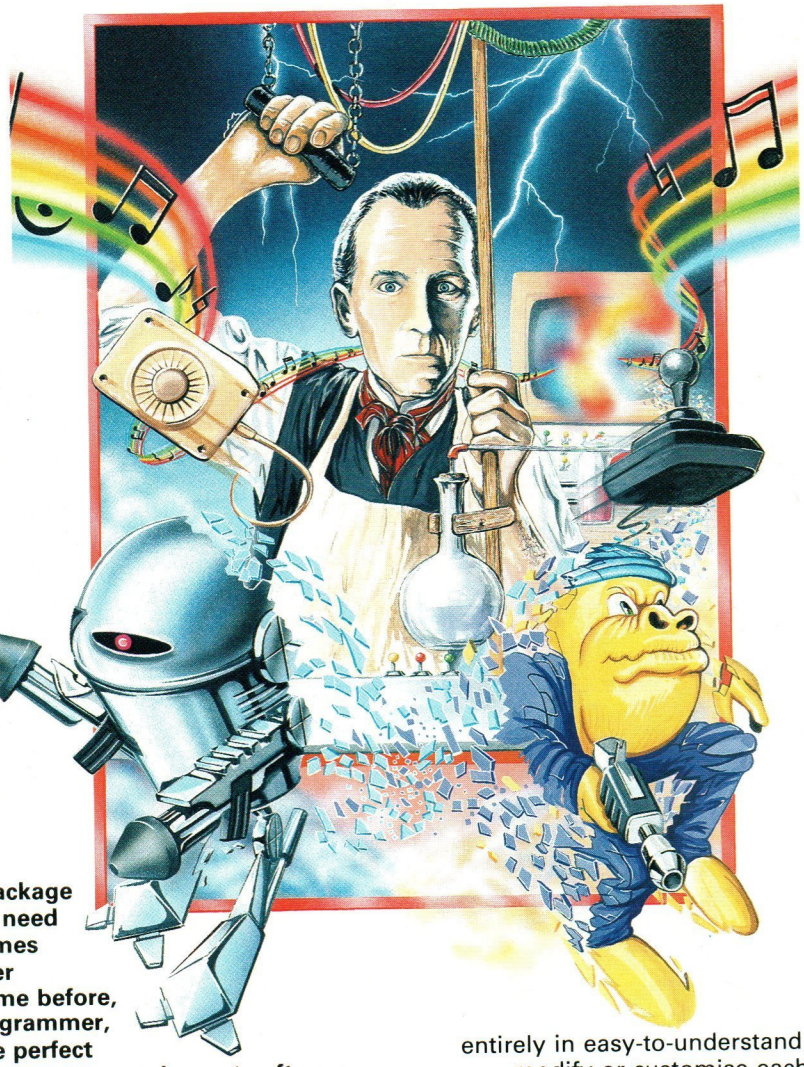
Set the sprites in motion with the animator section

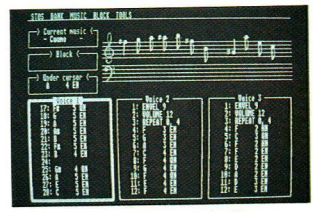


Choose from a range of example sprites included with STOS

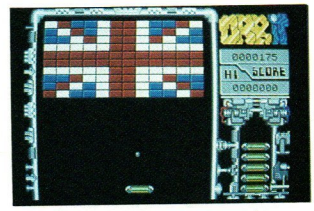


Produce a layout for each screen with the room designer



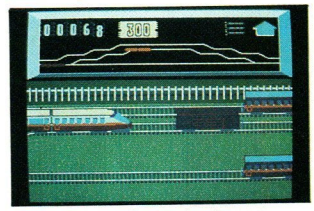


Create dynamic sound effects and compose a suitable score



Construct devious screens in the feature-packed Orbit game

Draw the flight paths of the attacking aliens in Zoltar



Blast the carriages in the horizontal-scrolling Bullet Train

STOS is a revolutionary package which has everything you need to create fast, exciting games quickly and easily. Whether you've never written a game before, or you're a competent programmer, you'll find that STOS is the perfect way for you to design your own entertainment software.

PLUS: Three *free* fast-action games which show you just what can be achieved with this unique package. There's Zoltar, Bullet Train and Orbit – and each game is written entirely in easy-to-understand Basic, which means you can modify or customise each one to your heart's content. Change the sprites, music, difficulty level, design new screens and so on. And by examining the programming you'll learn how to create your own games from scratch.

The STOS package comprises:

- A massive manual packed with easy-to-follow examples.
- At-a-glance reference card putting all the commands at your fingertips.
- Three discs containing: STOS Basic, sprite editor, room designer, character set editor, icon editor, music editor, screen compacter . . . plus many other utilities and short programs.
- An exciting opportunity to join the STOS Club for expert advice and contact names.

All this for just £29.95?

You'd better believe it!

Please send me **STOS – *The Game Creator*** at £29.95 (incl. VAT and P&P).

☐ I enclose a cheque payable to Mandarin Software

☐ Please debit my Access/Visa number:

Expiry date: /

Signature .....

Name .....

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.....

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MANDARIN SOFTWARE

Send to: **Mandarin Software, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.**

Enquiries: 0625 879940

Order Hotline: 0625 879920

A546

Here's just some of the facilities that will be at your command:

• 340 powerful and versatile commands • Move and animate up to 15 sprites at once • Sprites any size up to 64 x 64 pixels • Full collision detection between each sprite or zone • Grab sprites from commercial games • Define up to 16 different types of scrolling areas • Hold up to four main programs and 12 accessory programs in memory at once • Create pull-down menus with just one command • Change modes from within a program • Overlay up to 13 windows • Compact Neochrome or Degas screens – or even sections of screens • Zoom and reduce pictures to produce incredible effects.

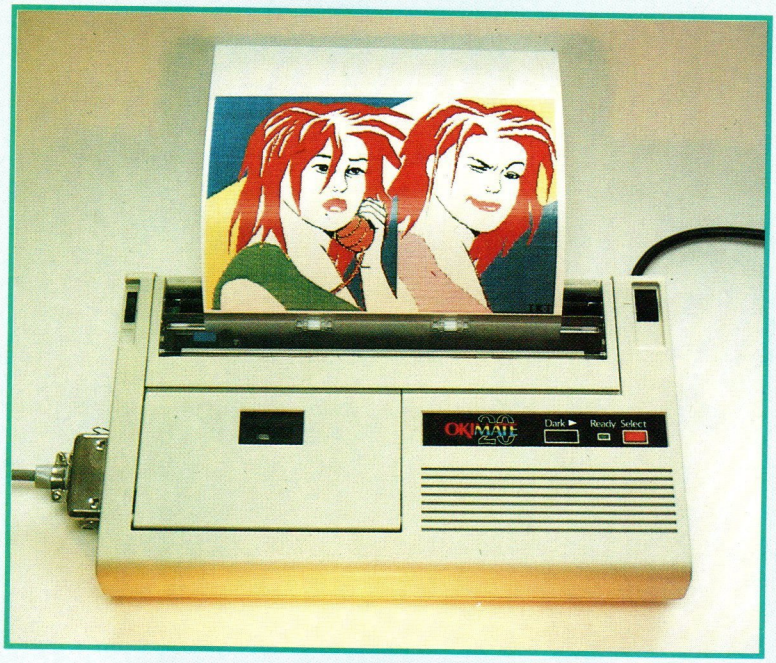
Okimate 20 Colour Printer

For some, the idea of a colour printer automatically conjures up images of money leaving your bank account - lots of it. In this case, the printer in question costs only £149 .

The Okimate Colour Thermal-Transfer Printer, available from LAN Computer Systems, is basically a thermal printer with colour capability. If you are not using the Okimate 20 as a colour printer, you have a choice of printing methods - thermal paper (which needs no ribbon), or thermal transfer ribbon on reasonably smooth paper. For colour you must use the special colour thermal transfer ribbon on a smooth paper.

The Okimate 20 is available from LAN Computer Systems, included in the package is a roll holder, one colour ribbon, one mono ribbon, a roll of thermal paper, the Degas Elite package (which has 2 Okimate drivers), an IBM printer driver disk (?) and two manuals - one for the IBM software and one for the printer itself.

The Okimate 20 is a small printer - 330mm wide, 190mm deep and only 60mm high. Despite its compact dimensions, the power supply is built-in. Sprocket-feed fanfold paper, single sheets or continuous rolls of paper can be used. For continuous rolls, a plastic fitment is supplied which you assemble using an Origami-like folding procedure indicated on its packaging. Although it looks and feels unstable and inadequate, it appears to work.



The maximum paper width is 254mm, so you cannot use A4 sideways. The left side is occupied with the input port, mounted on a removable personality cartridge. The rear is mainly clear, except for the mains lead which is out of the way in the right-hand corner. The right side is where the mains switch lives. On the top the controls may be found; there is a paper release lever for loading single-sheet paper and also for allowing fanfold paper to be used. There are two lids, one for paper loading, and one for the ribbon cartridge compartment.

The top panel controls consist of a five-position switch for darkness, a green LED for power and online status, and a red button which pauses the printer. There are no line-feed or form-feed controls at all, the single red button will act as a form-feed if held down for a certain length of time. The only means of moving the paper accurately in the printer is a very small rotational thumbwheel, which moves the entire carriage directly.

Running costs

How much do you have to spend once you've bought it? For colour, the manual states about 10 screen prints per ribbon, although it is possible to squeeze 14 from one ribbon. The print head needs cleaning after four colour ribbon changes, and eventually needs replacing too. The black ribbon is quoted as lasting for 120K characters. The snap-in head is very easy to change, as are the ribbons. If you use thermal paper, you will not need ribbons, but will be limited to monochrome. Other removable personality cartridges are available - for IBM Centronics and serial.

Using Degas' Okimate 20 driver, a screen - 203 * 135mm area - takes about 11.5 minutes to print out in colour. Normal character printing speed is quoted as 80cps, correspondence quality as 40cps, graphics as 60cps and 24-dot graphics as 40cps. The highest graphics density is 120 * 144dpi, with a line spacing of variable n/144.

The Okimate 20 creates a colour image on paper in the following way: The print head is a 24-element head, the elements of which heat up the ribbon, melting the ribbon's wax coating onto the paper. In mono, the ribbon is a continuous black wax. In colour, however, the ribbon consists of a small black mark followed by a clear stretch; these act as a synchronisation mark. Following this, the ribbon is yellow for the width of the carriage, then magenta for the same width, then cyan, followed by another sync marker, and the cycle repeats. In colour printing, the software must locate the sync marker, then print the yellow image in one pass, then the magenta image without moving the paper, then the cyan image on top, and this creates a colour image.

There will always be differences between what you see on the screen and what the Okimate prints. The printer

Precision Software Ltd., Surrey-based publisher of database software, announce the opening of an American subsidiary based in Dallas, Texas. The new subsidiary, Precision Inc., will provide distribution and technical support throughout North America for Precision's established range of Superbase products, and Logistix, the spreadsheet product - acquired by Precision Software in March 1988 as part of their European expansion.

Precision Inc. is based at:
8408 Sterling Avenue, Suite A, Irving, Texas 75063, USA.
Tel: (214) 929 4888

Precision Software Ltd. are at:
6 Park Terrace, Worcester Park, Surrey, KT4 7JZ, England. Tel: 01-330 7166

First European Computer Training Show

uses subtractive mixing, i.e. starting with white and mixing down to black. To print black, it prints solid yellow, magenta and cyan in the same place. On a monitor screen, colours are created additively, from black to white. If there is no signal, black occurs by default, and white is created by equal solid red, blue and green. Colour differences are also partly the fault of the driver software not being intelligent enough - if you were to write your own, you could possibly achieve some interesting results.

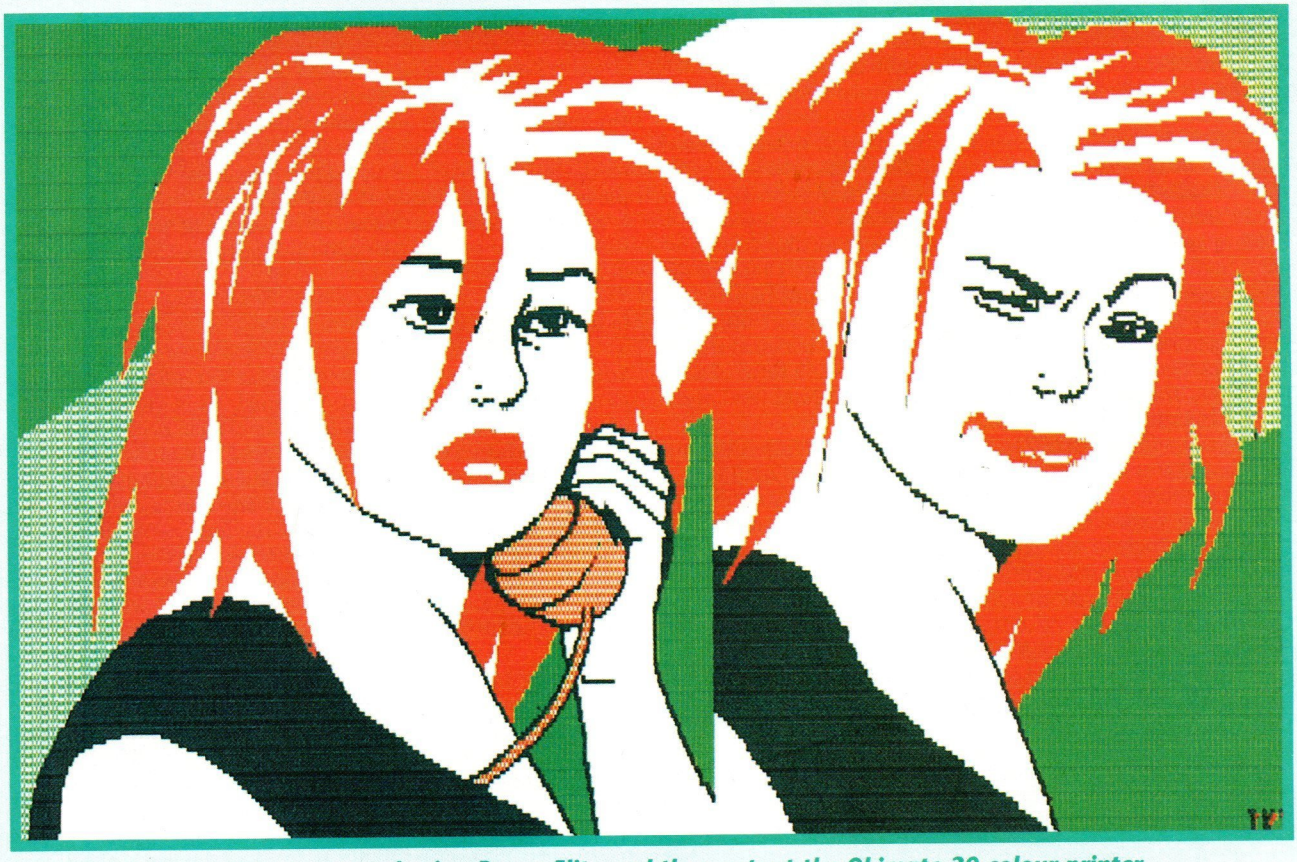
24-element printing

Although the Okimate 20 contains a 24-element print head, don't be misled - it does not act like a conventional 24-pin printer as the elements do not overlap and the driving method is different. For most purposes, treat this as a 9-pin printer, unless directly programming the head yourself. The reason for the number of pins seems to be so that it can get away with not having to move the paper when doing micro line-feeds. This does not seem to work very well, when used in mono mode the Okimate 20 could not produce satisfactory output from a GDOS program, like Wordup, with the FX80.SYS driver. Unfortunately, there does not appear to be a GDOS driver written specifically for the Okimate 20, in either mono or colour.

In correspondence quality mode (dipswitch or software settable) the printer appears to take advantage of its 24 elements by producing a rather usable monospaced typewriter-like font. It does this by using a 14 * 14 character grid. In printing from some of my Degas pictures, the Okimate 20 totally wrecked the colour balance of the subtler tones. Either it or the Degas printer driver seems incapable of rendering muted tones, preferring to create strong colours and, in many cases, wrong colours. The only way you will get accurate results is by only using strong primary colours.

For the programmer interested in graphics, this could be something to get your teeth into as there is obviously more that can be done with this printer than most programs seem capable of. It is also recommended if you need to print Degas colour screens at low cost, although watch the cost of your consumables. Dividing the cost of a colour cartridge by the number of dumps per ribbon - that's about 79 pence plus - means every dump you do has to be a winner.

Product: ....Okimate 20 Colour Thermal Printer
Retailer: ..... LAN Computer Systems
Price inc. VAT: £149.00
Black ribbon: £4.95
Colour ribbon: £7.95
Phone: 01-597 8851
Reviewed by: ..... Ian Tindale



This graphic was created using Degas Elite and then output the Okimate 20 colour printer.

Providers of computer training services are to have their own full-scale exhibition, The Computer Training Show, in 1989, held at Olympia from 30th May to 2nd June. "The Computer Training Show will reflect the diversity of services offered across all the major categories of training, including the traditional classroom approach as well as CBT and interactive video", said Mike Blackman, Director of Montbuild Ltd, the organisers of the show.

Montbuild Ltd, 11 Manchester Square, London W1M 5AB. Tel: 01-486 1951

END

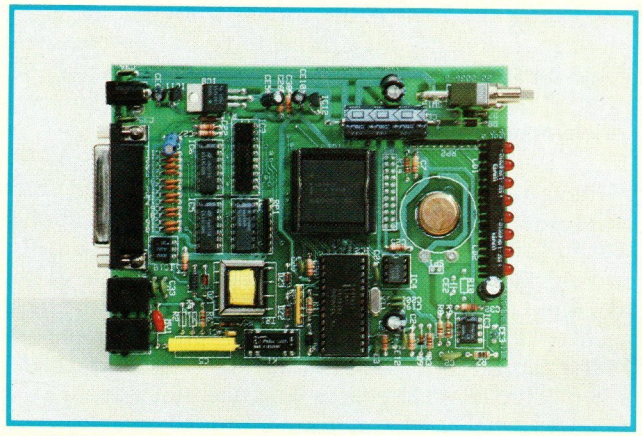
more.....

The SupraModem 2400

The SupraModem 2400 manufactured by the Supra corporation in the US and distributed here in the UK by Frontier Software of Harrogate, N. Yorks, is an excellent, intelligent modem, offering baud rates up to 2400 baud, with full Hayes compatibility.

One of the things most people seem to want to get into, soon after they get a computer, is communications - or comms, for short. The first tentative ventures into the world of comms usually go along the lines of: get the cheapest possible modem you can afford; try it out all night for the next three months finding your way around the BBS scene; get a phone bill which resembles your phone number; put modem away, wishing you'd bought a faster modem in the first place in order to spend less time online; cry.

Modems come in various types and categories. The cheapest ones will be manual operation, and offer 300 baud and 1200/75 baud. With 1200/75 you can get onto Prestel and similar viewdata services, and ordinary BBSs at 300 baud. At a speed of 300 baud everything happens rather slowly, considering that it's your phone bill at stake! The time you will spend uploading / downloading at 300 baud will be effectively cut in quarter at 1200 baud full duplex. And half that again, logically, at 2400 baud. It makes sense to buy as fast a modem as you can afford.



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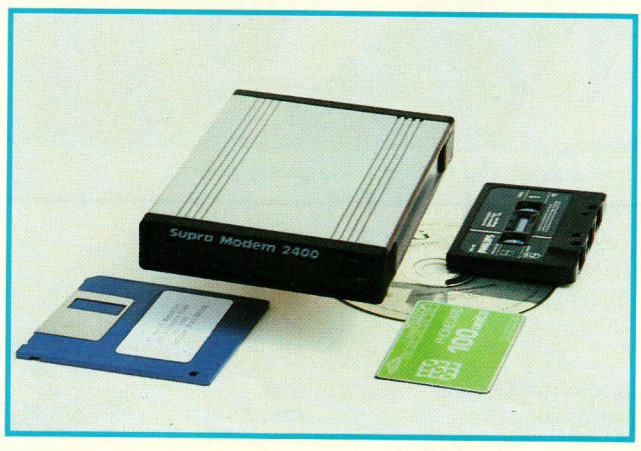
The case is aesthetically very pleasing, looking very tough and yet neat. It consists of an aluminium extrusion, into which the PCB fits, held in place by a screw and a metal pillar. The back and front of the case are injection-moulded plastic parts which clip onto the case. The back and front seemed a little less robust in comparison, but very smart, nevertheless.

On the back panel are sockets, from left to right: Power input 9V dc (2.5 watt power consumption); RS-232c female 25-way 'D' socket; line and phone jacks - American type. The LEDs on the front indicate the following conditions: high speed (2400 baud operation); auto-answer; carrier detect; off hook; receive data; transmit data; terminal ready; modem ready. There is only one switch - the power on / off switch on the front panel.

One of the most impressive things about this little modem is its small size. It is not much larger than a personal stereo. This is helped by the use of a separate PSU, in the form of a 9V plug pack. The overall dimensions are: height 32mm (incl. feet); length 169mm; width 117mm.

The SupraModem 2400 is intelligent, offering full auto-answer and auto-dial, and both tone and pulse dialling. There is a programmable non-volatile RAM which can store a configuration profile consisting of: one telephone number; number of rings after which to answer (for auto answer); duration-of-test timer; tone or pulse dial; auto answer mode; command echo / no echo; phone jack type (for US market); RS-232c interchange circuit choices; speaker volume; communication rate; guard tone selection; make / break ratio.

When you buy a SupraModem 2400 you get: the modem; an RS-232c cable to connect the modem to the serial port on the ST; a 9Vdc PSU plugpack; a phone lead with a UK Telecom plug at one end and an American-style plug at the other, which plugs into the modem itself; a manual; a handy reference card for the SupraModem 2400's Hayes command set. Also included is a compuserve offer, which gives free time on the system.



You get no software with this modem. This allows you to choose from the many packages around on the ST. If you are not sure, try Uniterm, initially, as it is PD. As the SupraModem is standard Hayes-AT command compatible, you will have no difficulty driving it from virtually any comms package.

The biggest minus point against the SupraModem 2400 is the fact that is does not have BABT approval, i.e. that green triangle sticker. Instead, it has the red circle PROHIBITED sticker on the modem itself and on the box packaging. This theoretically prevents you from legally using it on BT's phone lines. If you use a non-BT telephone system, then you will possibly be in a suitable situation to make good use of this excellent little modem.

In use

You can log on to normal BBS systems at 300, 1200 or 2400 baud, all at CCITT standard - i.e. V21, V22 and V22bis. There is no 1200/75 split-rate speed, which means this cannot be used to access Prestel and other Viewdata services on 1200/75.

Due to its tiny dimensions it can be put almost anywhere, as the PSU is in the mains plug-pack and the supplied RS-232c lead is as long as you'd sensibly need. Having a metal chassis gives it a bit of weight so the cables do not end up dragging the box around. There are four rubber feet on the underside and it can sit quite comfortably on top of an STF or STFM without being obtrusive at all.

Conclusion

The SupraModem 2400 is an excellent modem for the price. It is hard to find any V-22bis modems at all under £200, let alone such a nice, compact, well-made one. However, there are three main drawbacks: lack of V-23 (1200/75 baud, for Viewdata services); use of an American phone jack on the back, for connection to a telephone; and the fact that it is prohibited from connection to British Telecom's lines. Nevertheless, it is an excellent buy, as it is a top-class modem.

Product : ..... **SupraModem 2400**
Distributor : ..... **Frontier Software**
Price : **£199.95**
Phone : **0423 67140**
Reviewed by: ..... **Ian Tindale**

Flexidump

There are times when it would be useful to have a stand-alone graphics printer dumper, which can simply print out a picture, obviating the need to enter the graphics package it was created on. There are one or two public domain printer dumper utilities, which do purely that. It would also be useful to have total flexibility when selecting the size, orientation and position of your picture dump. For this, a little more is needed. The solution could be Flexidump, by Zitasoft, sold through Care Electronics in Watford.

Flexidump is a GEM-based picture dumper which can take a picture file and print it out to a dot-matrix printer with various enhancements and alterations, and at a number of printer densities. Flexidump works in mono as well as colour, and will run on 0.5 MB RAM using a single-sided drive. Flexidump won't work with an Atari Laser printer, until total Epson emulation becomes a reality. Pictures can be printed out at a near-ridiculously wide range of sizes, from 1mm to 10m. In addition to being a mere picture dumper, Flexidump will also make the task of creating multiple labels very simple. Any picture file can be used, in Neo and Degas formats, created in any resolution. Colour is converted into grey scale intelligently. This picture can then form the basis of your label design, poster design or whatever.

The program has a permanently available on-line help feature. This has been implemented carefully, and the whole concept works rather effectively. From anywhere in any process, you can call for help if in doubt. The wording would seem a little 'public domain' in its style, for a product which costs money. I feel that the spelling mistakes should have been removed.

There is a capable configuration program, also GEM-based, allowing you to configure Flexidump for most dot-matrix printers in a variety of modes, including triple-pass quad-density. Many options are provided in both the configuration program and Flexidump itself to set up the correct dimensioning for single-width label printing. Printout can be sideways, upright, negative image, stretched or cropped. Pictures can be spooled to disk for use in a multiple picture printing setup for not only labels, but letterheads and other applications.

If you need to produce labels for a product, posters, letterheads, etc., then investigate Flexidump. It is very good at taking a picture file and faithfully preserving its optical effect at any size, particularly using the 3-pass mode, and the enhance mode - although make sure you have a good supply of print ribbons! Flexidump has a primitive graphics editing facility. It is not intended to be thought of as a paint package, but even so, the drawing tools are very limited and possibly unfriendly. As a label-maker / picture dumper / poster-maker, Flexidump is a very comprehensive tool.

Product: ..... **Flexidump**
Author: ..... **Zitasoft**
Publisher: ..... **Care Electronics**
Price: **£29.90**
Phone: **0923 672102**
Reviewer: ..... **Ian Tindale**

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Just days after the event...

The 1988 PC Show Report

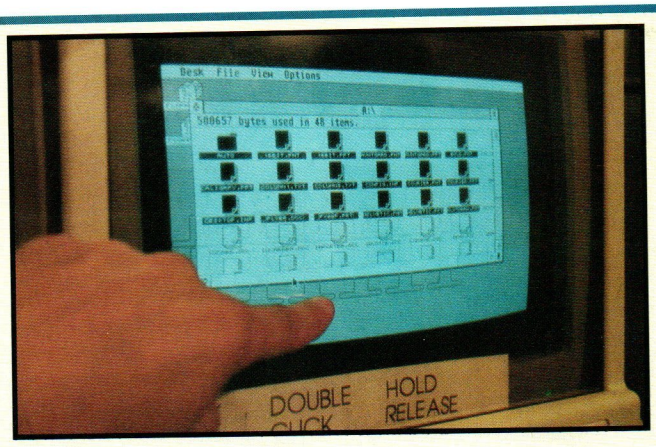
This year's PC Show (previously PCW) was held at Earls Court, from Wednesday 14th to Sunday 18th of September. Compared to past PCW shows, this one seems to be no more impressive than before. The venue, Earls Court - a couple of traffic jams away from Olympia, had even worse access and lacked the interesting split-level main hall offered by Olympia. The whole show was staged on one floor, divided into three areas; the result was quite cramped in places, but with a clearer division of interests, not too bewildering.

In the midst of this very subdued atmosphere were no dramatic new product launches, no mind-blowing razamatazz surrounding some new piece of kit which we then all wish we could afford. Perhaps this shows the industry is stopping to catch its breath, and the show-going public could absorb what there was of interest at a more leisurely rate. Some stands would be showing more of the same - i.e. what they always sell - and some stands would surprise you with something new without making an awfully big fuss about it. There was a certain contingent of 'coming real soon now' vapourware, as usual.

The show was divided into 3 sections: a main hall; a business hall; and a leisure hall. Each had its own entrance. The business hall, as expected, was dominated by machines other than STs. The Leisure hall was full of games and related stands. The arcade manufacturers were also present, and as usual, the showmanship was very over-the-top. The central hall seemed to be a mixture of the two - literally the middle ground, and possibly the most interesting area for ST owners, covering home, small business and major application areas.

In the midst of this very subdued atmosphere were no dramatic new product launches.

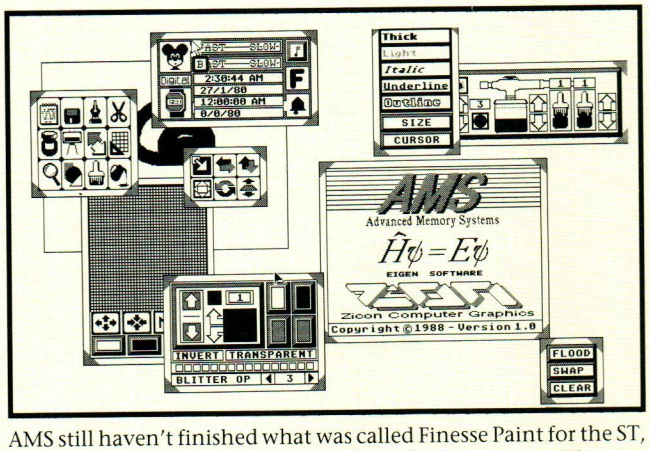
The ST was very much in evidence in the central hall, being easily the most seen computer. Silica Shop's big stand was a place for show bargains in both hardware and software. Many different large screens and 'mega-screens' were in evidence - SDL were showing the MegaVision ST19 on which ran an unfinished Publishing Partner Professional. Eidersoft, demonstrating Campus, had each of their machines networked into a PC using a Nine Tiles network. Telemap were expounding Shades, their multi-user leisure activity, InterBusiness and Micronet, and also their expansion into France via Minitel. HiSoft were doing good business with their range of proven programming langauge products and a few utilities including Turbo-ST - which speeds up the GEM environment.



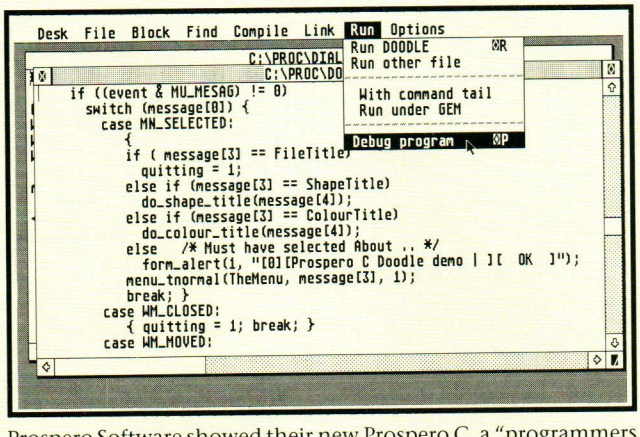
Eagle Business Computers of Cardiff (of Magic Disk Toolkit fame) were showing a very interesting touch screen (top left), which works well and feels very intuitive. Basically a mouse replacement, it connects to the RS232 port and runs with a special software driver. It can be fitted to any monitor of the size of the screen, and even taken off and used on a surface as a graphic tablet of sorts. Estimated price should be under the £400 mark.

The MIDI aspect was small in size but present nevertheless (left). Manufacturers like Roland and Yamaha were seen among the stands of specialist MIDI people such as Soundbits and The Synthesizer Company. Good to see lots of different and well thought out packages appearing for the ST. One thing that the PC show did highlight was the fact that the ST is definitely in there and competing as far as the music scene is concerned

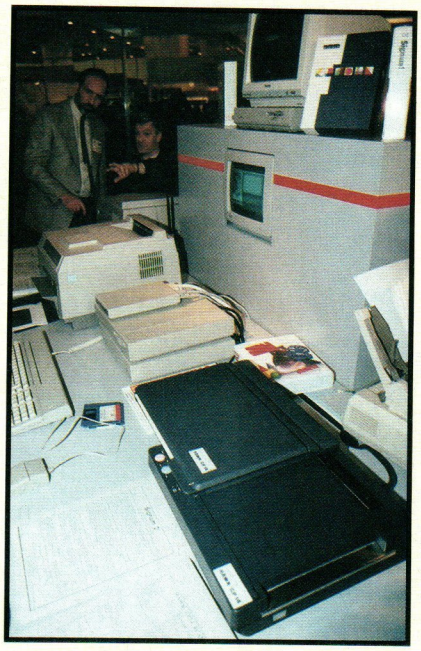
Perihelion drew a lot of attention - mutterings and mumblings of 'transputer' and 'Atari Transputer Workstation' were heard from the interested crowds always present around their stand (right). A large 500MIP cage of Transputer farm cards (top right) was busy impressing passers-by, working and flashing away, performing the usual graphics demo's which people now automatically associate with transputers. One day someone may show us something else impressive using transputers which DOESN'T use graphics! The word 'Abaq' was not in evidence at all, with the much more elegant 'Atari Transputer Workstation' being heard rolling off peoples tongues.



AMS still haven't finished what was called Finesse Paint for the ST, only now apparently it's going to be called Flair Paint. This is a rather impressively specified graphic package which uses a totally different user interface than that which most ST owners are used to, and also seems to be a desk accessory. It is very highly iconic in it's use, and can pixel edit right down to the 300dpi resolution of the Atari Laser. When (if?) they finish it, it should be one to look out for.



Prospero Software showed their new Prospero C, a "programmers environment for the ST". A complete implementation of the proposed C standard, one of the first to conform fully to the proposed ANSI standard. Demo disks were available - at least for the first day. Featuring: expansive libraries provided, with a 68881 library following shortly; no limits on the size of code or arrays; syntax checking and 1000 pages of documentation. It looked very good, too. Introductory price of £99.95 for a limited period.



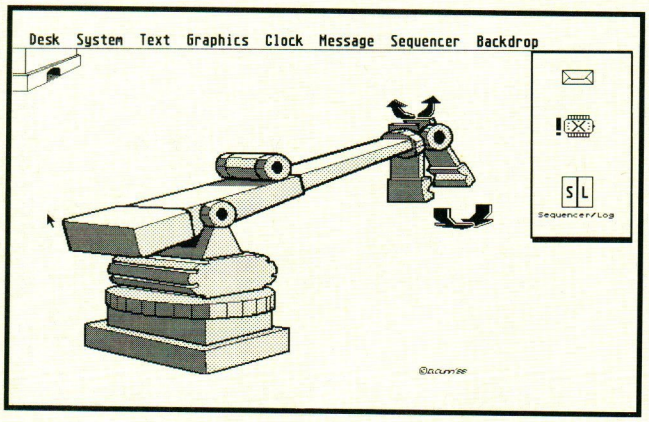
Atari themselves were showing Calamus - well received in Europe, it is now poised to make an impact here in the UK. Calamus is a DTP application using dedicated font descriptions, allowing a vast range of accurate type-sizes to be derived from one 'description' of each font.

It is capable of some impressive results using the Atari Laser printer. Calamus is seen here running on a megascreen (top left).

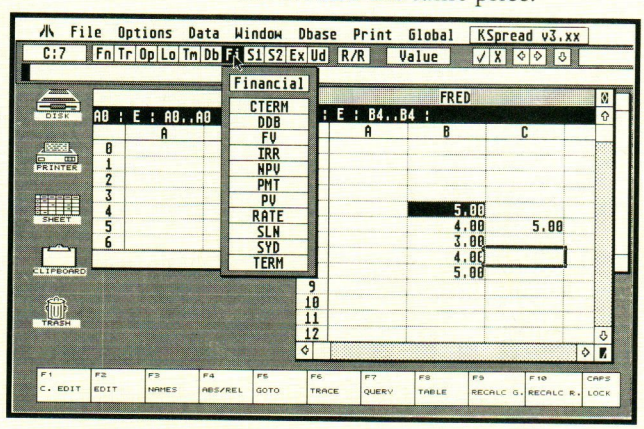
Signa were exhibiting in true professional style (left) showing the Hawk scanner with its OCR software. CRP tablets of both sizes were being demonstrated on the stand, Signum 2 seen at work, Aladin 2.10, and for a little light relief, the game of Bolo.

The A-Net networking system from Atcom (top right), consists of a master computer and up to 26 slaves (nodes). The master acts as a fileserver and an intelligent peripheral sharing device. The interface box (right) uses fibre-optics to communicate - these lines are very thin and light and do not suffer from electrical interference. As a result of opto-electronic technology the network can operate at distances of up to 40 metres maximum. The power for the network boxes is taken from the joystick port. Currently the speed is 2.7Kbits per second - in 1989 this will be upgraded to 46Kbits per second. Later in 1989 the developers also expect to produce Mac / PC slave devices. Estimated

costs are around £700 for the entry-level system consisting of a master, two slaves, all the fibre-optics needed and the software. Extra slaves will cost around £100, and booster modules allowing greater distances will be available for around the same price.



The Atari Robokit was there in spirit, although not in person - human or robot. There was a Mega ST running Atari Robokit software, going through the motions with no actual Lego things to control, and unfortunately none of the Personal Robots team were there on the first day to talk to people. For more information on the story behind Atari Robokit, see the cover feature this issue. Atari hope to market the Atari Robokit very soon now. This consists of software and an interface board. Your own robot-ware has to be supplied yourself.



Kuma were showing several upgraded products. K-Spread 3 (above) is a power-packed comprehensive spreadsheet. 'Lotus' style commands are combined with GEM operation. K-Spread 3 will load Lotus, DIF or ASCII files and supports sideways printing on FX80 compats. Multiple worksheets can be loaded, limited only by the RAM available, and this combined with multiple windows and access to cells in other worksheets gives the functionality of a 3D spreadsheet. K-Graph 3, K-Minstrel 2 and K-Resource 2 were also introduced. K-Spread 3 will cost £89.95.

Dusseldorf 1988 Show Report

My reasons for visiting Atari '88 were several; to see what was new, what the German market was really like and how were the software and hardware companies promoting their products at the show?

There were two halls full of ST's, surrounded by peripheral products. The difference between the two was very marked, with Hall 1 containing the professional side of the ST. Hall 2, on the other hand, was cut-price hardware, games and Midi. What was interesting was that the twain never seemed to meet, despite the fact there was no barrier between the two halls.

So began the task of looking for what was interesting, as well as looking for the new. My first impression was that there were very few colour monitors to be seen anywhere and even less 1040's. This was a 'Mega mono.' show, with mainly 4's on view and yet nothing startlingly new as far as concepts and ideas went.

The other point worthy of note was the 'explosion' of the large screens with two manufacturers offering their wares - MacroVision of France (who were showing through SoftPaquet of Holland) where the thrust was Aladin running on the big screen. In fact, PageMaker was running on their configuration and looked impressive. The other was Matrix Daten Systeme with their big screen and 'ST Tower' system. Different applications seemed to run on these two screens which could be confusing for a user trying to figure out which would be of most use! I saw Campus 1.3 and Calamus (yes, really) running on the Matrix Daten Systeme and Aladin on the Macrovision version. I was assured by both that any program written under GEM rules will run without difficulties.

Atari's own stand boasted the Abaq, which didn't seem to create a vast amount of interest, but more curiously, there were two very lonely-looking 286's. This then was a 'Mega Mono ST' show - full stop.

DMC (Design, Marketing and Communication) had a very large stand showing Calamus alongside a Heidelberg printing press. Calamus, as always, looked impressive and rumour has it that it is about to be released. Two stations were demonstrating it, but they were not excessively busy. For the moment though, only time will tell, but it has to be said that potentially it is a brilliant product producing stunning print quality where the Atari Laser is concerned. It will be a 'must' here too when it is released.

A new angle on hardware came from IPB. They have taken an ST, shrunk it, re-cased it and, hey presto! a mini ST, but with the same large keyboard. The price - around 4,000 DM - £1275.00.

A new Canadian CAD program called DynaCADD was on show. Curiously, it felt and looked somewhat like Calamus in terms of its user interface. It is to be marketed in Germany by DMC. Toolbox (the Campus people) were on the stand opposite showing Campus Version 1.3. on the Matrix Daten Systeme MegaScreen and did not seem in any way to be perturbed by this new arrival.

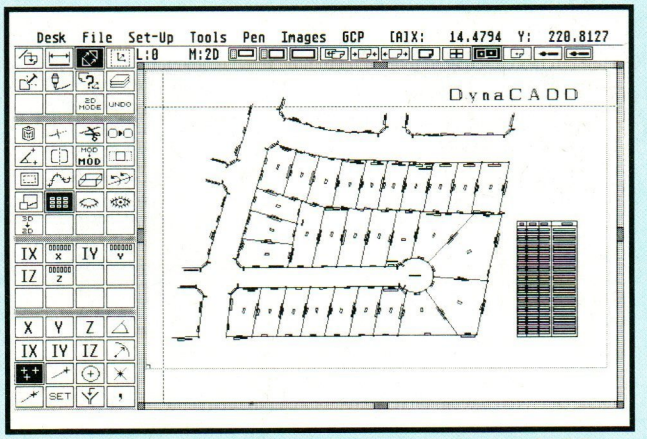
Scanners were both in evidence and abundance. Silver Reed, Print Technik, Marvin, CTK etc., were all showing their own versions of the basic Silver Reed photocopier unit. A new scanner from Panasonic was being shown by Marvin AG., as well as the latest level of Scansoft which had some interesting new features in it. The Panasonic scanned at 200, 300 and 400 d.p.s.i. and up to 64 grey levels, again using Scansoft. Their OCR system (Augur) received a lot of attention as did their high-resolution colour graphics board, 'Assist'.

Application Systems Heidelberg were showing some recently released and soon-to be-released products as well as more well-known products. Interestingly, these new products are geared to both the mass and professional markets and are to do with 'moving pictures', as it were. One product (IMagic) was related to creating colour shows for product demos. etc., with the other (Creator) being what looked like a very slick and smooth cartoon generator.

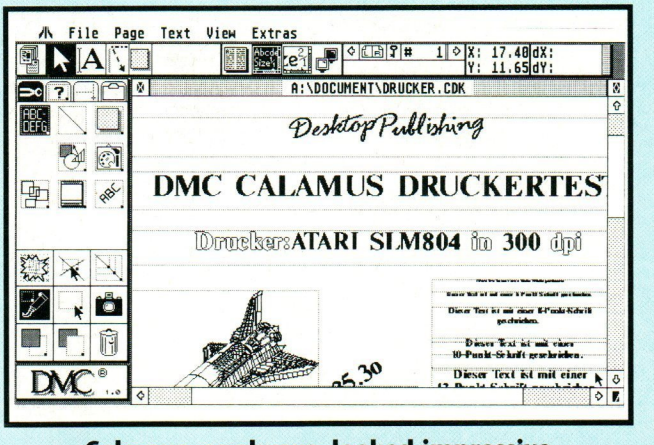
Whilst I had expected to see a number of communications packages (software and hardware) running, there were very few in evidence - to be precise - one. The apparent reason for the lack of comms hardware seemed to be placed firmly on the shoulders of the German Post Office where it seems to be both difficult and expensive to have a product accepted. Deja vu?!

Hall 2 took about three minutes to go around in terms of the mental energy which required expending. It was really much like the shows here with a strong 'market trading' approach taking place. The UK side of the ST was represented in this area. The well-known 'Hairy Yak', in the form of J. Minter Esq. (Llamasoft) could be seen on the first day shooting around Hall 2 like one of his super light-shows.

The hall was already packed to capacity. This one view suddenly made me realise that the ST has an amazing ability (plus some marketing provided by someone) to pull in the crowds, with some people having come from as far away as Munich in the South and Hamburg away to the North, and yet there was nothing really new. From the users to whom I spoke and listened to, it seems that a new version of an existing product is enough reason for a pilgrimage. The business of following the user-base's needs, which subsequently creates a loyal following was prevalent. Even people who don't own ST's were flocking in to see, learn and even buy. There is no doubt that the ST is regarded as a serious computer - not a business computer perhaps, but certainly a professional one.



A new Canadian CAD program called DynaCADD



Calamus, as always, looked impressive

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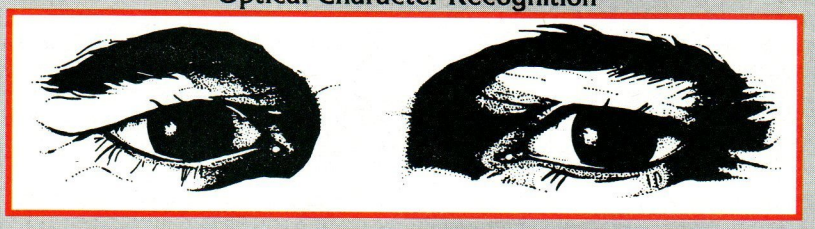

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Hawk CP14 Scanner

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13 good reasons and 1 excellent one for launching

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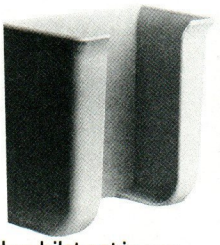

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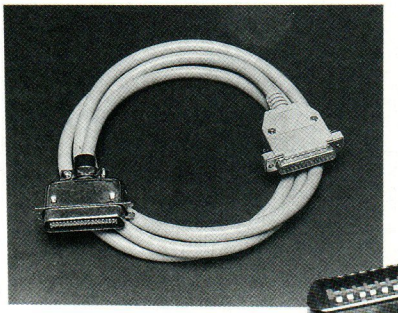

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ST WORLD I/O

A radical new reader information exchange

I/O has really taken off! We seem to have struck upon a need among our readers for an informal information exchange facility, not unlike a bulletin board, but in magazine format. We are getting a wide variety of letters on all subjects related to the ST, both replies and new discussions, with several people contributing to several threads at once in their letters. Due to the volume of correspondence, I can only print the most representative of the letters, which will still ensure a balanced coverage. As Philip Taylor of Glasgow states, first or fore names are welcome! More contributions from the staff of ST World, (at least those not called Ian Tindale) are coming in, and this can only be a good thing (although they will not be eligible for prizes!).

This month we see the continuation of some interesting threads the software-for-the-deaf discussion seems to have become international, with possibly a solution from Belgium. Whether this still fits in with British Sign Language I don't know. Marc Thatcher's original queries in STW30 seem to have elicited many offers of help.

Two addresses for further contact, subjects which have aroused a lot of interest. Firstly, Mr E.G. Richards, of last month's 'Genealogy and computers', can be contacted at 2 Peckarmans Wood, London SE26 6RX, and secondly, sending an SAE and disk to Stewart Burns at 14 Tickleford Drive, Weston, Southampton SO2 9AU will result in his drive B booting program being sent back to you.

Letters are accepted, or you can Fax us. If you feel you have to send a disk in, it could be months before you see it again, but if you do want it back, include postage stamps and a return label. Single-sided - saved as ASCII or ST Writer format is helpful.

The prizes on offer for the three best letters each month consist of a 12-month subscription to ST World (or ST Action, if you want). If you already subscribe, we will simply add 12 credits to your existing sub. So, GET INVOLVED!

ST World I/O is edited by Ian Tindale.

Write to: ST World I/O,
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PO19 1SR
Fax: 0243 789809

512 colours on TV

Started by D. Lee, STW29, p29
+ Quantum paint on MC05, Steve Bradshaw, STW30, p35
+ 512 colours software gened, Roger Cain, STW30, p35
+ 512 colours at 50Hz, Craig, STW31, p24
+ On owning an MC05, Steve Ridd, STW31, p24

We could have a lead

Attention all you frustrated ST owners with Ferguson Monitor / TVs in the MC range. I have an MC01 with an Atari STM, and I have never been able to get a decent picture. My dealer gave me a lead when I purchased my ST, but warned me that the picture would be very bright. Sure enough, it was. As you know (perhaps) when the MC01 detects the RGB signal, the colour and contrast controls are disabled, and therefore will not be able to affect the picture. The brightness control works, but the result was still too bright.

I then purchased a lead made up from a mail order firm. The result was exactly the same as before, and £13.95 wasted. After several months of eye-strain while using 1st Word, etc. I decided to try and sort it out myself.

I searched through all the old mags and found several solutions, most involving resistors in the Red, Green and Blue signal lines, and one with a diode in the Vertical Sync line. I tried all these with no success. I dismantled my 'made-up' lead and found three resistors in parallel with the RGB lines - no use at all, as electricity takes the path of least resistance. So I put them in series. Slightly better! How about more resistance?

Eventually, I ended up with 1500 ohm (1K5) resistors in the R, G and B lines, and one in the vertical sync. Rather than solder the resistors in the plug, I made a small 'dongle', with a plastic adaptable box, a 7-pin DIN plug, a 7-pin DIN socket, some Veroboard and about 12 inches of screened cable. I now have a working monitor after 8 months of eyestrain. I hope this helps people out. Total cost of the parts required works out at about £3.00, all available from any electronic store. If anyone wants me to make one up for them, I'd be happy to do it for £7.50 including postage.

Clive Parker, 14 Cross Lanes, Pill, Bristol, Avon BS20 0JQ

Assisting the deaf

Started by T Dale, STW28, p100
+ Assisting the deaf, Alan Ackers, STW29, p29

Striking a chord

As a dedicated Signum user on my Mega ST4, I welcome ST World I/O as an excellent innovation in an excellent magazine. The first information exchange feature in the July issue had a question from another reader regarding software for the ST to assist the deaf. This struck an immediate chord because of my life-long involvement with profoundly, prelingually deaf people. I see computer technology offering hope for a new avenue to help deaf children to acquire easier and better comprehension of the grammar and syntax of the language of the hearing world in which they live. Is there any software for this purpose available for the Atari ST?

Dr. Harry Blackmore, Perth, Western Australia.

more.....

Sign language in Dutch

I am looking for programs for deaf people too, I have read your letter with great interest. Up to now I could not find one yet.

Therefore I wrote one myself. I enclose some screendumps and a help text (in Dutch) to give you an idea of it. The purpose of the program is to help train (hearing or deaf) people in the use of the so-called 'Finger Signs'. This language is sometimes used by certain non-verbal people, or to spell some abbreviations or proper names which have no conventional gestures.

The program shows immediately the finger sign, when you type a letter. While doing so, the typed letters are remembered, so when you select the exercise option, those signs are displayed and you should type the corresponding letter. When you give a wrong answer, both signs are displayed for comparison.

The next option allows you to enter words, terminated by a return. All signs of the word are then displayed one after the other. The words you learn are also remembered, and can be saved in a dictionary. These dictionaries are normal ASCII files, which could also be created with any other text editor or word processing program. You can then exercise these words. The speed with which the signs are flashed on the screen can be modified at any time by a single mouseclick.

The last option displays all 26 signs on screen. When you point at one, the corresponding letter is displayed. In exercise mode, it shows a letter and asks you to point at the corresponding sign.

The program is in the public domain, but it uses the Dutch language of course, in its menu, messages and help text. If you see any use for this program, I would be glad to send it to you, if you could send me a translation of the help text, or if you think that my English is good enough. Finally, if you encounter other programs, please let me know. If, on the other hand, you have any specific ideas for a useful program for the hearing impaired, I might be interested to implement it on the Atari ST.

Rudy Claerman, Gent, Belgium.

European TOS

Started by Marc Thatcher, STW30, p36

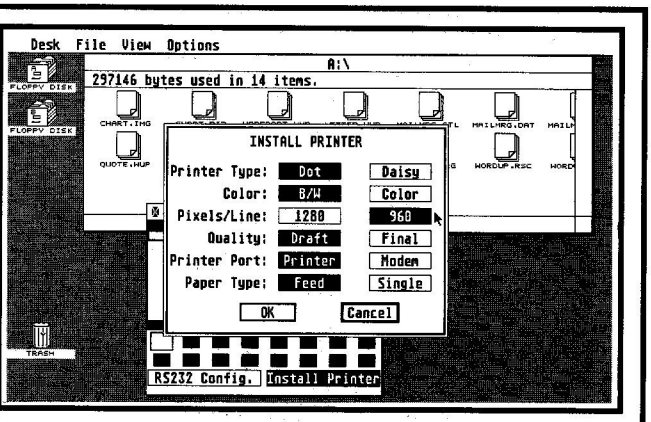
Six solutions

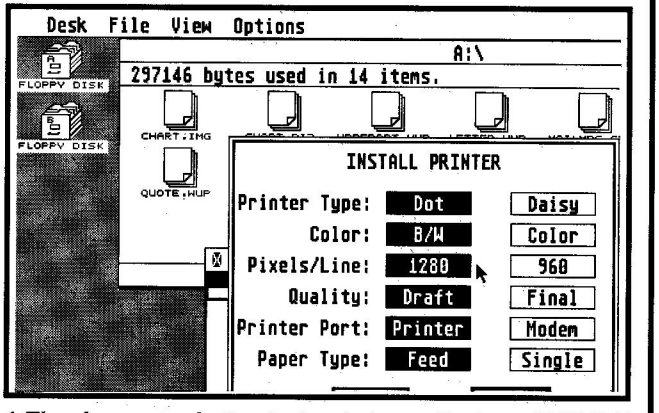
In answer to Marc Thatcher's query, here are some suggestions:

1 Try using Atari's DESK1.ACC (control panel) to set the pixels per line as 960 - see screen dumps enclosed, which illustrate why the problem may be arising in the first place.

2 The easiest way of sending codes to the printer from within a GEM application is to use the typewriter function in Back-Pack, remembering to have the printer turned on. Converting ESC sequences is made easier by the inclusion of a calculator which will do hex to decimal, and which can be opened on the screen next to the typewriter.

3 A rather less elegant solution is to use K-Switch2 to hold Basic in another part of memory and send the codes as before.





4 The cheapest solution is simply to run Basic and LPRINT the codes as Marc already does. Although this doesn't answer the question of sending codes from within an application, as long as the printer is not turned off it still works perfectly well. I used to use this technique in the early days to set the number of lines / inch when using 1st Word.

5 A solution limited to 1st Word (and compatibles) is to insert an unused character in the text and enter the required command string in the driver translation table against that character.

6 Many '80 column' printers will take slightly wider paper - that is to say, A4 on its side with a bit trimmed off (totally non-standard!).

Charles Quekett, Clunderwen, Dyfed.

No cursor blinking

The blinking cursor has nothing to do with TOS. It is a result of starting the program from the desktop. Many .TOS programs leave either a blinking cursor or a small black rectangle. To solve this, run Maxidisk RAM disk from an Auto folder (or just ignore the blinking thing). You can write a small ASCII file which has one line: 350 C and save as MAXIDISK.INF: This will configure, for example, a 350KB RAM disk in drive C. Place your accessories in it for ultrafast booting.

Andreas Ramos, Aarhus C / Denmark.

Mouse Paws

Started by Neil Wesston, STW30, p36

More mouse problems

Another mouse problem that occurs frequently is prema-

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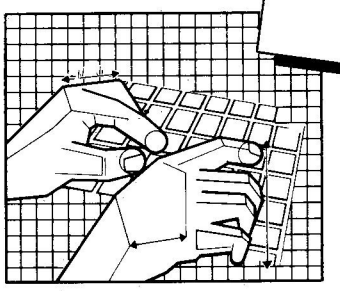

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ture left button failure. The simplest repair is to warm up the soldering iron and swap left button for the right. Has Neil been using a mouse mat? I couldn't do without one of the spongey ones, but dislike the hard ones. P.S. I am sure most readers give their mouse an internal spring clean occasionally. The result is a revelation!

Charles Quekett, Clunderwen, Dyfed.

Signum Fonts

Started by S Windall, STW30, p36

To put it into context

Yes, a company called Context. Contact Signa for more info.

Charles Quekett, Clunderwen, Dyfed.

Fonts found in Germany

Contact Signa. The Germans, at least, have some 250 fonts for Signum 2.

Andreas Ramos, Aarhus C / Denmark.

GDOS fonts

Started by Ian Tindale, STW30, p36

Found fonts in Fleet Street

If Ian would like to buy the PostScript driver for Fleet Street Publisher, he will find some of the fonts that he envies. If he does not have a PostScript printer, he can send his files to Nikki Appelbloom at Star Lasertype (01-483 2326).

Charles Quekett, Clunderwen, Dyfed.

Being left behind?

Fonts in their various forms - including computerised data - are protected by copyright. PostScript fonts for laser printers, Macs etc. sell for £150-£300. Anyone blatantly copying Letraset fonts is liable to incur the wrath of the copyright holders, who are very greedy people with lots of lawyers.

My company has a 1040STFM and a QMS PostScript laser printer with 35 fonts. Driving this with an ST is not without problems. GDOS applications like Timeworks DTP cannot take full advantage of such a printer. Where PostScript rescales one font to give an unlimited range of sizes, GDOS requires a different sized font for every point size used. This soon leads to memory shortages in the computer - even on a Mega ST.

Publishing Partner does not run under GDOS, working in a similar way to PostScript by rescaling fonts to any desired size. However, to access the extra fonts in the printer, we've had to design our own screen fonts - a very laborious procedure. These screen fonts are available (for a reasonable price!) to anyone who wants them. We can also offer a PostScript laser-printing service - something I don't think anyone else is offering for the ST.

Ventura Publisher - acknowledged as today's top DTP program - runs under a modified version of GEM on PC compatibles. GEM2 on PCs now comes with rescaleable Bitstream fonts. Are we ST users being left behind? Does Timeworks DTP on the PC have the same limited range of fonts and sizes as on the ST?

Barry Parkinson, Parkinson Computer Graphics, Barrow-in-Furness, Cumbria.

PostScript Solutions

In response to Ian Tindale's contribution in I/O 30:36, I would like to correct the impression he gave about the ST and PostScript fonts. It all depends on which DTP package you are using.

The thing to remember is that the 'business end' of a PostScript font is in the output device. Essentially, all the DTP program has to do is write a PostScript instruction to the output device's RIP (raster image processor) to use (or download and use) the appropriate font.

All PostScript laser printers come with Times, Helvetica, and Courier as standard. Many have other faces, such as, Century Schoolbook, Palatino, Bookman, Chancery, and Avant Garde as well. Furthermore, there are now a large number of PostScript faces which can be downloaded from disk into the printer or typesetter.

There is actually one other very important thing which the DTP program has to do. It must know the widths of the letters of a particular font, otherwise it won't be able to make the line breaks in the same places as the printer. Each PostScript face comes with a 'width table', giving the widths of each letter in each size and style.

As far as ST programs are concerned, I believe that Publishing Partner is only able to use Times, Helvetica, and Courier. Timeworks DTP can use all the fonts mentioned above (provided you answer correctly when running FONTWID.APP), but cannot cope with any others because there is no way to install new width tables.

Fleet Street Publisher is, as usual, the most flexible. One bureau has 199 fonts (about 50 different type faces) on offer. This is possible because the width table supplied with the downloadable PostScript font can be converted for use with FSP.

The last problem is that you will not usually have a proper screen representation of your chosen font. Fontz! might help you here, since it could be used to convert the appropriate Macintosh screen fonts. Alternatively, you can design your own GEM fonts, or simply use Swiss or Dutch to stand for serif or sans serif fonts as appropriate.

It may be true, as Ian claims, that "nobody really understands GDOS", but I don't think that things are as bad as he suggests. People are working on new GDOS fonts - only today I received an advance copy of a very good Century Old Style (screen and Atari laser), complete with a true italic (slanting a Roman face does not make it italic!).

It is, however, true that there are copyright problems on fonts and these will need to be resolved somehow. Incidentally, the Dutch and Swiss supplied with GDOS applications are not public domain - they are copyright fonts. The purchaser has the rights to use them, but not to sell or otherwise pass them on to a third party (at least, that's my understanding of the position).

Richard Seel, Ealing.

New discussions

Mixed media

1 Has anyone come across a product about which I have heard rumours, which will go through a laser and can be used directly as a limited run offset plate?
2 Anyone know of a source of supply for the transfer paper which will go through a dot-matrix and the result ironed onto a T-shirt? Can anyone suggest a commercial method of transferring designs from the ST to T-shirts?

3 Has anyone experience of using continuous paper through laser printers? Has anyone experience of the fact that the paper does not run at a constant speed through most lasers, i.e. it accelerates? This is only a small effect, but does become important if you need to take accurate measurements from the output.

4 Does anyone have the totally definitive answers to problems associated with reading disquettes (that avoids any controversy) (vehrie phunney - Sysop) from XTs and ATs and vice versa? My only reliable solution seems to be to format a 3.5" disquette as 360K under MS-DOS, format a 5.25" disquette as 360K under MS-DOS, save the 1st Word Plus files onto the 3.5", then copy it to the 5.25" under MS-DOS. The result can then be read on most XTs. There must be an easier way. It may be my 40 / 80 track drive, but I have done many hours of experimentation. 1.2MB drives on ATs seem to be a little more tolerant of my efforts.

5 Anyone have any suggestions as to how to fool 1st Word Plus into accepting files with characters below 32 ASCII? Because of Plus's indigestion, I have had to resort to 1st Word on occasions, as it is much more tolerant of which files it will read.

Here is a tip, too: A product called Transtext allows you to make car window stickers, etc. It is a clear film with a paper backing that will go through a printer or a photocopier, although it tends to jam in the Atari Laser. Currently there is the Harrier from Fleet Street embellishing the window of my study.

Charles Quekett, Clunderwen, Dyfed.

Heathen names?

In your July 88 I/O column, you asked contributors to send in their "Christian names... to make things a little more friendly". This was rather unfriendly, not to say insulting, to the non-Christians among us. What you really meant was first, or fore-names, yes?

Philip Taylor, Glasgow.

Yes, you're correct, but if you think that's going to get your letter printed in I/O, you're mistaken! Ian.

BBC Drive on ST?

Is it possible to use a BBC-compatible 5.25" disk drive with a suitable cable as a second drive on the ST? Also, is there an ST user group in Manchester?

Richard Hanby, Chorlton, Manchester.

Partitioning an NEC HD

Firstly, thanks to Phil Randal of Cornwall for his drive B: software boot patch, which works a treat on my system at home. My problem, however, concerns the system I use at work. This consists of a 520ST (one of the very first versions available), a 0.5MB drive A and a 20MB hard disk drive C.

The hard disk was manufactured by NEC and supplied to us by a third party hardware dealer. Although the disk works OK, it would be very helpful if I could partition it into a number of logical drives. I've tried a number of hard disk utility programs without success, and I wondered if anyone has (or knows of) a suite of utilities which will talk to this make of drive? I would also welcome any comments from hard disk users in the educational field. If anyone would like to contact me by phone, my daytime number is 0602 418248 ext. 2685.

Mr Pat Hamilton, Trent Polytechnic Dept. of Computing, Nottingham.

CD-ROMs - you missed the boat 1

Ian Tindale in his article on CD-ROM says that the ST is probably the most sensible choice for a business or professional computer in the late '80s. That's what they said two years ago. Now Atari themselves produce IBM-compatible computers, and the ST is seen as a games machine. This CD-ROM is clearly neither fish nor fowl and attaches to the ST. *The* most sensible entry into the world of CD-ROM? We've been here before, Ian!

John Unconvinced (J R Sampson), Stockport, Cheshire.

CD-ROMs - you missed the boat 2

Proven technology? Very funny. About a month ago, there was an article about CDs in New Science magazine. It appears that people who had bought CD's some time ago were now complaining about sound loss. Investigations, testing, artificial aging, etc, guess what, the little things aren't stable! The aluminium oxidizes! That's right, it rusts. No-one ever thought that this would happen. Pick up any CD, hold it to a very strong light, and you will see pinholes of light shining through. Those holes spread. The Japanese figure that CDs have a shelf life anywhere from 18 months to 5 years. Afterwards you can use them to play frisbee with the cat (no, cats are the wrong shape - Sysop).

New test CDs are being made: pure gold. At least that doesn't rust. As for the CDs already existent... the cats will have a great time.

What goes on the things? At the moment, junk. Pictorial encyclopedias are worthless, as is a street map of the UK, etc. Only when major, useful things like the Encyclopedia Britannica or the Oxford English Dictionary are on CD will it be worthwhile. Yet there is a problem. These publishers are not about to place their material on a medium which can be copied, not only by kids, but by those countries which don't respect the copyright conventions. The OED for £2?

Okay, let's stick to existing software. A CD can hold about 45000 programs (the PC CD does). Let's calculate what this little frisbee is going to cost: Signum, Superbase, etc, all on one disk, at £50 EACH (it's a packaged deal)... whoops, my calculator ran out of zeros. Is that right? £250000000? Let's sell Signum for £10... It still runs up to £450000. Even if we just pay the royalty fees, that disk is

still going to cost more than a racing yacht (and I would rather have that than a frisbee). Guess why this whole issue, with such wonderful potential, is ignored? Unstable medium, no reasonable copy protection, and a huge royalties problem. That's the end of the frisbees.

Andreas Ramos, Aarhus C / Denmark.

Atari laser tip

SLM 804 owners may be interested in a useful tip which can be an absolute saviour when your toner cartridge runs dry. This does not happen suddenly, although if you make heavy use of the printer, it can be disruptive to run out. The trick is to simply pour the expended toner from the translucent plastic reservoir back into the toner hopper. The used toner should be in pretty good condition and will run through the mechanism a second time without any problems. If things get really tough, you can perform this operation several times over, thus extending the life of the toner kit by a substantial degree.

Although I have tested this and have had no problems whatsoever, it must be said that it is not a recommended practice. Also, don't be tempted to use photocopier toner - it is a different substance and will clog up the Atari laser printer.

Finally, do any other SLM804 users find that the 'Low Toner' warning light comes on when the hopper is clearly more than half full of powder? Is there a cure?

David Stewart, ST World.

Fussy disk drives

I have a puzzling problem with the floppy disk drives which I hope you might be able to enlighten me.

My setup consists of a 520STFM (TOS 1.09) and two AT&T external disk drives connected (Citizen mechanism), the internal drive is, of course, unconnected. This works very well unless I try to use the *Maxell MF2-HD* (high density 1.6, 2MB type) double sided disk. It would not even format the disk, returning an error code (data on drive A or B might be damaged, you must use the right kind etc...).

Sometimes the formatting process went through until the end when the same message is displayed. This is also happening when trying to read or format a disk under PC DITTO in IBM format, the error is then track 0 unusable, etc. The puzzling problem is that all of these disks format and works perfectly well with all of the numerous office PCs. (Toshiba 3200 (internal 720K disk), Olivetti M240 fitted with 3rd party 3.5" disk (720K Citizen drive) etc. and of course the IBM PS2). I have also tried formatting a disk in the office PC and then tried to read it under both ST GEM and PC DITTO to no avail, all these operations still work perfectly well if a normal disk (i.e. Sony, JVC, Parrot, etc.) disk is used.

To summarise, everything worked well with normal DSDD disks and nothing worked with the Maxell on the ST but the so-called 'old technology' PC will quietly accept it all (in some case using the same drive mechanism.

T.Q. Tran, London SW19.

DIY hard disk

I recently re-read in issue 20 an article describing a DIY hard disk drive for the Atari ST. I cannot find any further follow-up information on this, and would appreciate details on the following queries:

1 Has anyone followed the instructions and built their own hard disk unit?

2 Is it still financially worthwhile (circa £300)?

3 Are the boards still mail order from the USA (or has some enterprising person made them available in the UK)?

4 Do any real problems exist - techical, operational, warranties, etc.?

5 Is this a pointless excercise as hard disk prices are set to be reduced in the near future?

Alex Pidd, Selby, Yorkshire.

Classical Greek fonts

Before I decide to abandon 1st Word Plus + Epson LX-80, I am writing to enquire whether anyone can advise me as to ways of accessing a 'user friendly' Classical Greek font using the above-mentioned package, operating on STM2.

I have been advised that my only choice is to purchase **a)** Signum 2, **b)** 2 specially designed Signum compatible Classical Greek fonts (over £200 so far), and a 24 pin printer (+, essential to me, a compatible cut-sheet feeder), all of which will add up to about £1000!

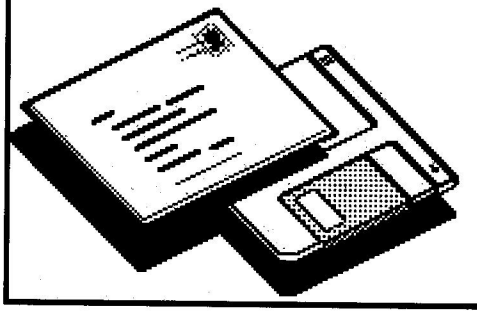
This seems rather a lot of money to spend in order to obtain a Classical Greek Alphabet. Better/cheaper suggestions would be extremely welcome.

J. A. Harris, London, NW5.

PRIZES! PRIZES! PRIZES!

The three prizes this month are awarded to: Charles Quekett, Clive Parker, and Andreas Ramos. The prizes are awarded with no rules, guidelines or parameters, purely and simply being based on which three letters I happen to like each month. More I/O next month. - Ian Tindale.

ST WORLD I/O



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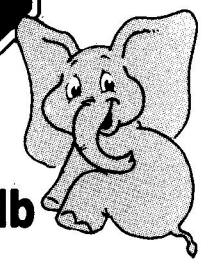

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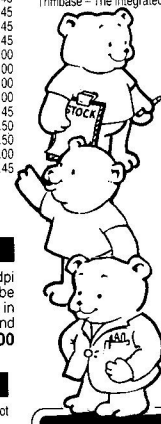

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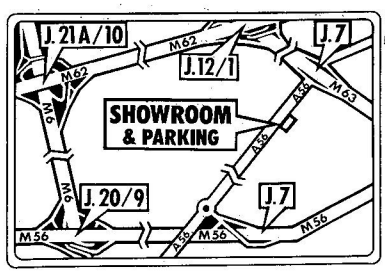

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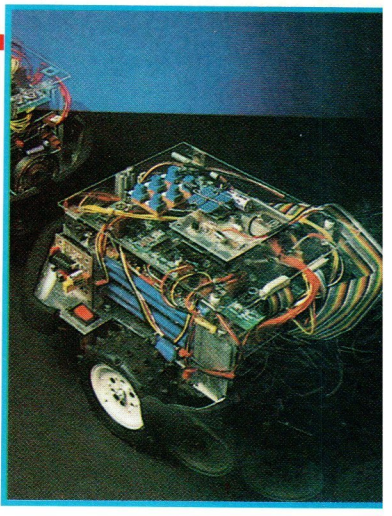


At this year's PC show, Atari announced the launch of their new Atari Robokit - a package allowing the ST owner to build and control sophisticated robots. Atari Robokit was developed from a larger industrial product, Robokit Professional. *Ian Tindale* investigates Personal Robots Ltd, the company behind both products, and finds that there is more to Robokit than just Lego.

Robots and computers have long been linked together in the minds of the general public. Early fictional stories and films, even folklore throughout history, seemed fascinated by the idea of man creating something not unlike man. Today, with films such as 'Robocop', featuring a rebuilt American policeman apparently running under MS-DOS, the image continues to be perpetuated more than ever. In actual fact, however, real robots do exist - in, for example, car assembly or bomb-disposal - and are taken very seriously in industry and education. At this year's PC show, Atari released their new Atari Robokit, which allows an ST to control real physical robots. We take a look at the company behind the development of Atari Robokit.

The background

Personal Robots Ltd, situated in Henley-on-Thames, was founded by Julian Allason and Richard Pawson in December 1984. Originally a research partnership between the two, they took on employees, formed it into a limited company, and acquired venture capital backing. Julian is now the chairman, Richard is the managing director. Richard and Julian, however, go back together in previous ventures, especially in the field of computer publishing.

Richard left school and got a job with Commodore in the service department "...a fairly enormous department, on account of poor reliability." During that time, January to August '77, the Pet was announced. "I got to see the very first Pet! I met Chuck Peddle and Leonard Tramiel. Because no-one else in the UK knew anything about the Pet, all the questions were directed at me, even though the Pet didn't go on sale until Spring of '78."

"They had announced some publication called the Pet Users Club, quite unique in those days. Although there were independent clubs they were not official, but the Commodore one was. I was given the job of editing that for its first year, from university - I spent no time working on my academic course!"

Microcomputer printout

After Commodore had recruited Richard to work in Switzerland as European software manager, Julian asked him to help launch Microcomputer Printout as a general news-stand computer magazine. A year later Microcomputer Printout was subsequently sold, Richard then edited the Home Computer Course: "...it was tremendous kudos to be offered that; it was a huge publication. They sold a quarter of a million copies of every issue in the UK. I only did the first 24 issues. By the time that had finished, I'd had enough of writing about computing."

Meanwhile, Julian Allason had founded PetSoft, one of the first software

DAVID STEWART

Richard Pawson, Managing Director of Personal Robots Ltd, with a prototype interface board from the Atari Robokit.

publishing companies. "Even Julian would admit some of the stuff was pretty ropey, nevertheless it triggered the whole idea of independent software publishing. I met Julian because he advertised in the Pet Users Club. I asked Julian if he thought there was a market for an independent Commodore magazine in Britain." Thus Microcomputer Printout was born. Julian published it and Richard edited it. The first two years it was exclusively about Commodore microcomputers.

In the beginning of 1984 Richard became very interested in bio-technology: "...but having given up biology at the age of 13 I discovered I didn't know enough to do anything worthwhile about it. Then I cottoned on to robotics, discovering that there are a lot of people doing a lot of interesting things on the quiet, in robotics, in universities around the world."

There were then one or two abortive attempts to get personal robots onto the market - you may recall Nolan Bushnell and his company, Axlon. Richard observes their current position: "They're not getting on terribly well, Nolan has brilliant product ideas, but is not a great businessman and what he's doing now is primarily designing for others. Axlon itself doesn't really have a sales operation anymore. Nolan would dearly love to get back into robotics, I think, that's where his heart is."

The competition

Many would consider Personal Robots as being in competition with Axlon. Richard disagrees: "That would have been true, but it's not now. Three years ago, it looked like what he was doing and what we were going to do was identical. We only have one competitor in the world now, and we're on extremely good terms with them - we exchange ideas - and that's a company called TRC, in the States. Interestingly enough, TRC is run by Joseph Engelberger - he founded the industrial robot concept in 1957, in the form of the Unimate robot arm."

"Personal Robots is committed to robots in the service industry - as are TRC in fact. This implies that they are not concerned with robots in manufacturing, concentrating instead in: security; hotels; leisure; medical; entertainment; all kinds of applications - or there will be! In particular, we're both working a great deal on navigation systems for interior robots. I think that that's an area in which we're somewhat ahead of TRC, although Engelberger wouldn't like to think so."

Richard Pawson is also the author of 'The Robot Book', published by W.H Smith. All about robots, from history to current applications, the second half of the book tells you how to build your own robots using Fischer-Technik and Lego. "That was where I got the idea. I also discovered Julian was getting interested in robots. I completed The Robot Book in October '84 and it never saw the light of day until about June '85, although it's still reasonably up to date."

Personal Robots begins

None of the staff of Personal Robots have backgrounds in robotics. There simply was no such thing as robotics when Personal Robots were looking for recruits. Pawson recalls: "This was certainly true four years ago, you couldn't graduate in it, except in some very mickey-mouse aspects of robotics, like cybernetics, which is all very dodgy stuff. Robotics is simply the combination of a number of other disciplines: electronics; mechanics; software; AI; mathematics and engineering."

Personal Robots hit upon the idea of a standard 'operating system', where everything they did would primarily add to a modular robot technology - i.e. motors, sensors, software etc. "...So the further we went on, if we came up against an application, we should be able to take 80% of what's required off our own shelves, and add on 20% worth of glue, and hopefully half of that 20% would create a new module for something else. That was where the thinking came from. We had to come up with a product using this technology, the first was one called Robokit."

"This was 1985, Robokit was a children's construction set for the 1990's, specifically geared to building robots. The mechanical things would fit together in a way that related to robots - limbs and elbow-joints and so on - and all the software would make it transparent. If you plug in a touch sensor, which is just a plug-in module, it would mechanically hold on, would make the electrical

Richard Pawson: ***"Personal Robots is committed to robots in the service industry - security, hotels, leisure, medical, entertainment - all kinds of applications... ... Robotics is simply the combination of a number of other disciplines: electronics, mechanics, software, AI, mathematics and engineering."***

Top Right: Two prototypes of the Atari Robokit interface board. One is plugged into the ST's cartridge port via a ribbon extender, the current boards plug directly into the socket - see foreground. The prototyping matrix area has been lost in the evolutionary process in the final model.

Centre Right: An example of a simple robotic application using technical Lego.

Scamp - which many of you may have seen demonstrated by Richard Pawson on 'Wogan'. Scamp is completely self contained, with its own personality model which implements different emotional demands.

connection, and automatically the appropriate software would be linked up. A brilliant idea but too clever by three-quarters. It was too far ahead of its time, and also, too expensive to develop."

They were unsuccessful in selling this to the American toy industry. "It was right at the height of the Cabbage-Patch Kids phenomenon, and we went there saying 'this could be as big as Lego', and these Americans who invented Cabbage-Patch dolls were saying 'Gee, this could be as small as Lego!'"

Scamp

Personal Robots put their modular technology theory to the test, knowing they should be able to come up with another application quickly. They developed 'Scamp', a radical idea, still way ahead of its time. Richard has appeared on Wogan with it. Scamp is a robot pet - the shape of a small cat or teddy bear, about the size of a fox-terrier - and covered in green fur, with a friendly face. Scamp has sophisticated animation, multiple internal servos, a number of sensors: sound; light; touch and others. The genuine working model is completely self-contained, crammed full of electronics with 4 PCBs inside it, 13 batteries and about 48K of optimised C and machine code software.

Pawson elaborates: "The interesting thing was, it contained its own personality. It has a very sophisticated model of personality which I think would have high credibility amongst the psychological community. It models different emotions or demands: affection, boredom, contentment, curiosity, fatigue, fear, irritation, playfulness, loneliness, sadness, sleepiness. These factors are continuously changing, and everything that happens to Scamp will have a linear effect on one or more of those levels. Everything that Scamp does has an effect on one or more of these emotions at regular intervals - a heartbeat, as it is called. It actually operates in a very similar fashion to the hypothalamus, in the brain. This controls the four 'F's of survival, which are: feeding; fighting; fleeing, and sexual reproduction."

Animator

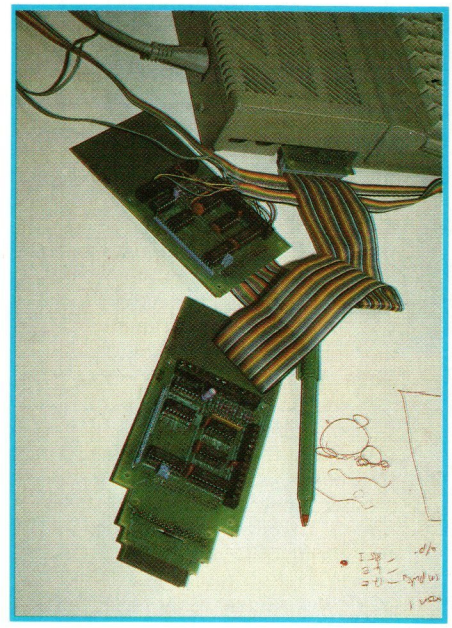
Scamp's movements are created using a system called Animator, written by Personal Robots. Atari Robokit is the first of five products for the ST; the Animator package will be a later addition to the range. As for Scamp's personality software, Richard was not sure whether they would decide to release it in any form at present.

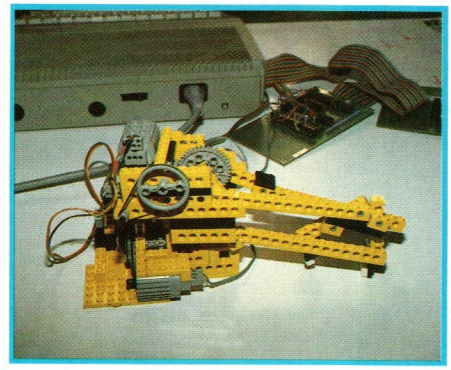
"Animator creates high-quality animation in physical devices, not high-quality screen animation. You can build a robot out of Lego, or Futaba servo's. You can control that from Robokit, but if you want to create some clever animation for creating gestures, like we did with Scamp, then Animator is the package that will do that. It works like a multi-track tape recorder."

The Atari Robokit

Atari Robokit works on all ST machines. It consists of: a software package; a manual which includes instructions on how to build Lego robots; plus an interface board for the ST. No Fischer-Technik or Lego is included. Richard explains: "No, you're expected to either have or to buy them separately. Lego is better than Fischer-Technik now that Lego has brought out these shaft encoders and microswitches. It's streets ahead of Fischer-Technik. Lego is the system to use. The Lego Control Set, which is not available in shops, but available for schools, is ideally suited to working with Robokit. It's about £75, and contains two motors, two shaft encoders, a whole pile of technical Lego."

The Atari Robokit board has the facility to drive four DC motors, not necessarily





Lego motors, bi-directionally, or eight uni-directionally. The board can drive up to 3 amps, so solenoids could even be used. There is no software support for stepper motors, preferring to adopt the cheaper and more flexible DC motor plus shaft-encoder principle. There are also up to eight outputs to drive Futaba servo motors. The inputs can be TTL inputs or switch closures. Included is the ability to drive two of the new Lego shaft-encoders.

Theoretically, Robokit could be built into anything, not necessarily just the arms and grippers which first come to mind. "It's particularly geared towards autonomous mobile devices, it's not that well geared towards arms and grippers. If we were primarily going for arms and grippers we could have put other functions in there to do with geometrical

transformations. What we hope is that people will add to it, creating new applications for it."

The first Atari product available is Atari Robokit itself, available very soon now. The next product in that range will be the Neural Net compiler, due for release around the end of 1988 / early '89. After that will follow a series of other innovative ideas for Atari Robokit, including the Animator application, and Slotwriter. The latter permits you to create your own slots, which are a unique Robokit control concept. The Atari Robokit as standard comes supplied with a very large number of standard slots. Slotwriter will allow you to write your own slots in an ultra-high-level language, based on finite state machines.

Lots of slots

A slot is a piece of software that responds to a particular set of messages. For example, if the slot controlled a motor, it might be 'start the motor moving at this speed'; another might be 'stop the motor'. Each slot may be thought of as a message processor. It may send on different messages elsewhere in response. Generally a slot is very simple.

Pawson explains how Neural Net theory fits into the slot concept: "The Neural Network is configured as one of those slots, running in parallel with the other slots. You can draw a Degas or Neochrome picture of your neural network, pull it up into a window in Robokit, and, in effect, say 'assign the current state of this neuron, which is either off or on, to coordinates X,Y in the window, so you can actually see the neurons firing, which ordinarily is no use to you at all, but if you then slow the system clock right down, which is something you've got as a standard Robokit facility, you can actually debug your neural network."

Robokit Professional will be selling for about £2000. Atari Robokit is simply a subset of that, and will probably cost £75. Could Atari Robokit not have been developed on its own as a package? "...No way we could put that much programming effort into something which sells for £75, including the hardware. It's only because it's been paid for by project after project."

Neural Net

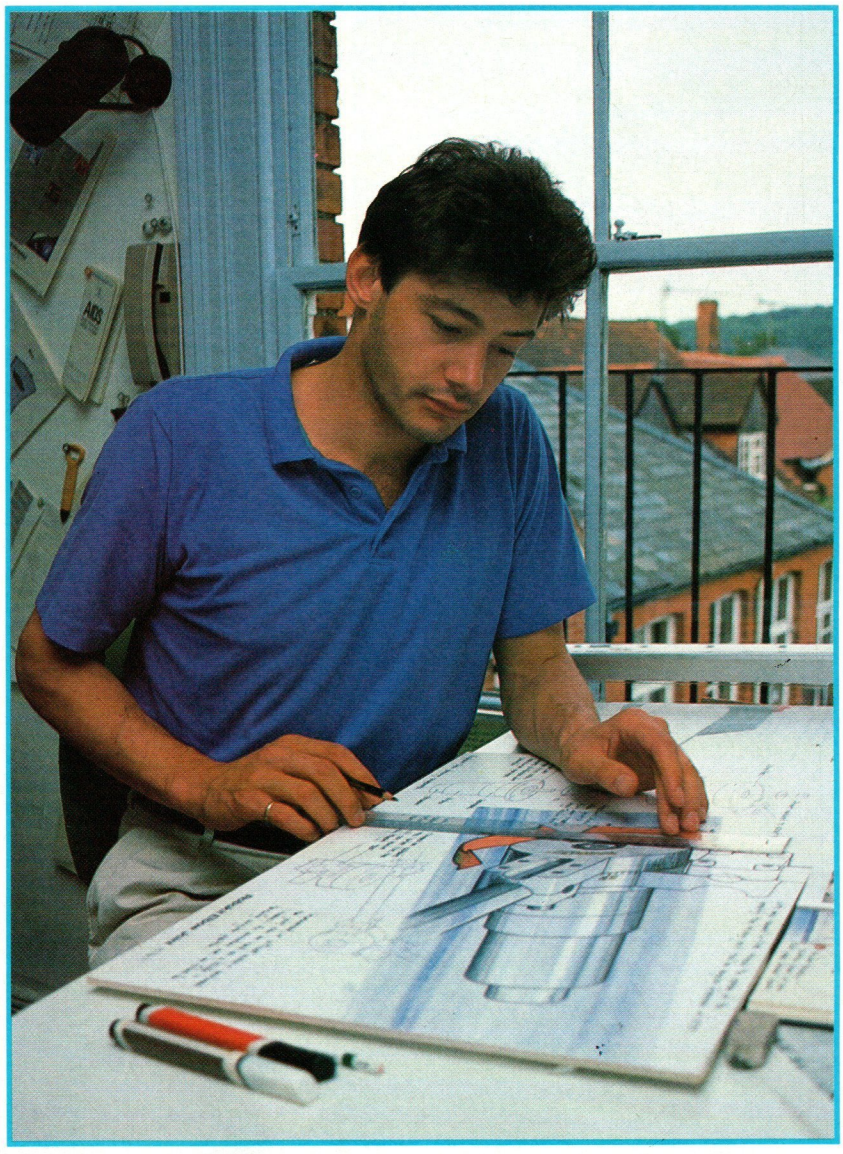
Neural net is one of Richard Pawson's pet subjects. A Neural Net is a simulation of the way in which human and animal brains work. Human brains are constructed from neurons, or neural cells, and a neural network is an emulation of a network of those cells. Out of that you get some quite extraordinary behaviour, even though you may only have ten or so neurons in the network.

"Some people use the term synonymously with massive parallel processing. That's not a good analogy, a neural network is a very specific implementation of parallel processing. In a neural net, neurons interconnect in a network. All inputs come into a neuron, and are either excitory or inhibitory. In other words, they either add to the state of the neuron or they detract from it. Each neuron is given a threshold, and if the number of excitory inputs minus the number of inhibitory inputs exceeds the threshold, then it will execute an output pulse. You can use that technique for creating behavioural routines."

The people

Personal Robots, from initial impressions, appears very strong in industrial design, with plenty of very professional visuals and graphic representations of current and future products on walls, etc. "That's intentional, in fact Doug Cunningham - our industrial designer - was our first employee. That's for two reasons: firstly, we were committed to designing mass market products - we're not interested in designing one-off solutions for people, and therefore it's important to have a technical understanding of industrial design; and secondly, because a lot of what we'd be selling to other people would be at concept stage, it was vital that we had really superb visualisation capability, and Doug again does all that."

Doug Cunningham is responsible for some truly amazing and dynamic graphics, as well as working visuals for design purposes. As an industrial designer, Doug has

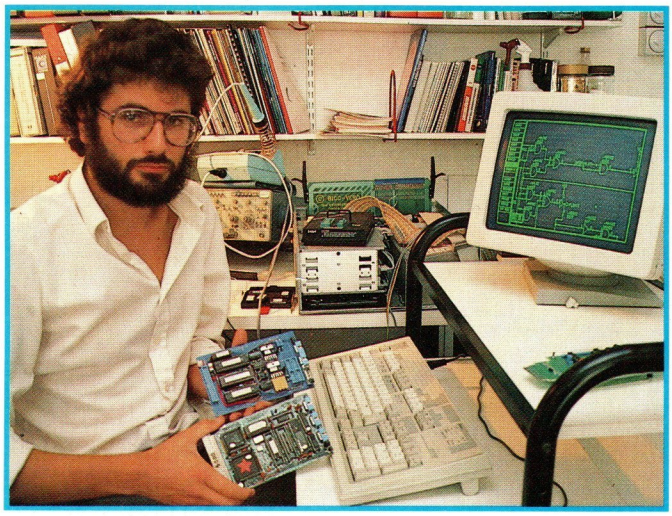


Doug Cunningham, Personal Robots' industrial designer, plays an important role in the development and marketing of new robotics concepts.

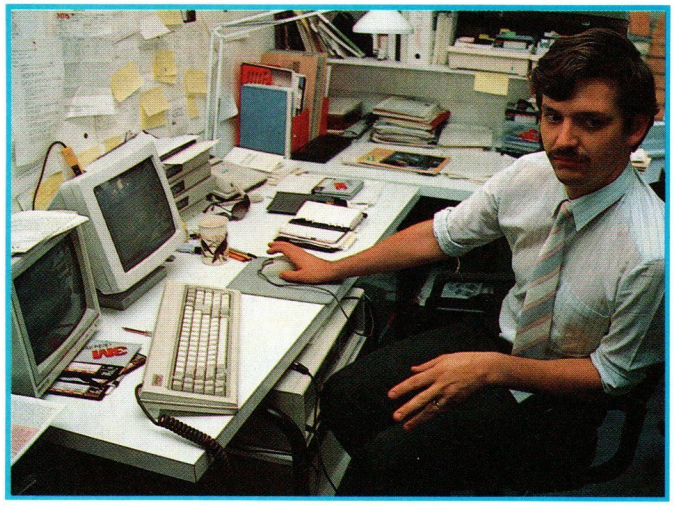
Gary Lawman working with two driver boards and a neural net simulation on screen.

to have familiarity with all materials and processes involved.

The Personal Robots team seem really impressed with the ST. They find it a very nice system, offering outstanding value. They have discovered it's not well suited for live control, although Robokit attempts to correct that. They love GEM, and because of the need to develop applications on the ST, some of them are using it as a general development system, even on non-Atari-related projects. Generally, the ST has great credibility within the organisation.



Richard Beer developing Robokit Professional's 'System Builder' software.



The electronics lab is staffed by Gary Lawman, James Foley and Chris Colborne. Gary is in charge of electronics, presently working on models of Perceptrons - a very interesting toy presently under development. The Neural Nets are at the moment simulated in software, but by the time it goes into production it will be implemented on a specific gate-array chip. James was working on a standard way of controlling DC servo motors, and Chris was tied up building an automatic test-unit for slave boards.

In the software development department work Richards Hodson and Richard Beer. Richard Hodson is at present full-time at university. He was working on the Neural Net at the time, and is a big fan of the ST: "I like the ST, while I was here before, I was programming PC's and I just hate the 80286. Using the 68000 and GEMDOS, you just say 'I want 500K' and it just gives you it. I now find going back to PC's impossible, the ST has programming friendliness."

Richard Beer was working on 'the ultimate of the Robokit tools', which will not appear on the Atari Robokit. Called 'System Builder', it allows you to create multi-board, multi-processor development applications without needing to know about the programming process. Each Robokit Professional system is made up of modules, each module could represent a different processor board which will appear as different types of icons. You can select one and look at the different slots and edit its characteristics, totally defining your own custom system.

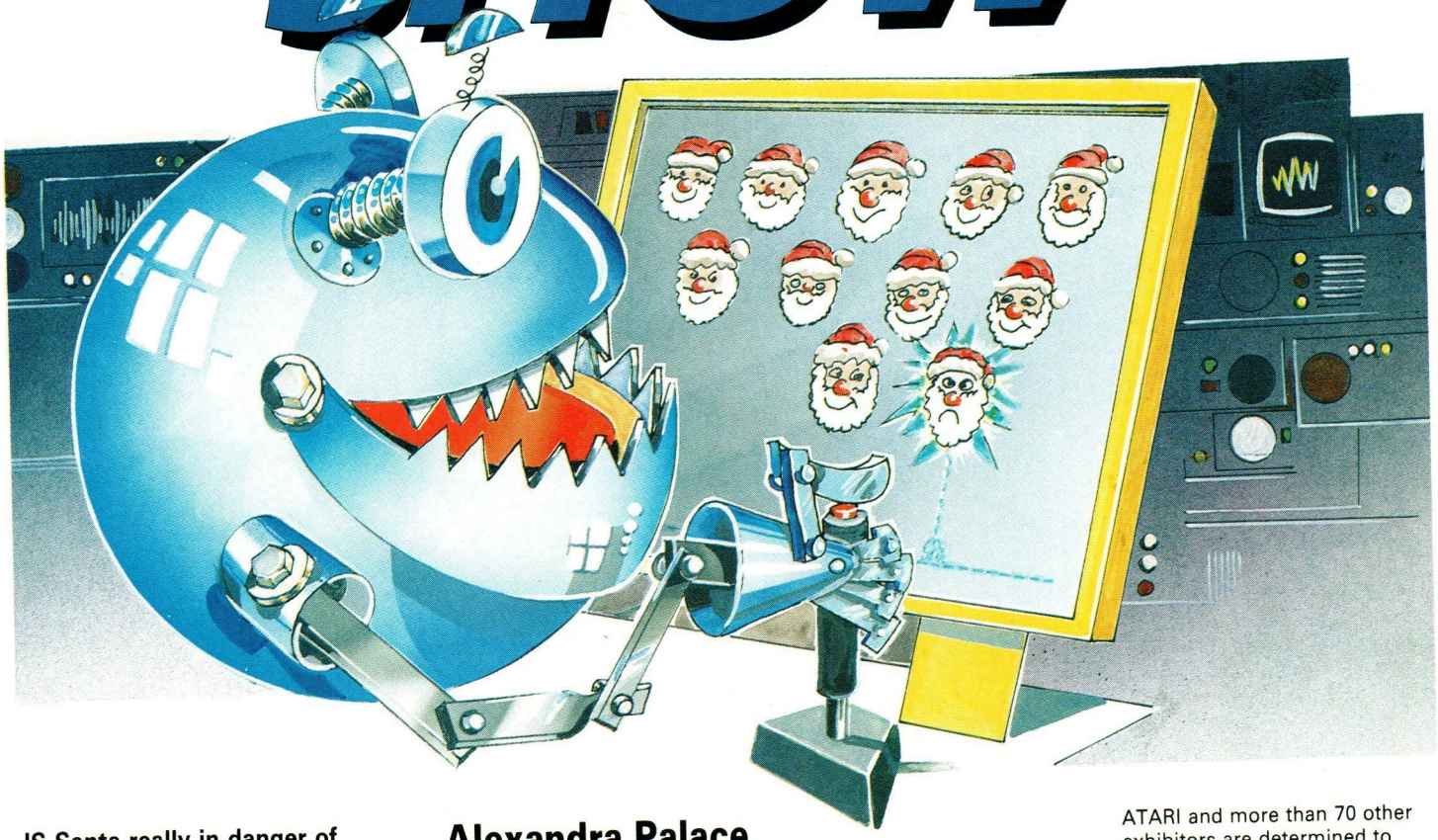
Actual robots

Personal Robots are working on an interesting toy employing Neural net technology. Called 'Perceptrons', these battling robots behave with an independent animal-like quality. They joust and dogfight, sensing and shooting each other with infra-red. The users only control over them is via a bank of potentiometers. After each round, which lasts only a minute, you 'spec' the robot, as in a fantasy game. You can have any number of Perceptrons in battle against each other. Personal Robots hope they will retail around US$100 per pair.

There were some interesting robots able to be demonstrated. First, the security robot, which is under development. It was unable to do anything useful except perambulate about - as it was being currently worked upon, many of its facilities were not functionally implemented. It certainly is impressive, nevertheless. Personal Robots are working on robot vision -

Richard Pawson explains the Perceptron concept - battling robots presently under development, using neural net technology to intelligently fight with each other in short rounds.

ATARI CHRISTMAS SHOW



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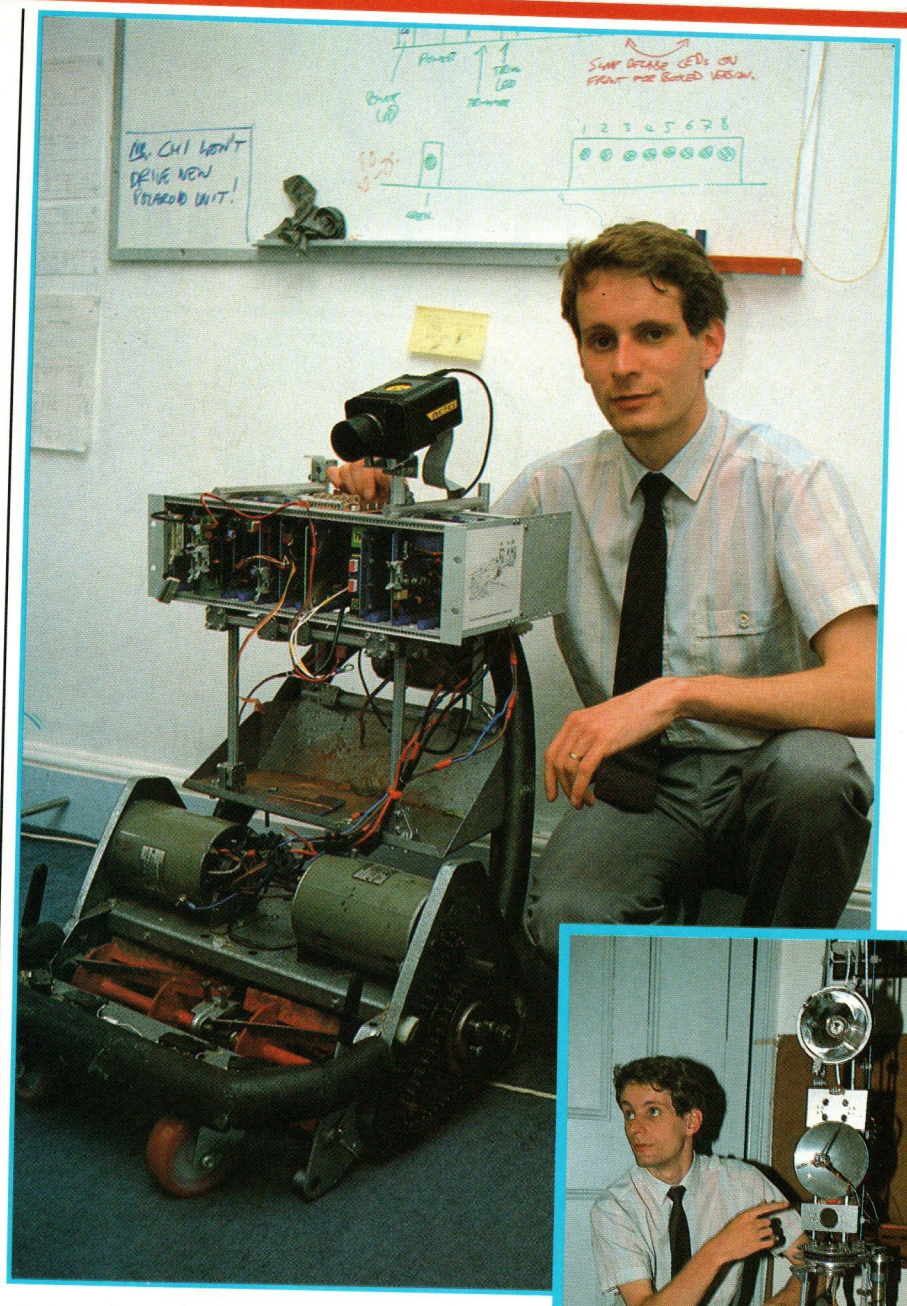
and for sensing obstacles and walls, infra-red and ultra-sonic range-finders are employed, in keeping with the aim of using low-cost sensors.

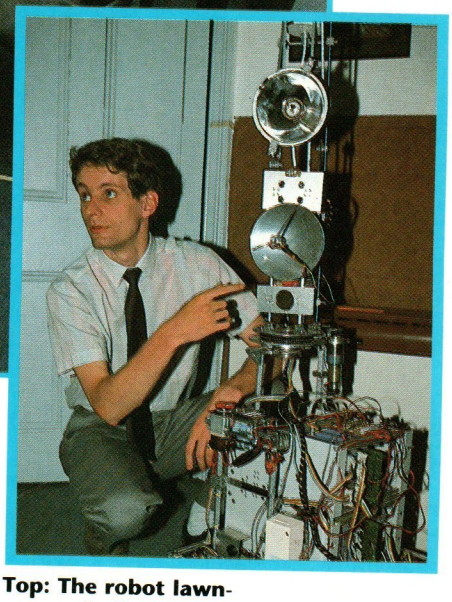
The basic Robokit technology can be demonstrated as shows, etc. using PRL's special purpose three-axis demonstrator which is basically a frame, and a manipulator which can grip and position an object within the three-dimensional interior of the frame.

A very interesting object was wheeled out from one corner - a robot lawn-mower under development (which was not demonstrated!). Grass shavings in abundance suggested it had been recently tested. Richard Pawson added that his wife had banned it from being tested in their garden ever since it attacked their petunias! It also appeared on Tomorrow's World, nearly cutting off the presenter's foot. Richard continues: "...but that was their fault, we told them it wasn't operational, they insisted on trying it." All these three robots were substantially constructed from Robokit Professional.

The future

Atari Robokit is due out now, followed by the Neural Net compiler, then Animator, then Slotwriter. What's next? Richard Pawson suggests: "Atari are very keen for us to have an Abaq and to create some of our software for the Abaq. Everybody thinks Abaq and thinks graphics, but processing power is used for more than just that, although a lot of the world doesn't seem to realise it. It's very useful for robotics, where some of the applications involve some fairly heavy mathematical transformations. Forget graphics, just think vision processing. We're certainly starting to build transputer boards now." END





Top: The robot lawn-mower built using Robokit Professional.

Above: The security robot currently under development by Personal Robots.

ST UK

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Single Sided Disks

Application Disks

AP5 : Titles - Archiver II file/disk compacter version 1.0 excellent, Laser base utilities, Autodate and clues for adventures and tips on using the ST and Flash.
AP6 : 10 Titles - Autogem - this is brilliant tested with Degas Elite, Publishing Partner, 1st Word Plus and Trimbase, it auto boots any GEM program on booting the ST - brilliant!, Xformat2 - Extended disk formatter, Shorttermcomms, VC spreadsheet -non GEM spread sheet, Directory lister, System font changer - uses Degas format fonts, Reminder - appointment reminder, Print Master to Degas, Snatch2 screen saver.
AP13 : Publishing Partner disk 1. Public domain fonts for non postscript printers. Hudson, Columbia, Devoll, Thames, Spokane and Saturn. There are colour and monochrome screen drivers and printer drivers. Font editor - create your own fonts, very complex. Also on this disk is a printer driver for the HP Laserjet Plus printer. All the fonts on this disk work with the HP Laserjet Plus printer.
AP24 : Astrolab German astromony program. Monochrome only, 1Mb Ram and a 500k RAM disk are needed.
AP29 : 6 Titles - Skymap monochrome only star system - 1500 stars are included excellent astronomy program, . Conterm - version 4.2 comms package - on line help, function key editor GEM based.Very good directory printer lister.
AP30:7 Titles - DEC edt clone for the ST (editor), Disk engineer version 3.01, allows you to do anything to any disk Is GEM based can give you a complete report on any disks, format, copy, listings and FAT info. Includes source code. 8-bit to Degas converter, MAC picture tranfer program.Unencode, and Shar/UNShar.
AP31: 40 1st Word printer drivers - all Epsons, Panasonic, Atari and Atari Laser, NEC Pinwriter, Star, Olympia, Toshiba etc.
AP35 : 3 titles - Compunet fully working supplied by Compunet themselves, version 1.00 documentation on how to get started. Plus ProEd. Excellent text editor that is non GEM - very good. Home accounts - Payschedual, Accounts (ST Basic program and manual), Loancalc (ST Basic program).
AP36 : Clip Art 1, dozens of monochrome pictures and clip art suitable for any package that uses Degas or Tiny format pictures.
AP37 : Clip Art 2, dozens of monochrome pictures and clip art suitable for any package that uses Degas or Tiny format pictures.
AP38 : Publishing Partner disk 2. Six new fonts for non-postscript printers - colour and monochrome screen fonts and docs to tell you how to access the foreign characters of the ST. There is also a much needed update to the Helvetica font. The 6 new fonts are Caligrify, Elegance, Courier, Roman Bookface, Westside and Avant Garde.
AP40 : 6 titles - Harddisk 1. Disk full of hard disk programs - including Turtle version 2.8.
AP41 : 8 titles - Monochrome emulator version 3. This program makes your ST think that it is running in monochrome mode when it's using your TV or colour monitor. Works on 520's, 1040's, new and old TOS, and tested with dozens of programs - includes the source code in 'C'. CMFonts converts Macintosh fonts to ST GDOS format. The programmer claims to have tested the results with Calligrapher includes Source 'C' code - sounds good. Topchart, Setdate. Apricot textfile converter and source code. INPUT a small program to enter small text files to disk or printer. Deformattor - this program deformats your disks! A program that claims to be a Virus killer and disk immuniser.
AP44 : 6 titles - STar Net Bulletin Board System a very good BBS system. Clocks, countit, Micro Emacs to EDST file converter, Seek Speed - diskseek speed changer can help with IBM drives, Virus killer version 2.
AP50 : Beginner disk 250k text file for people who are new to the ST or are having problems with aspects of the machine i.e. RAM disks, spoolers, Desktop Accessories etc.
AP51 : 12 communication packages and utilities etc. all ARChived to fit onto a single disk. Disk contains ARChiver II and help doc.
AP52 : Hard disks disk 2. Eight hard disk utilities.

Desktop Accessory Disks

DA1 :14 Titles - Calendar, Crab, Index printers, Intasect RAM disk excellent, RAMdisks, Lupe, Reversi, Sideclick, Spooler, Texas instruments calculator, Tiny tool editor, Analogue clock, Breakout.
DA2 : 29 Titles - 5 Calculators, Calendar, Font loader, Digital watch, Puzzles, Screen protector, RAMdisks, Snapshot screen saver, Directory printer, Maze game, RAM free plus, Init disk, System (configs printer modem, colours, has note pad and much more in 28k!), Mites, IBM block terminal, Note pad, Phone pad, Goodies, Remember, Mites, control panel latest version - time and date work properly, VT52 RS232 config, plus others.
DA3 : 15 Titles - W/P tools,Diskman - disk utility, Minidos - disk utility, X - utilities, M and T - ramdisk and spooler, New Word (word processor) this is truely very good and very useful has many features and manual, coder, uploader use with Fastcom to combat its inability to upload messages written off-line to anywhere other than page 7 in Prestel, Alarm clocks - very good, Schnapp saves screen to buffer and then will dump when you want, MAD 2 different .acc s that muck up the screen ramdomly. One scrolls the programmers name throught the mouse pointe!, Proi painter dumps to disk a markesd block of screen.
DA4 : 9 titles - Rat Trap - brilliant program that allows you to change GEM menus from ST drop down menus to Macintosh pull down menus- excellent, Calc 7 scientific calculator and 'C' code, Caps Off/On - displays at top of screen nice and boldly whether aps lock key is on or off, Private eye - excellent tells you all about the inside of your machine, Bigmouth - jokes, Reverse screen. RAMBuffer nice clock and RAMdisk program.

Game Disks

GAM11 : 4 Titles - Azarian full colour asteroids space invaders game - excellent shoot 'em up! Farm yard colour memory and guessing game very very nice. Invader - colour space invaders. Bridge-it! computer version of the 'September' board game - excellent.
GAM12 : 2 Titles - Lunar lander colour only, Spacewar Colour and Monochrome,. Both of these games are excellent.
GAM17 : Diamond colour only shoot 'em up game from BUDGIE software.
GAM18 : Football Colour and monochrome speculation game from BUDGIE software.
GAM19 : Blitz III colour only bomb dropping game which I originally saw on the a VIC20 from BUDGIE software.
GAM20 : Othello colour and monochrome classic game from BUDGIE software.
GAM 29 : Strip Breakout - knock out the bricks to get a picture of a naked women colour only.
GAM30 : Quizz - Trivia game creator editor, Runners Revenge - Loderunner lookalike mono only.

Graphics Disks

GR1 : 12 Titles - NEOchrome version 1, Palette, DR doodle, Palette setter, Doodle to Degas converter, Effects (slideshow that does effects on any NEO pics with a 'PIC' extender, Windpics(loads all the NEO '.PIC' pictures in disk a into a seperate window allowing you to have all On screen at once), 3-D designer (draw images and make them move!, Sprite designer, Shrendraw - drawing program and pascal source code, another bigger Sprite editor! and Degas fonts.
GR2 : 5 Titles - Grafcon, Degas to RLE converter, Dump-to-gem dump Degas files to Gemini printer, Megablit a very good drawing package with all the features, Picture converter including Art director to NEO/Degas, PI3 to NEO, Little Painter German paint program mono only, Degas converter and printer full GEM.
GR3 : MASTER Painter - excellent graphics program works in ALL resolutions in NEO Degas and Doodle formats. Has multiple screens 6 on 1/2 Mb, upto 24 if enough RAM, animate between these multiple screens, all the usual tools plus rotate to any angle, skivle- horizontal and vertical, zoom, twist, built in converter, very well laid out and designed- full GEM but this does not slow it down in the way maybe Degas Elite is. This is a truely brillinat program. Also Paintlux a monochrome painting program in GEM and German.
GR11 : 11 picture converters and utilities - PICswitch 0.7, NEO to mono etc.

Language and Music Disks

L5 : 'C' Compiler including Text Editor, not for the absolute beginner and certainly not a tutorial, this disk contains all that you need to compile C source code, it is very very good, so before you spend £100 plus on a commercial C compiler C if you like C with this excellent PD compiler.
L6 : Toy Prolog - German full documention, demos and source codes.
M4 Midi sequencer excellent play and record etc. very good.
M7 : MidiDrum and MidiPlay - 2 great midi progs - mididrum is a drum machine, and midiplay a sequencor fully programmable - mono and midi only.

Miscellaneous Disks

W1 : 1 Title - 1st Word with manual, tutorial and 18 printer drivers.
W2 : 1 Title - STwriter with manual, tutorial etc. 2 versions 1.75 and GEM/text based 'Elite' version of STWriter. the same program that can be switched into GEM mode and back to original non GEM version, usual full manual and quick reference etc. with new features. very good word processor.
SOL1 : Solutions for dozens of adventures. Disk directory listing is : crowley, amazon, zork3a, enchant, zork2b, zork3, infidel, institut, ghost, hitchike, deadline, blckpool, adventur, funhouse, count, mas, caribean, hitch, adven550, colossal, alice, cuthroat, cyborg, dragon.
SOL2 : Solutions for dozens of adventures. Disk directory listing is : ultima3, zork1a, ultima1, sorcera, sorceror, zork1, zork1b, mindwhel, zork2a, ultima2, zork2, quest, morgue, questron, seastalk, planet, suspect , starcros, ulysses, transyl, suspend, voyage, wizard, odyssey, pirate, voodoo, witness, mask, mission , newdosed.com, notes539.txt.
IBM 1 : Chasm - Assembler/ Disassembler/ Debugger/ for the IBM. Enables you to write IBM machine code/ Assembly language programs on the ST. Full documentation
Requires IBM Emulator e.g. PC-Ditto.
IBM 2 : ChemView - Chemistry tutorial. Teaches Valency, Bowding etc. Full documentation. Requires IBM emulator e.g. PC-Ditto.
DEMO51 : ST Tour! An excellent demo for all you New STers. The tour works in Monochrome and in Colour, and shows how to use all the features of the ST, including desktop accessories, menus, windows etc. This is very , very good.

Double sided disks

The following are some of the single sided disks from the catalogue that have been paired together and put onto one double sided disk. Note to use double sided disks you must have a double sided disk drive for your ST.

AP13 +	AP38 -	STUK1	GM11 +	GM12 -	STUK56
AP36 +	AP37 -	STUK2	GM17 +	GM18 -	STUK57
AP24 +	AP29 -	STUK29	GM19 +	GM20 -	STUK58
AP40 +	AP52 -	STUK30	GM29 +	GM30 -	STUK71
AP35 +	AP51 -	STUK33	GR2 +	GR11 -	STUK38
AP50 +	DEM51 -	STUK34	GR1 +	GR3 -	STUK39
AP41 +	AP44 -	STUK88	L5 +	L6 -	STUK22
AP5 +	AP6 -	STUK44	M4 +	M6 -	STUK25
DA1 +	DA2 -	STUK11	W1 +	W2 -	STUK17
DA3 +	DA4 -	STUK12	IBM1 +	IBM2 -	STUK10
SOL1 +	SOL2 -	STUK5			

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STAD is a new bit-map oriented painting, drawing and design program. John Nuttall discovers that it has much to offer.

"S.T.A.D"

Have you been smitten with the software bug? I'm not talking about all those wretched virus things that infest your computer. What I mean is that more dreaded plague of rushing to buy the latest piece of software, only to find a few weeks later that it has been superseded by a better, all-singing, all-dancing program. Out you rush to get it and put the old software into early retirement. If I had a pound for every art package I've bought... So a new drawing program has to be rather exceptional to survive a rather overcrowded market. STAD (it stands for ST Aided Design) hails from some rather clever people in Germany - Applications Systems of Heidelberg. Perhaps the title tells us something about the niche the product is geared to. It has all the features one would need for a drawing or design program, but it has a very powerful 3D section as well, enabling objects to be created and viewed and rotated.

But STAD offers more. Although it only works on a monochrome monitor, it will work with just about any ST. It is intelligent enough to recognise available memory, and I was somewhat amazed to discover that I had 100 drawing screens available on a Mega ST4. I imagined this was a luxury I could never exhaust, but I came near the limit since the other screens were used to prepare material to be incorporated into my main drawing screen, including material which had been constructed in the 3D section and brought back into the drawing area. If you do not own a Mega ST, you'll still have more drawing space than most other art and design packages permit.

I know it is a subjective consideration, but for me the most important feature of STAD is that it acts like a "hub" because it has all the necessary links and interfaces for all the devices a good artist might require. It comes with a wide variety of printer drivers, and you can also fiddle your own if you have one of those non-standard printers. It also comes with drivers for a Hewlett Packard LaserJet and the Atari laser printer. A further observation has to be made in reference to the SLM804 driver: the speed is very impressive. STAD works with just about any graphic tablet on the market and this could been a significant feature. I tried it with the CRP graphics tablet and it worked fine. However, the puck option would be a better choice because when you exit a drawing feature in STAD you need to right click on the mouse and the supplied stylus with the CRP tablet has no way of emulating that action.

"It has all the features one would need for a drawing or design program, but it has a very powerful 3D section as well, enabling objects to be created and viewed and rotated."

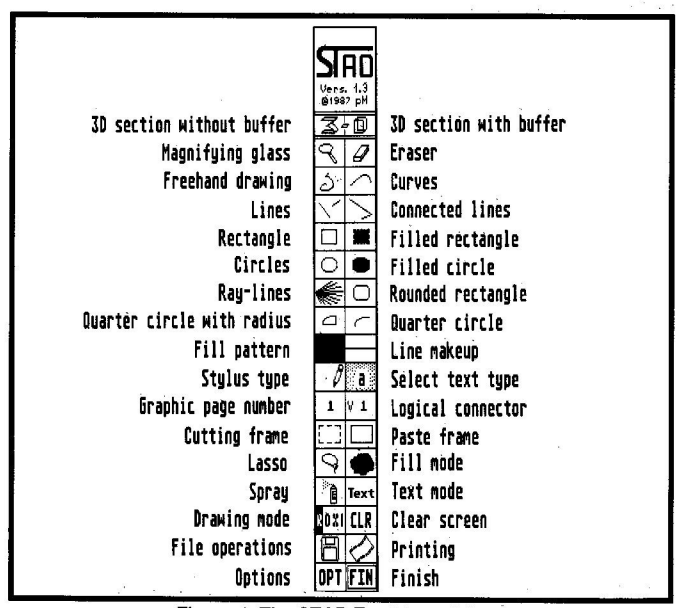

Figure 1 The STAD Toolkit explained

Still, in the realm of the links the software has to the outside world, if you own a scanner, you will find ample provision for scanning material into STAD. It has splices for the Hawk and Spat scanners, as well the little Handy Scanner which was reviewed in ST World (issue 29, page 24). The scanner option box also makes mention of the Easytizer scanner and a STAD-Scanner, and the latter option looks interesting because it appears to be a device to clamp onto the head of a dot matrix printer.

Down to the pixels

STAD comes on a single disk containing the program itself (167K), numerous samples of artwork and 3D objects, printer drivers, a font editor and some sample fonts. The last two items are particularly useful because the package has quite reasonable text handling facilities. Printer drivers are installed quite easily and they can be made to load with the software, or selected from an options panel once the program has loaded. In similar fashion, the drawing stylus can be custom edited and loaded automatically. Along

with the disk comes a 100-page manual with illustrations and a tutorial section that ought to introduce you to most of the features quite quickly. While I found the documentation quite good on the drawing side, I did find the 3D section a trifle obscure, particularly when it came to some of the facilities such as "projection planes" and X-Y-Z axes.

Once loaded, the program presents the user with a standard screen-size canvas, with all drawing tools available from a single menu on the right hand-edge of the screen. Each feature is obtained by a left click on the relevant icon, and the annotated main menu describes them all, in figure 1. Once an item has been chosen, the menu strip withdraws and will return only when the user right-clicks the mouse. It works quite well, in the fashion of ComicWorks on the Mac, but some selection boxes have multiple choices, such as the option box, and I wish there were standard GEM pull-down menus available as well. Curiously, although they are lacking in the drawing side of the program, they are there in the 3D part, which means that any accessories loaded will only be available in half the program. Any new software that ignores the graphics standards of other art packages is doomed to remain in the oblivion from which it should never have emerged. Fortunately, and by good design, this software is exemplary. STAD will load or save the usual Degas PI3 format but it also handles medium resolution material too. Neochrome files can be loaded and converted, and they will need to be reversed because they appear as negatives on the screen. Doodle format is also recognised and there's a packed format option which appears to reduce Degas files by a factor of eight. The manual states that images from Signum 2 are also recognised and loaded, although I have not tested that particular link. Lurking deep in the program is an animation facility which could be put to good use providing you have enough RAM available. I tested it using a series of screen dumps on a provided utility, and it was possible, given the correct speed adjustment, to create the illusion of a frenzied ST with a mind of its own - sizing GEM windows and pulling down menus.

Although STAD is not an object-orientated art package, that does not appear to me to be a serious limitation. It offers a fair degree of precision in having a grid available (with snap-to-grid options), but sadly no rulers. Coordinates may be displayed, and this gives some indication of line lengths as well as angles between lines. The curve and circle drawing routines are certainly a cut above the average. What makes this software exceptional is the concept of the buffer. For example, objects can be designed and created in screen two and cut from there into a buffer. On returning to screen one, they are retrieved from the buffer and pasted into work that is already in place. As if that were not enough, you can select the way the material from the buffer will relate to existing artwork. It can either replace what was under it, or via logical connectors, it can be ORed, ANDed, or XORed. It takes a little forethought, but some subtle effects can be created. Further enhancements will display your artistic merits to the full, because two graphics screens can be related to each other, again using logical connectors. All in all, although not object orientated, STAD allows objects to be positioned carefully, and in a way that I have not seen on any other ST software.

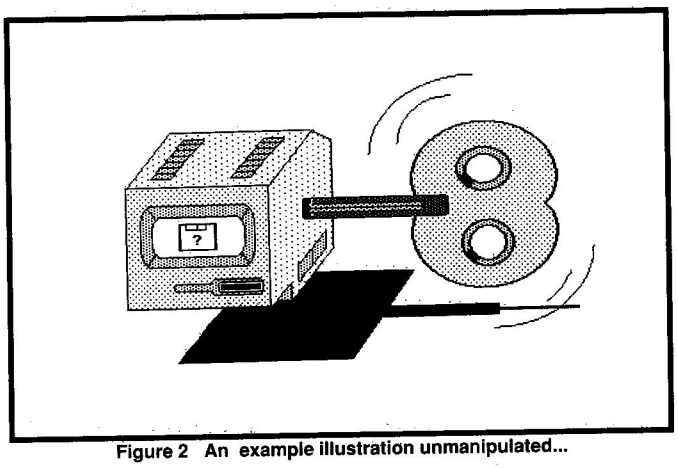

Figure 2 An example illustration unmanipulated...

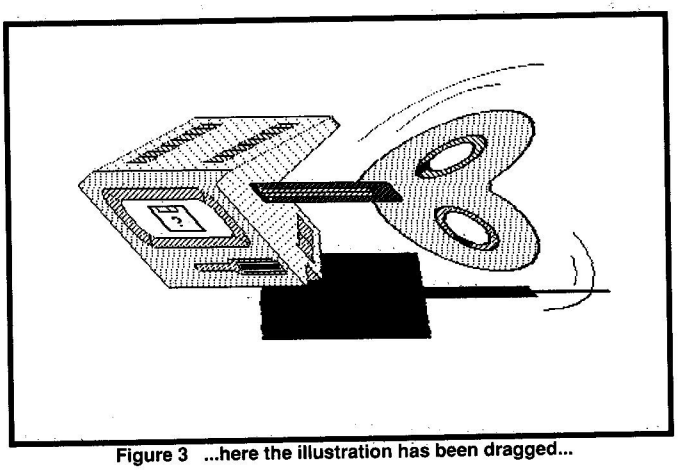

Figure 3 ...here the illustration has been dragged...

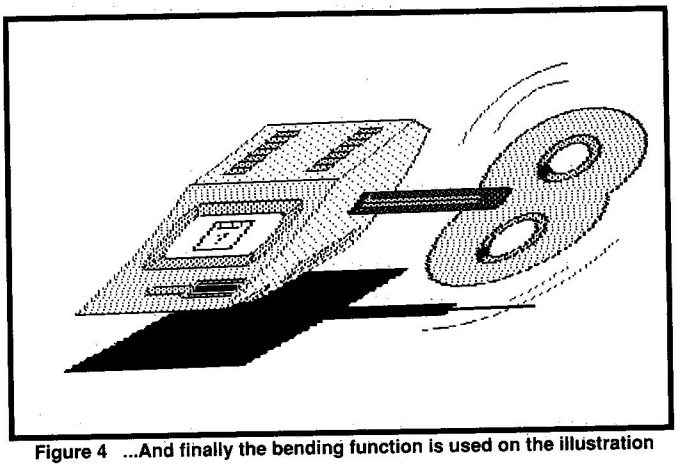

Figure 4 ...And finally the bending function is used on the illustration

There are times when simply moving an object is not sufficient. Manipulation might also be required. While the cutting frame is in position, there are a host of features which can be called. These include: making a copy of the image, turning it left or right, doing a mirror copy, bending the picture, inverting the pixels, adding shadow along two edges, and various sizing operations. The illustrations (figures 2,3,4) show some of the effects which are both clever and useful, and they include a normal drawing and one which has been dragged and another subjected to bending.

Other features of the drawing side of the program which must be mentioned are an indication of the thought that must have gone into its creation. Most line drawing operations and fill pattern selectors have an edit feature which allow the user to design, save, and load more useful tools. Filling operations can be either local or global, and the spray can be toggled to spray black or white pixels: it could then be turned into a soft eraser. Text can be added and in a variety of supplied fonts and heights, along with special characteristics, such as bold or light or outlined, as well as the angle of placement (0, 90, 180, 270 degrees). I did encounter some difficulty loading fonts: they simply refused to present themselves, and this may stem from a conflict with GDOS which isn't required for STAD to run anyway. There are many user-selected options too. I have often been in the position of trying to erase items from a screen using an eraser about the size of a pinhead. STAD lets you determine what size you want it to be by providing you with a mouse-controlled sizing box. You can turn on a symmetrical drawing function, and have it work either on the x axis or the y axis or both, or, if you prefer, on the zero point, which is normally centre of screen. The printer offers all

sorts of permutations for printing; print one or two or more screens per page and something called catalogue which dumps eight miniature screens to paper. The final word for now must go to the magnifying glass, as figure 5 demonstrates. The effect in moving the glass over your drawing is quite staggering. A further click on the mouse and you are down to the pixels.

The 3D part

The 3D section is not another separate program to STAD but the other side of the coin. It can be entered in two ways from the "3D" part on the top of the menu strip. The two ways of entering will determine whether the user takes the buffer contents along or not. Here we enter the more conventional side of GEM since everything is controlled by pull-down menus. Two types of 3D objects can be constructed here. One type is a SPIN object which is first constructed in outline form and when finished, the computer then adds all the extra lines, spinning them out from a central axis. Figure 6 shows one such example, constructed and rotated. The second, more complicated sort is a wireframe object which takes more effort and skill to compose, especially if you need to think about hidden lines as an object rotates. The data for such objects can be input either by using a mouse to "click" in the corner points and surfaces, or from the keyboard if you when you have worked out the coordinates. There is even an appendix at the back of the manual which describes how to do it all in assembly code. The important thing to remember here is, when describing the surfaces (for example, in a cube), you need to mark the surfaces in clockwise fashion - not clockwise as they appear to the user, but clockwork as the surfaces relate to each other. If this is not observed, hidden lines are not worked out correctly. Figure 7 is an illustration of one of the complex 3D objects supplied on the program disk.

It would be possible then to construct a 3D object and then take it back to the drawing program, add some text or shade in parts of it, or even take back different views of the same object. and the completed object can be made to spin in the x

"The effect in moving the glass over your drawing is quite staggering. A further click on the mouse and you are down to the pixels."

Within STAD, movement of the object is controlled by the keys of the numeric pad or y or z axis at a variety of speeds. It's a shame that a screenshot cannot capture

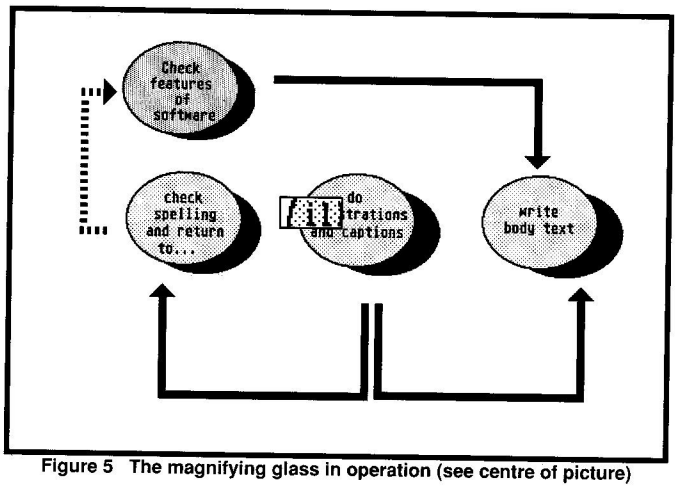

Figure 5 The magnifying glass in operation (see centre of picture)

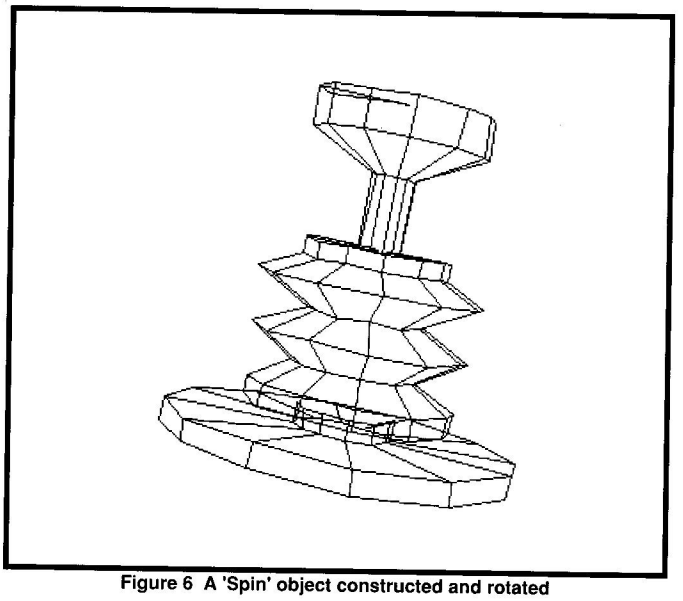

Figure 6 A 'Spin' object constructed and rotated

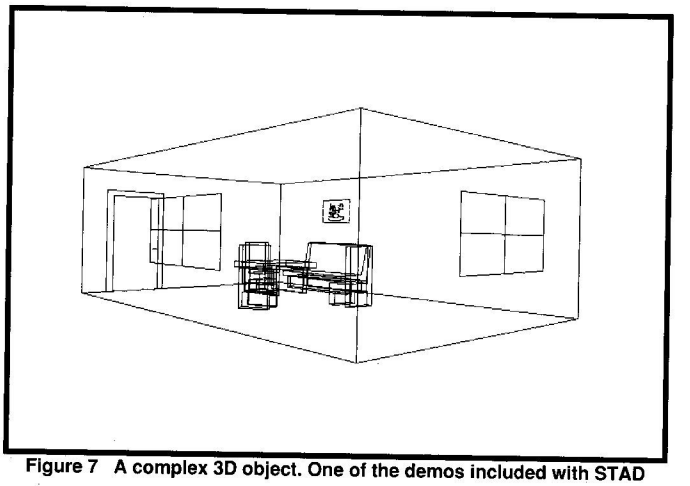

Figure 7 A complex 3D object. One of the demos included with STAD

both the speed and smoothness of a rotating object. The program disk comes with a few samples of varying complexity and some of them look quite dramatic. Several objects (to a maximum of 100, depending on available memory) may be combined. Further control is available to the user and includes such things as the number of edges and the angle of spin in an object, the scaling factor, and the angle of projection. Three different projection types are included and these are perspective, parallel and orthographic. The screenshot in figure 8 depicts some of the range of parameters which can be changed. In reality, the building of complex 3D models comprised of several related objects is going to be an arduous and demanding process, especially if you want hidden lines as the block rotates. The best piece of advice is to save your work at regular intervals so that if a mistake is made you can always call up the last correct section. Curiously, one part of the menu was never available to the user and it was a feature called "Shaded". Closer inspection of the manual revealed that an update to this current version of STAD will include automatic shading of object surfaces as well as a second hidden line algorithm enabling 3D objects to produce a shadow and at the same time permit the "light source" to be changed. This section proved fascinating but I suspect its use in the real world would be to take back illustrations into the drawing part of the program so that different views can be presented, or to take freeze-frame snapshots for illustrations. The sort of effect you might obtain is demostrated in figure 9 where the same object has been rotated and sized and taken back to the drawing program to be filled. Nevertheless, its potential is limited only by your patience and imagination.

Conclusions

As my own particular interest is in desktop publishing, at the moment the ST community is fairly well served with DTP packages (although I am still waiting for the perfect software). There are also a number of scanners around

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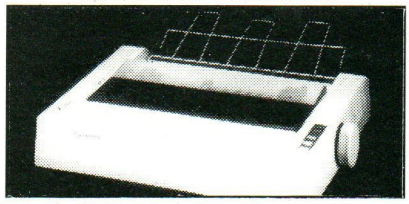

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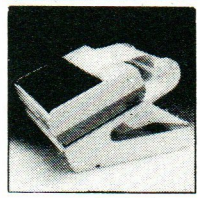

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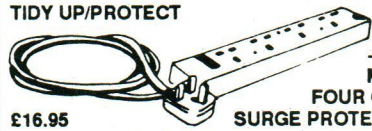

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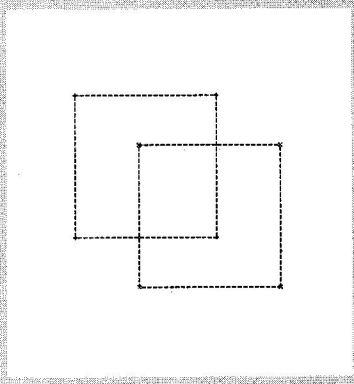
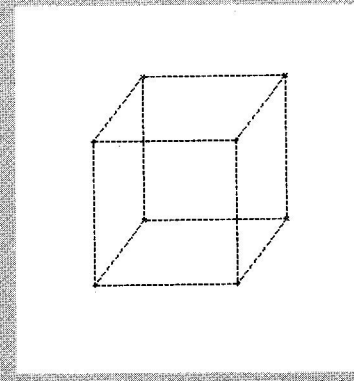
"S.T.A.D"

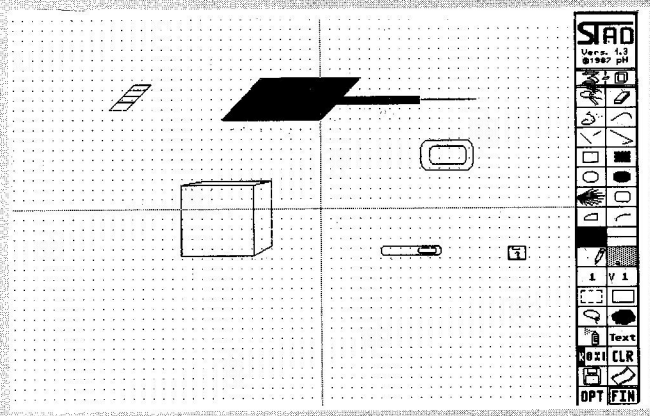
Describing the features of an art package in print is rather like painting without a brush, so the next section describes some of the steps that were taken to produce a piece of artwork. I wanted to produce the sort of illustration as shown in figure 17. The steps involved required a cube to be drawn and then further bits and pieces added, along with a ghost image.



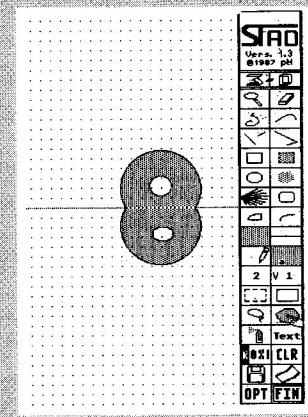
1. It was probably easiest to construct the basic outline of the computer in the 3D area. One face of a cube was constructed clicking the points into place and using the top left hand coordinate figures as a guide. Once the back face had been constructed, a duplicate could be created quickly by pressing the "F" key, thus providing the front face.



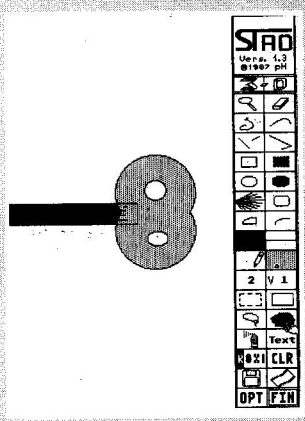
2. With the front and back faces in place, all connecting lines can be added manually or, as in this case, automatically by pressing the "K" key. The next operation was the trickiest, because I wanted certain lines to be hidden, so all the surfaces have to be marked in the correct fashion. When the cube was complete, it was rotated slightly and resized. Finally, it was exported to the drawing side of the program by selecting "QUIT WITH 3D OBJECT" from the menu.



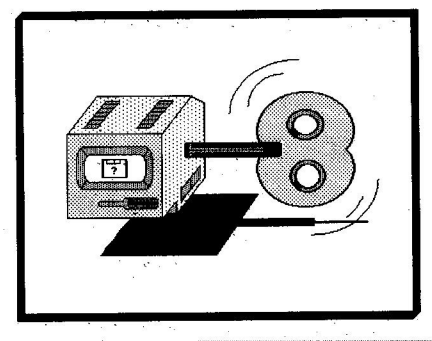
3. In the drawing program, the cube and all other parts for the design have been placed down, with the exception of the "winder". The grid has been switched on so that the objects are constructed to the right size. The shadow area will require a piece to be taken out of the top left hand part of the box, using the eraser. The small disk icon needs a question mark inside it, using a 6 point typeface so that it fits. All parts were then assembled either using the cut and paste routines or, for finer work, the lasso.



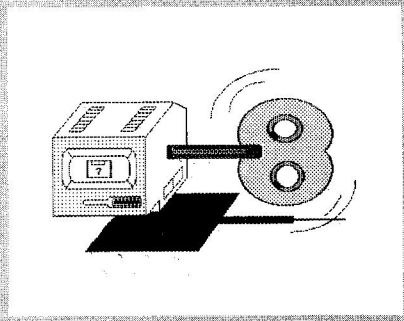
4. We have now advanced to working screen two, to prepare the "winder". The symmetrical drawing aid was turned on the X axis, so that two circles would be drawn in one operation. Where the circles touched, lines were erased using the pixel editor. Two smaller circles were added to the centre positions, and also a fill pattern.



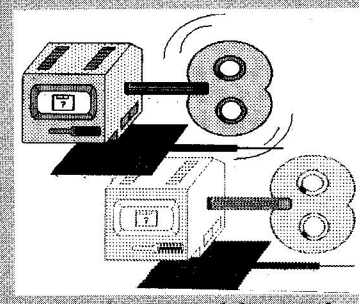
5. Adding the central stem, we are nearing completion of this part of the operation. In fact the central stem was created in screen two and moved into position via the paste frame. Before it was finally fixed, I went into the OPTIONS box and changed the out-buffer to OR so that the stem would not replace the background. Finally, the entire construction was taken back to screen one and pasted to the right hand side of the computer.



6. The elements are now in place. I had to do some pixel editing to get the shadow to fit snugly under the computer. The back of the box was partially erased, and a corner added, to give less of a box appearance, as was the front right hand corner. Fill patterns have been added and a couple of curves around the winder key, to give the impression of movement. A frame was also added using a thicker stylus and the unfilled rectangle option from the toolbox. Finally, in case of disasters later, the picture was stored to disk as a Degas



7. I'm afraid the whole thing looks a bit anaemic at the moment. All the screens were cleared and the original loaded back into screen one. The border was removed using the eraser. Meanwhile, in screen two, a fill pattern was chosen and the whole screen filled. Screen two was now logically connected with screen one via the AND connector, and suddenly something slightly more exciting was produced. It was safer to AND screen two with screen one rather than screen one with screen two; that way, if there was a disaster, the original screen would be preserved.



8. Lastly, the contents of screen two were blended with screen one by cutting and placing the second image, having first chosen the XOR mode from the options box, so that the last image did not replace the first one. Total construction time about 35 minutes.

for getting images into the layout software. It is even possible to grab a video image and use that in your documentation. What has been lacking to date, is some good software that could cope with illustration work, and I see STAD as a first-rate offering in that direction. Although I have very little artistic talent (some would say none), I found STAD let me do things that I thought I could tackle and in the way that I wanted to do them. Mistakes were easily rectified by the UNDO key, and I found the concept of a large number of working screens coupled with the buffer operations a positive advantage; things could be tested in screen fifteen to see if they would work, and only then fixed into the work area. And if you are the owner of a scanner and a graphics tablet (and even a laser printer), there is nothing on the market that enables them all to talk to each other, and there should be no reason for second-rate design or drawing work.

STAD looks fairly robust, and if further updates are delivered, as suggested, it will not die the death of being fantastic in 1988 but a shade behind the times in 1989. Although the price is higher than other products on the market, so is its specification. I suppose the proof of the ultimate pudding is that I have now deleted a certain other drawing program from my overcrowded hard disk, and made STAD a permanent fixture.

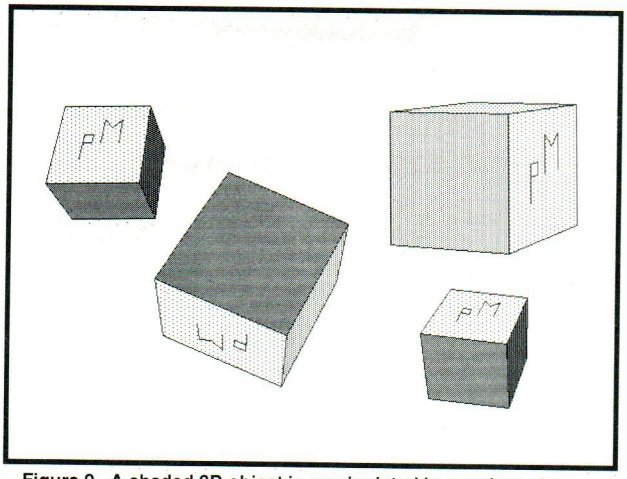


Figure 9 A shaded 3D object is manipulated in a variety of ways

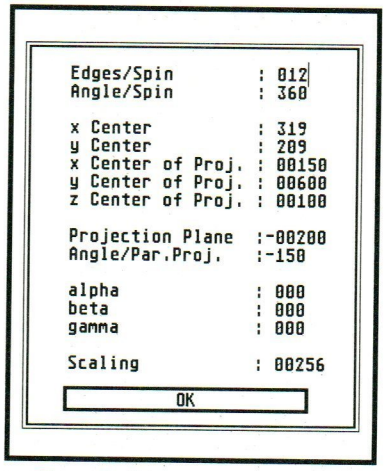


Figure 8 Parameters available for manipulation of 3D objects

Product:	**STAD version 1.3**
Price:	**£100 inc VAT.**
Publisher:	**Applications Systems GmbH**
Importer:	**Signa Publishing Systems Ltd**
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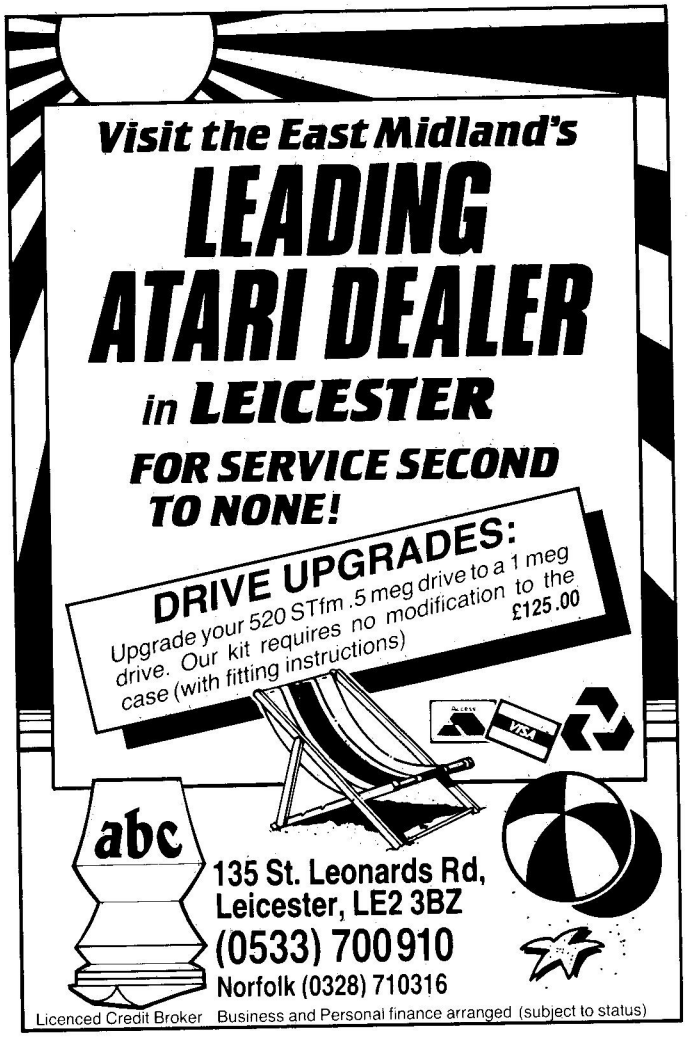

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by Eddy Yeung

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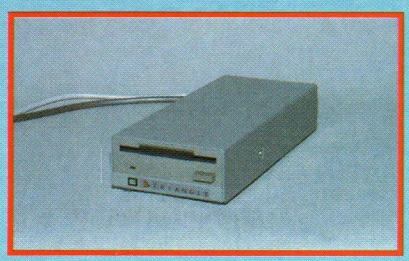

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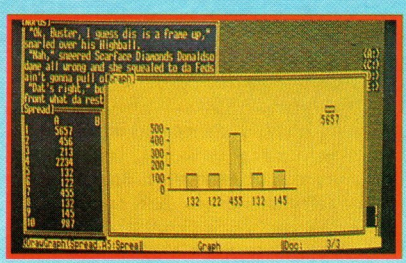

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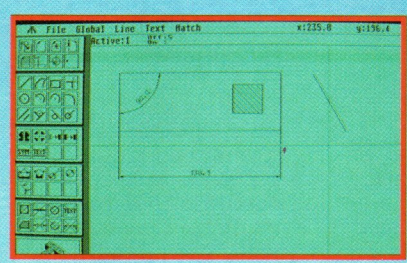

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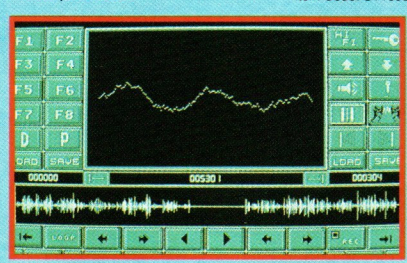

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FD10 DRIVE

Most people's idea of mass storage, beyond the ordinary disk drive, is typically the ubiquitous hard disk drive. One example of this sort of technology is the Supradrive range of hard disks, by Supra in the States. Ian Tindale examines a variation on the theme - the Supradrive FD-10 ten megabyte 5.25" floppy drive, marketed in the UK by Frontier Software.

The idea of a removable hard disk must have crossed the minds of many a hard disk user at some time or another. Very recently, advances have been made in magnetic storage techniques which make it possible to store up to 10 MB on a single 5.25" disk, using a rather special disk format, very highly precision disks, and a unique kind of disk drive, and a technique known as vertical recording, which essentially records into the depth of the magnetic media. The result is a drive, looking for the most part like an ordinary 5.25" slimline drive, which can accept disks which look like ordinary 5.25" disks, and yet onto which you can read and write 10MB of data.

Environments and working modes

The main advantage, as I see it, in having removable ten-megabyte disks is one concerning the way people tend to use their computers and computing environments. For most people who use a hard disk, the natural thing to do is to partition the hard disk into 'logical drives'. These appear to the system as separate drives, but are, in fact, parts of the same hard disk. It is usual for these logical partitions to become used for functionally separate modes of operation.

To give a loose and hypothetical example, drive C usually becomes the boot drive, and accessories go there, so other utilities often live there, and other things related to utilities, and so on. Drive D might be for all your word processing activities, so all the applications and other things in that line of activity go on drive D. You might like doing graphics, so you could have a partition for graphics-related applications. Accounts could be in a separate partition too, as could music, CAD, DTP, comms or programming. The point is, one usually tends to do one thing at a time, not mixing up one activity with another, so it becomes comfortable to split up everything you do into these partitions.

This means that in a given work session on a hard disk-equipped ST - for example, doing your accounts - you will never need the graphics, music or programming-related partitions and their contents. While they are resident on the hard disk, this could, in effect, be seen as a waste of space. It would be nice to have unlimited amount of space on your hard disk for more partitions, and yet more. In practice the partition size rarely exceeds ten megabytes, unless you work in specialised situations, perhaps requiring immense space for audio or video sampling. If all you need in a partition is about 10 megabytes, then a drive, such as the FD-10 which can accept a 10 MB disk, will suit your mode of working, and allow as many lots of 10MB as you can afford disks.

Parking space

Like a hard disk, the FD-10 needs to be parked before you move it. Unlike a hard disk, the FD-10 cannot be partitioned. Perhaps there is no point in wanting to partition an FD-10 - I feel that 10MB makes an adequate partition size, personally. The system can be set to autoboot, and you will have to set each disk to autoboot if you want to be able to boot from any drive, otherwise simply set one disk to autoboot and use that as a huge boot disk. You can always boot from the Supra hard disk bootup floppy disk in the ST's drive A, if you don't want autobooting. If you set each disk for autobooting, you can take advantage of different environment setups for each work mode. In autoboot mode, you will need to let it get up to speed before switching on the ST.

It is very easy to use, becoming transparent in operation once the disk you are working on is loaded. Backup can be carried out in the same way as would a conventional hard disk. The ST treats the FD-10 disks as if they were ordinary ST disks with these exceptions: Upon changing disks, you need to wait 10 seconds from closing the drive door before you press ESC to re-log the disk; unlike a floppy disk, you cannot copy from one disk directly to another. The only way of effecting a total one-shot transfer of contents between two 10 MB disks is with a hard disk in the system, with 10MB of room to spare. Otherwise, for copying single files, a RAMdisk, hard disk or conventional 3.5" disks can be used.

As with all current products in the Supradrive range, the FD-10 comes with SCSI and DMA sockets on the rear, and a real-time clock. There is an attached 60cm cable and 19-pin D-type

Supra's FD-10 drive. Ten megabytes on one special 5.25" floppy!

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STWLD-1088

FD10 DRIVE

plug for connection to the ST's DMA port. The DMA address of the FD-10 is set to device 4, LUN 0.

Reading history

The FD-10 can be used to read IBM format disks, and this can be used as a method of transferring IBM programs and data to ST format, if you are a PC-emulation fan. This was tried with several IBM disks, which all worked. I also tried it with some disks from a Future FX-20 computer, which is 720K and non-IBM, and this totally confused the FD-10, so IBM disks only! Note, the IBM feature will only read from an IBM disk, you will not be able to write back to one.

The disks used are Konica, specially pre-formatted. The label says: Double sided / Extended high density, 480TPI servo written. Apart from the label, they would look exactly like a conventional IBM disk. If you try formatting this disk on any other kind of drive, you will permanently wreck the disk. FD-10 disks are formatted, not from the desktop, but from the usual format utility for Supra hard drives, taking approximately 30 minutes to format a 10MB floppy.

In use it feels like a hard disk would, i.e. you don't notice it, as there is nothing to notice if such a system works properly. Every time the drive needs to access the disk, you hear a mild whirr and see the two busy lights on the front light up, one on the box and one on the drive itself. Were a hard disk to be fitted internally, the busy light would indicate the controller board inside being busy, regardless of which drive it was controlling.

The FD-10 lets you expand your mass storage facility simply, easily and cost-effectively. It also imposes a little structure on how you organise your ST work, and one would hope that they don't simply become big disorganised 10MB piles of files. In effect, it takes the partition idea of hard disks, and makes them a physical reality.

It is not cheap, initially. This is actually an illusion, as an example, say you bought an FD-10 plus three disks, and your friend bought a 30MB hard disk, he may save a small amount of money, and you may gloat at his higher speed. But when you decide you need 60MB, you simply buy three more disks. What does your friend do? If he sells his 30MB and buys a 60MB, you can buy another six disks at a very low outlay and watch him try and find 120MB of mass storage at as low a cost as you appear to have done! See my point?

Comparison Chart

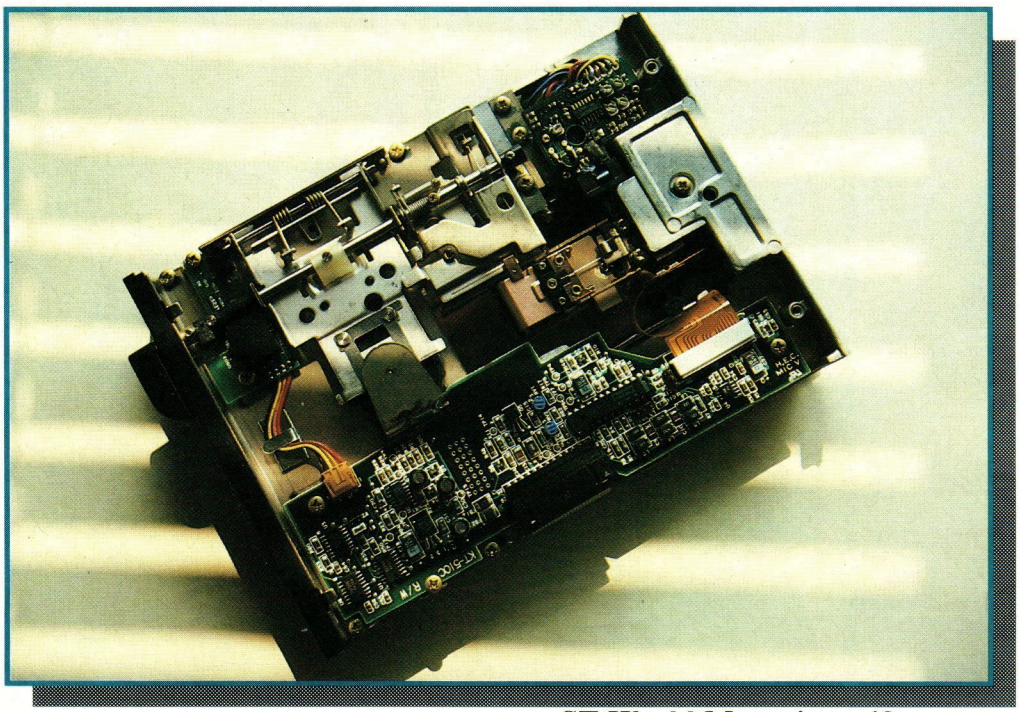
Parameters	Supra FD-10	Supra 20MB HD	Atari SH205
Cost incl. Vat	£849.95	£549.95	£599.95
Formatted Capacity	10.49MB	20MB	20MB
Drive Mechanism	Konica KT-10	Miniscribe 8425S	Tandon TM262
Fan	optional	yes	yes
DMA in & out	yes	yes	yes
DMA address:LUN No.	4:0	0:0	0:0
Media	removable*	fixed	fixed
Media cost	£17.95*	n/a	n/a
Max partitions	can't partition	12	4
Autoboot	yes	yes	-
Time to write 600K continuous memory:			
(112.3s floppy)	8.8s	4.9s	5.0s
Time to read 600K continuous memory:			
(54.2 floppy)	7.2s	3.6s	3.5s
Power up & boot	18s	20s	26s
Boot after reset	9s	10s	13s

* Pre-formatted. Available only from Frontier Software.

See p42 of ST World issue 18 - August 1987 for HD supertest.

Conclusion

It is important to realise that you can add a ten megabyte 'partition' at a time very cost-effectively. This is compared with trying to expand an existing hard disk, which can't be done - only replaced, or added to with another hard disk drive (which is possible on Supradrives). The other main point is that of portable and conceptually separate 'environments' in which you carry out your work. If you need to transfer large quantities of data from place to place, or if you like to transport your working environments between two STs, this is ideal. Even if there is no mobility involved, the idea of having an effectively different environment, complete with all the data and applications you require on one load-and-forget disk per task, certainly must hold appeal. Finally, it makes a very effective backup device for a hard disk. Well done, Supra! END



The FD10's Konica Drive.

Product: SupraDrive FD-10 10MB floppy drive

Manufacturer: Supra Corporation, U.S.

U.K. Distributor: Frontier Software, Harrogate, Yorks.

Phone: (0423) 67140

Price: £849.95 incl. VAT

Media price: £17.95 each

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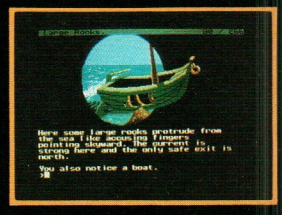
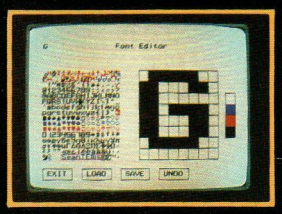
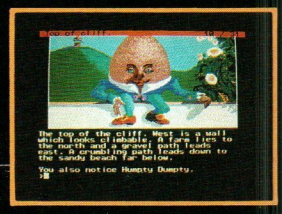
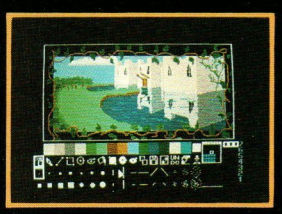
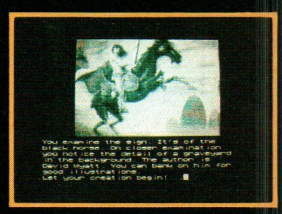
ST USER

STAC

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- ★ Synonym recognition
- ★ 40 and 80 column text under player control. Change from within STAC and the adventure
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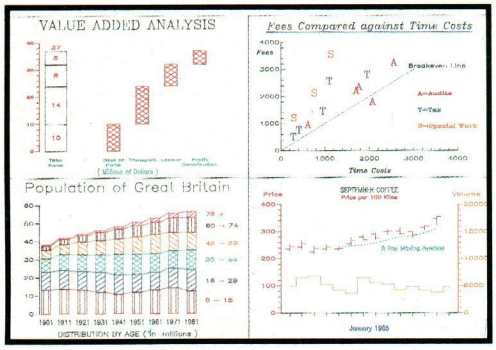
UPDATE LOGISTIX UPDATE

Logistix, winner of the ST World Spreadsheet Supertest, has now been upgraded *Roland Tongue* reports.

Logistix is, in my opinion, the most versatile spreadsheet/business graphics package currently available for the Atari ST. As well as an extremely comprehensive spreadsheet, the user is provided with sophisticated 'presentation quality' graphics and a basic, but quite useable, time management package, which includes a critical path analysis function for project planning - all for £100 plus VAT. This excellent package has now been further improved in the new release - Version 1.2. Atari users of Version 1.1 may upgrade by contacting Grafox who write and publish Logistix.



Presentation Quality Graphs produced on a pen plotter.

Logistix was originally written for the IBM PC and has achieved considerable success, with over 50,000 copies in use throughout the world. Grafox estimate that over 6,000

```
   |   A          |   B          |   C     |   D   |   E   | F
 1 HOUSE IMPROVEMENT: A SIMPLE EXAMPLE OF LOGISTIX
 2 ---------------------------------------------------------------
 3 SKILL            COST PER DAY
 4 Labourer                £65
 5 Plumber                 £85          ----------------------
 6 Carpenter               £75          THIS IS THE DATABASE
 7 Painter                              ----------------------
 8 ----------------------------
 9 JOB              SKILL        COST PER DAY  LENGTH  COST PER JOB  CODE
10 Build stairs     Carpenter           £75       6                  BLDS
11 Fit cupboards    Carpenter           £75       3                  FITC
12 Fit pipework     Plumber             £85       2                  PIPE
13 Paint cupboards  Painter                       3                  PNTC
14 Paint stairs     Painter                       4                  PNTS
15 Rads and boiler  Plumber             £85       3                  RADS
16 Tidy up          Labourer            £65       2                  TIDY
17                                                  -------------
18                                             TOTAL:
19 ===============================================================
20
   577K  B5(NMBR)=85
ENTER: Use arrow keys to move around, HELP(F1), or one of the following:
     +Expr "Text 'Rpt ,Graph <Time /Cmd =Goto !Recalc ;Jump
```

The Logistix Worksheet Screen.

copies of the Atari version have now been sold, with more than 1,000 of these in Britain. For some reason, UK Atari users seem reluctant to register their purchases thus denying themselves news of upgrades or other user information. Logistix is also now available for the Amiga and Archimedes ranges of computers.

The upgrade

The upgrade is supplied as a replacement program disk, an examples disk and 12 replacement manual pages. Logistix version 1.2 requires a double-sided disk drive and at least 1 Meg. RAM. Version 1.1 was issued with a cut-down version of the program which would run on a 520 ST, but this is no longer supplied.

The upgrade does not introduce any radical or new features, rather it significantly improves many of the features or options already offered; it is this attention to detail that lifts Logistix above so many of its competitors.

There are two major areas of improvement in this upgrade: file handling and manipulation of blocks of expressions.

File handling

Though Logistix has always been able to load files in a wide variety of formats - Logistix, Lotus .wks, Supercalc .cal, Ashton Tate dBase, Comma Separated Value, Data Interchange Format .dif and ASCII text files - the range of saving formats has been more limited, with the noticeable omission of the Lotus format. Now the range of saving formats is the same as that for loading. The ability to save in .wks format is a significant improvement.

The ability to load and save different format files allows the user to import data from other sources into Logistix for compilation or to utilise the graphing or time sheet facilities unique to Logistix.

Another new option allows the user to specify the location on the worksheet into which the new files are to be loaded, enabling Logistix worksheets to be used as 'templates' into which data or whole sheets from other programs may be loaded. This is potentially another very useful addition to the list of Logistix functions.

Expression manipulation

This upgrade offers improvements in both the replication and cell movement routines.

As all spreadsheet users will know, replication - copying a cell or block of cells to another location - is one of the most commonly used and, at times, most frustrating commands. The problems arise when determining whether or not cell references contained within the formulae in the cells to be copied should be altered in proportion to the distance moved in the copying operation. Where cell references are updated during copying this is known as Relative cell referencing, preserving the cell references is called Absolute referencing.

For those not familiar with spreadsheets, here is a very simple example of replication at work.

Cell A1 contains the number 2.5. The cell B1 contains the formula A1*5, that is: the contents of cell A1 multiplied by 5. (Normally on the spreadsheet you would see the answer (12.5) rather than the formul

UPDATE LOGISTIX UPDATE

```
        A       B       C
1 .....2.5 ....A1*5 ....
2 ......................
```

Let's assume that for some reason you wanted to copy the formula in cell B1 to cells C1 and B2; the result with Absolute replication would be:

```
        A       B       C
1 .....2.5 ....A1*5 ..A1*5
2 ............A1*5
```

Relative replication would give the result:

```
        A       B       C
1 .....2.5 ....A1*5 ..B1*5
2 ............A2*5
```

In this example, Relative replication may seem a rather useless function, but in practice it is the more commonly used of the two because the relationships within blocks of cells are often more important than their exact position on the worksheet.

Logistix uses upper and lower case letters to determine whether or not a cell reference is Relative or Absolute. Since the upgrade, Logistix offers four replication options: Adjust All Cell References (Relative), Do Not Adjust Cell References (Absolute), Adjust Lower Case Cell References Only and Adjust Upper Cell References Only. For even more control there is the option to Preserve Cell Case After Replication or Change To Upper Case After Replication, so that a reference can start relative but automatically become absolute after copying. I know of no other spreadsheet for the Atari ST which gives a greater degree of control over the copying process.

The Move command has also been improved, with the addition of the option to move a block of cells to a specified location. Previously, as with most other spreadsheets, it was only possible to move whole rows or columns.

Other Improvements

Speed - The internal calculations software of Logistix has been improved in this version, having the effect of speeding up the whole program.

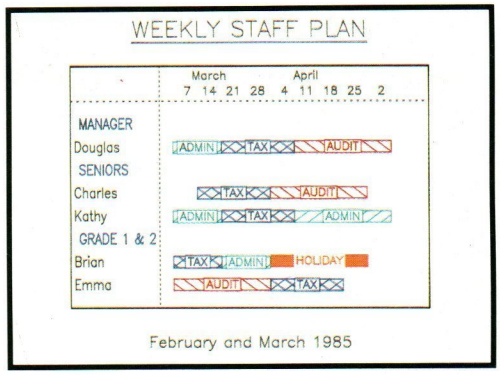
Output - Logistix can now output to the printer a list of the expressions and formulae used in the worksheet, this is very useful for tracing errors or problems within the sheet.

Numerous new printer drivers are supplied in this upgrade. Logistix always supported a large number of printers but now support is provided for 24-pin printers including NEC P6/7 and Epson LQ-2500.

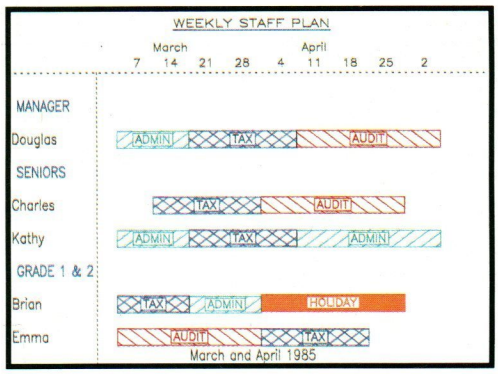
Joining Sheets - Logistix allows data from other Logistix files to be incorporated into data in the current sheet. Previously there were options to either Overwrite data in the cell containing the formula or to Add it to the existing data. Two new options allow the data to be Subtracted from existing data or to br Proportioned to it.

Lookup - The facility for specifying an Offset has been added to the Lookup functions. This is to make the function compatible with the Lotus file format.

Graphing - The Gannt chart (often used for Time Management) layout has been much improved with the option to enlarge the graph area within the frame.



Original Layout



New Enlarged Graph Area

Conclusion

Logistix always was an excellent product, now it is even better. If you use the package a lot, then this upgrade will be well worth the £28.75 cost.

I have one request for the future: when Grafox undertake a major reworking of Logistix, I hope that use will be made of the mouse in the graphing section of the program; this would be a great improvement and would make use of one of the ST's strongest features.

END

Product: .....Logistix
Version: 1.1
Price:.....£115 inc VAT
Upgrade: .£ 28.75 inc VAT
Publisher: .....Grafox
Telephone: ...01-922 8807

PROGRAMMER'S CLINIC

In Richard Seel's Clinic this month there are structures, random numbers, buffered sound, a customized desktop, window updates, and much more. Come and 'C' - Can he Continue the Corny Cliches Concerning C?

Welcome to the thirteenth issue of Programmers' Clinic. The last Clinic Contained a Couple of Complaints Concerning the Comparative lack of C in ST World. The Current Clinic Contains Quantities of C. Consequently, I Contemplate Correspondence from Crowds of BASIC Colleagues Complaining about a Conspiracy to Commandeer this Column! (I 'C' what you mean - Ed).

However, the same principle applies to C as it does to BASIC or assembler: the contributions printed are a reflection of the contributions received.

Structures in C

In issue 30, G Cap asked for an explanation of 'structures' in C. Lots of people have written in with helpful explanations, including Steve Briant of Crewe, Yuk-Lun Wong of London NW6, Alan Green of London N17, Lloyd Patton of Coventry, and David Gristwood of Sunderland (and also ST World!). Many of them have pointed out that other languages have similar data types (the RECORD in Pascal, for instance). The most comprehensive explanation was from Spencer Collyer of Rugby, Warwickshire. Since he also essays a look at 'pointers' and 'linked lists', I have decided to print his account in full.

Basically, structures allow you to keep related sets of information collected together neatly, without having to worry about remembering what is included in the set. Consider, for instance, the example of a bookshop. This shop wants to computerize its stock lists and decides that the information it needs to keep track of for each book is the author, title, price, and number in stock. The obvious way to store this information - and the only way if working in a language which does not support anything more complex than arrays - would be to set up four arrays (assuming a maximum of 1000 titles):

```
char author[1000][50];
char title[1000][200];
float price[1000];
int ninstock[1000];
```

(To those experienced C programmers who are crying out at my use of two-dimensional arrays instead of arrays of pointers, I am just trying to keep this as simple as possible.)

Now this may look like a perfectly reasonable arrangement, but it does mean that any time you wish to operate on all the data for a particular book - for instance, in a sort routine - you have to remember to operate on all the arrays together, otherwise the data will get out of sync from one array to the next. Also, the arrays themselves have no direct relationship to one another - there is no obvious link between, say, author[23] and title[23].

A much more elegant solution, if it is available to you, is to use an array of structures; declared, for instance, like this:

```
struct bookdata{
   char author[50];
   char title[200];
   float price;
   int nrinstock;
   }BOOKS[1000];
```

Now, every time you refer to an array element, such as BOOKS[23], then you will be effectively referring to all the data about that book. If you wish to access a particular member of a structure, use the "." operator. Thus BOOKS[23].price will give you the price of the book held in the 23rd element of the BOOKS array.

Thus far, it is hopefully apparent that structures can be programmed around by the use of arrays. However, the use of arrays of structures is not that common - in fact, probably their chief use is in making the programming of linked lists and related structures, such as, trees and queues much easier. As linked lists involve that other staple of C programming, the pointer, I will now attempt to describe them. Once more, this information applies just as easily to Pascal as to C - I have used it for a major project in linked list processing at university which was written entirely in Pascal, so I know it works.

Linked lists often put people off because of the simple fact that they utilise pointers to access each member, rather than a nice, easy-to-understand, subscript such as arrays utilise. However,

pointers are really no harder to understand than subscripts, and indeed work in a similar way. For instance, if A[5] holds the value '76', and the variable arrsub holds the value '5', then the expression A[arrsub] returns the value '76' - i.e., the value in A[5]. in the same way, a pointer allows you to access the value held in a memory location, the address of the location being held in the pointer.

But let us return to linked lists. The chief advantages which linked lists have over arrays is size and speed of processing. Firstly, linked lists can be any size required by the application, going as big as memory allows. More importantly, if properly handled, they only take up as much space as is necessary.

The reason for this is simply that, when the program needs to add an element to a linked list, it asks the operating system for enough memory to create one, and providing there is enough memory left, the operating system will oblige, generally passing back the address of the allocated memory.

When a program no longer needs an element of a linked list, it can tell the operating system, which will then 'free' the memory for general use again. (Experienced programmers will again have realised that this is a simplified explanation, but it will do for now.)

Arrays are different because, unless you are using a language which supports full dynamic array manipulation, they generally have a fixed size, which has to be the maximum size expected to be needed, and thus will either waste large amounts of memory which are doing nothing, or will exceed its array bounds and crash!

As for speed of operation, since linked lists are constructed using pointers to blocks of memory, if you wish to add, move, or delete an element of a linked list you will generally only have to alter the values of two pointers, rather than actually shift memory around.

Take, for instance, the case where you wish to add an element to a linked list, which already has 100 elements, and the new element is to go in the third place in the list. All you have to do is to alter the link pointer of the second element so that it points to the new third element, and arrange the new element's link pointer to point to the old third element - which thus becomes the fourth element. With just two memory operations you have placed a new element into the list.

Now compare the same operation on an array. Before you can insert the new third element, you must shift by one all 98 elements from position three upwards - and this assumes that you have space in the array for the new element! Deletions and movements (for instance, to sort the array) are similarly economical when using linked lists.

Having discussed linked lists, how do we implement them using structures? Firstly, the good thing about structures in this context is that, in order to be useful, a linked list element needs at least two members, viz the data contained in the element, and also a pointer to the next element in the list. These must always be associated, and structures provide the ideal means of doing this. Thus, if you wanted to implement the trivial case of a linked list of integers, you might use a structure looking like:

```
struct element{
int number; /* num stored in element */
  struct element *next;
   /* point to next element in list */
   };
```

Obviously many linked lists would have more complex elements than this, but it does serve as an example.

```
/*  Listing one   */
/*        C       */
/*   Alan Green   */
/* Random numbers */

main()
{
int x:              /* current prn
int first;          /* 1st prn for repetition check */
int a,c,m;          /* 'for' loop values */

/* get values for consts */

printf("enter values for a c & m :");
scanf("%d%d%d",&a,&c,&m);

/*get first value */
printf(\nenter seed :");
scanf("%d",&x);

/*ask how many numbers to be generated */
printf(\nhow many numbers?:");
scanf("%d",&imax);

/* loop to produce prns */
for (i=0; i<imax; ++i){
  x = (a*x + c)%m;
  if( i==0) first = x:
  if(i%8==0) printf("\n");
  printf("%08d ",x);
  if ((x==first) && (i!=0){
    printf("\n loop detected with i=%",i);
    break; /* well, it's better than exit()! */
  }
}

/* sign off */
printf("\n That's All Folks!\n");

/*  Listing two    */
/*        C        */
/*  Yuk-Lun Wong   */
/*  fscanf() demo  */

FILE *fd;
int n, num;
char fname[]="a:\\test.dat";

fd = fopen(fname,"r");

while ((n = fscanf(fd, "%d", &num)) != EOF)
  if (!n) /* n==0 means no match */
    fprintf(stderr, "Illegal character in input\n");
  else
    printf("%d",num);

fclose(fd);


/*  Listing three  */
/*        C        */
/*   Alan Green    */
/*  fgetc() demo   */

#include <stdio.h>

main(argc,argv)
int argc;
char *argv[];

{
  int number;           /* for result */
  int pos, i;           /* for counters */
  char ch, string[128]; /* for input */
  FILE *fp;             /* pointer to input file */

  if((fp=fopen(argv[1],"r"))==NULL){
```

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SH205 20Mb hard disk	£449.00
Mega-file 30Mb hard disk	£539.00
Triangle Turbo hard disk 20MB	£479.00
Triangle Turbo hard disk 40MB	£669.00
Mega ST2 special offer package - includes: Mega ST2, mono monitor, SLM804 laser printer, 'Microsoft Write', 'VIP Professional', 'Timeworks DTP' and 90 days on site maintenance for only	£1795.00
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Philips CM8833 colour monitor with ST cable	£279.00
Philips CM8852 as above, higher resolution	£299.00
(Extra £10.00 discount on Philips monitors if bought with an ST)	
Philips TV Tuner AV7300, use with composite monitors	£74.95
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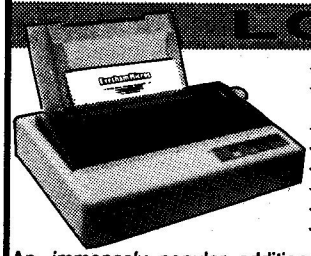

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Now say you have a linked list of 'element' structures set up, and you wish to insert a new element at the nth position in the list. A simple piece of pseudo-code to implement this might be:

```
find(n-1)th element of list;
get memory for new_element;
set (n-1).next to point to new_element;
set new_element.next to point to old nth
element;
```

which might translate in C as:

```
#define NEW(x,num) (x*)calloc((num),sizeof(x))
struct element *p, *q, *r;
/* pass element n to routine */
p=head-lst;
/* head_lst always points to head of list */
for(i = 0; i < n - 1; i++)
p=p->next;
/* move on to next structure in list */
q = NEW(struct element, 1);
r = p->next;
/* save old nth element address */
p->next = q;
/* link in new element */
q->next = r;
/* make sure list continues with old nth elmt */
```

This code is by no means perfect - we don't check to make sure the calloc() call actually allocated the memory, for instance, but it does serve to illustrate the point. The NEW macro is just a simple method I use to save writing out the whole calloc call every time, and ensure that it is correct - Pascal already provides a NEW function which does essentially the same job.

As for providing linked lists without resorting to structures, again it should be possible to use arrays to simulate them, but it would be a tedious task, and also would tend to cancel out the very advantages that linked lists offer over arrays in the first place, quite apart from the sheer complexity of even a reasonable implementation.

Thank you, Spencer, for that explanation. I hope that it will not only make structures a little clearer for G Cap, but also has shed light on some other interesting programming areas.

Random numbers in C

G Cap also asked about using random numbers in GST C. Alan Green of London N17 points out that most C compilers include a library function to produce pseudo-random numbers (he also reminds us that computers do not produce true random numbers - "with the possible exception of my phone bill!".)

But although GST C does not include a random number library function, random numbers can be generated. A typical pseudo-random number (prn) generator would use an expression, such as,

```
xi+1 = (axi+c)mod(m)   (0 <= xi <= m)
```

Listing two shows a C implementation of such a generator. Alan points out that the loop trap is overly-simplistic (he suggests trying a = 12, m = 144, c = 0 with any seed to demonstrate), but the principle is clear.

Yuk-Lun Wong (or should I write Wong Yuk-Lun?) also wrote to suggest using this 'multiplicative congruential' method of calculating random numbers. He suggests that a = 2416, m = 1771875, c = 374441 would be a suitable choice for a 32 bit machine such as the ST (he got these numbers from *Numerical Recipes:*

```
    printf("cannot open file %s\n",argv[1]);
    exit(1);
  }

  /* fill string with <end of string> marks
     and set position to end of string */
  for(i=0; i<128; ++i) string[i]='\0'
  pos = 0;

  while((ch = fgetc(fp)) != EOF)
  if((ch>47) && (ch<58)){
    /* process digit */
    string[pos++] = ch;
  }
  else{
    /* process non-digit */
    if(pos > 0){
      /* end of digit string */
      number = atoi(string);
      for(i=0; i<pos; i++)string[i]='\0';
      pos = 0;
      printf("%6d\n",number);
    }
    /* else ignore */
  }

  printf(" End of File %s\n,argv[1];
}

\* Listing four */
\* Fast BASIC assembler*/
\* wind_update */
\* Martyn Armitage */

RESERVE code,$80
FOR pass = 1 TO 2
[
          OPT pass,"L-W-"       \ turn listing &
          ORG code              \ warnings off

\ initialise TRAP 2 vector
entry     LEA set_vec(PC),A0    \ address of routine
          BSR     chg_vec       \ execute in supervisor
          RTS

\ get address of INT_OUT array
get_array MOVE.L  intout(PC),D0
          RTS

\ New trap 2 routine
new_vec CMP.W   #$C8,D0         \ GEM call ?
        BNE.S   new_vec_e       \ no
        MOVEM.L D0-D7/A1-A6,-(SP) \ save registers
        MOVE.L  D1,A0           \ get AES params address
        MOVE.L  (A0),A1         \ get address of
                                  \ CONTROL array
        CMP.W   #107,(A1)       \ STARTUPDATE ?
        BNE.S   new_vec1        \ no
        MOVE.L  12(A0),A1       \ get address of
                                \ INT_OUT array
        LEA     intout(PC),A0   \ get storage address
        MOVE.L  A1,(A0)         \ save INT_OUT address
        LEA     rst_vec(PC),A0  \ address of routine
        BSR     chg_vec         \ execute in SUPERVISOR

new_vec1  MOVEM.L (SP)+,D0-D7/A1-A6 \ restore registers

new_vec_e MOVE.L  vec_sto(PC),A0  \ get old TRAP 2 vector
          JMP     (A0)            \ jump to it

\ change the TRAP 2 vector
chg_vec   MOVE.L  A0,-(SP)        \ pass routine address
          MOVE.W  #38,-(SP)       \ SUPEXEC
          TRAP    #14             \ execute the routine
          ADDQ.L  #6,SP           \ restore stack
          RTS
```

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The Art of Scientific Programming by Press, Flannery, Teukolsky and Vettering, published by Cambridge University Press).

Steve Briant suggests using the ST's built-in random number generator with an xbios(17) function call. This returns a 24 bit pseudo random number, and a different seed is created every time the computer is turned on. Unfortunately, GST C does not have any bindings to the xbios library, so this solution will not work. As David Gristwood points out, GST C is best thought of as an introduction to the language. If you are interested in going further it is really necessary to buy one of the full 'grown up' implementations available for the ST.

ASCII files in C

Another C query also brought a good post bag. In issue 30 Paul Bartram told us about his difficulty in reading numbers from an ASCII file output by a spreadsheet. He tried using the fscanf() function, but found that it would not detect an EOF (end of file) marker. So then he tried using fgets(), but this only worked if there was just one number per line of text in the file.

Gary Porter of Bradford joined Steve Briant, Alan Green, Spencer Collyer and Yuk-Lun Wong in offering suggestions to help Paul. There is a general concensus that the reason fscanf() didn't work is that there must have been some non-numeric characters in the file; Yuk-Lun suggests the possibility of a control-Z at the end of the file. This will not be seen on screen, but will still manage to cause the problem Paul is having.

Alan Green gives a graphic example of what might go wrong. He used fscanf() with the following file, and had no problem:

```
111
22
3    4444

55
```

The 'white space' was ignored and EOF was found, but this file fooled it:

```
111
22
3    4444

55
end
```

It is the presence of the non-numeric 'end' which causes the problem: fscanf refuses to recognize it, and keeps ploughing on past the EOF.

Two basic solutions were offered: either to use fscanf() and validate the input, or to use fgets() [or fgetc()] but use a different function from atoi to do the conversion work.

Yuk-Lun points out that fscanf() returns the number of items read (zero if no match) or the EOF if the data stream is exhausted. He offered listing two as an example. Yuk-Lun also pointed out a typographical error in the listing in issue 30. The line:

```
char fname[]="a:\test.dat"
```

in Paul's letter should have read:

```
\ make TRAP 2 vector point to our routine
set_vec  LEA     vec_sto(PC),A0  \ address to save vector
         MOVE.L  $88,(A0)        \ save TRAP 2 vector
         LEA     new_vec(PC),A0  \ get new routine address
         MOVE.L  A0,$88          \ set TRAP 2 vector
         RTS

\ restore the original TRAP 2 vector
rst_vec  MOVE.L  vec_sto(PC),$88 \ restore TRAP 2 vector
          RTS

\ storage area
vec_sto   DC.L    0              \ storage for TRAP 2 vector
intout    DC.L    0              \ storage for INT_OUT array
]
NEXT

\ change TRAP 2 vector, install our code
CALL entry
\ make a GEM call, use BEGINUPDATE
\ because our code is expecting it
BEGINUPDATE
\ turn UPDATE off
ENDUPDATE
\ clear D0
D0 = 0

\ get INT_OUT address
CALL get_array

\ copy address for future use
int_out = D0

\ ** an example **
\ make a GEM call
BEGINUPDATE

\ int_out(0) usually holds a result so get it
gem_result =  PEEK(int_out)*256 + PEEK(int_out+1)
\ none zero = OK in this case no menu on screen
PRINT gem_result

\ turn off the update
ENDUPDATE


\* Listing five */
\* DevpacST assembler*/
\* Desktop strings */
\* J Murray Edwards */


start
    clr.l   -(sp)        Go to supervisor mode because we
    move.w  #$20,-(sp)   are accessing system locations
    trap    31           Call gemdos
    add.l   #6,sp        We are now in supervisor mode
    move.l  ($2c),a6     Put the base address in a6
    add.l   #$2de4,a6    Now add offset for 'desk'
    move.l  #dtast,a5    Address of replacement data
    move.l  #5,d6        Six bytes to copy - 1
lp  move.b  (a5)+,(a6)+  Copy data 1 byte at a time
    dbra    d6,lp        Have we finished yet?
    move.l  d0,-(sp)     Finished, so return to user mode
    move.w  #$20,-(sp)
    trap    #1           Call gemdos
    add.l   #6,sp        Now in user mode

    clr.w   -(sp)        Now exit to desktop
    trap    #1           Call gemdos - bye.
    dtast  dc.b  $20,$20,$0e,$0f,$bf,$20  new menu string

       even
       end
```

```
char fname[]="a:\\test.dat"
```

because \t is interpreted as a tab character in a C string.

As an example of the other approach, I have included a listing (listing three) from Alan Green.

Sound sense?

Matthew Pyne of Eversholt, Milton Keynes, and Mathew Lodge of Northwich, Cheshire have both responded to Mr S Bradshaw's queries about the ST's sound capabilities. Unfortunately, they don't agree! Matthew (with two 't's) says that the xbios call dosound is not buffered, and has sent me a buffered routine in assembler to take over its function, while Mathew (with one 't') claims that it is buffered, and provides an explanation of how to use it!

The xbios call 32 (dosound) needs a pointer to the address of a buffer containing a list of sound commands. According to Mathew Lodge, timer C of the MFP (multi-function peripheral) has two functions. This timer runs at 200 Hertz (cycles per second). Its main function is to handle the keyboard auto-repeat, but every fourth interrupt (that is every fiftieth of a second) it does sound processing by looking at the next command in the sound buffer and executing it. Details of these commands can be found in *Atari ST Internals*.

Window updates

In issue 29 Martyn Armitage suggested a way of updating a window in answer to an earlier query from Marcus Marr. I pointed out that Martyn's solution would not work because Fast BASIC does not return a value when it does a wind_update call. This is actually a common feature of Fast BASIC and one of the things that rather spoils its otherwise very friendly GEM access.

In response to these comments, Martyn has provided listing four, which can be used to access the GEM intout array from Fast BASIC. The program works by making the TRAP 2 vector, through which all GEM calls are made, point to a piece of code that gets the address of the AES parameter block used by Fast BASIC, from which the address of the intout array can be obtained.

Once the code has been assembled it is installed with the line:

```
CALL entry
```

which simply saves the normal TRAP 2 vector and replaces it with the address of the new routine. Martyn has included a number of (possibly unncessary) checks in his code because, "Working with GEM has taught me not to trust it". With suitable modification, this approach can be used with other GEM calls which return a value.

Line A seed fill

Nigel Thomas of Kings Lynn, Norfolk, has some information on the undocumented line A routine which Julian Wilkinson wanted to use in issue 27 - $A00F, seed fill. It appears that there is a reference to this routine in "The Concise Programmers' Guide" by `Katherine Peel', as well as mention of something called an 'abort fill routine pointer'. However, there is no other information given, so Nigel began to prod around in his ROMs with a memory editor and found the missing line A routine. He also found out why it isn't documented - it doesn't work!

The routine itself exists in memory at $FD11C2 on my machine, and inputs are as per the following list:

```
PTSIN(0)  X coordinate of seed
PTSIN(1)  Y coordinate of seed
INTIN(0)  Colour to fill with?
```

The last one is a bit confused, mainly because the routine uses lots of variable addresses which are not documented either, but this is what it appears to do.

The call to $A00F will actually fill one line of the screen, or polygon, until both ends reach the edge of the screen or polygon. Then it goes wrong by calling the aforementioned abort fill routine from offset $76. This vector is actually set to zero in the A line table and so sends the program off to execute the exception vector table, bombing out with four bombs on the instruction 08 FC 0A 1A, which is the privilege violation vector as well as being an illegal instruction.

The only way to make it work would be to enter the address of the abort routine oneself into the A line table - if only I could find out what it is. Never fear, I am still looking for it and will tell all if I find it.

As an aside, did you know that the call $A000, which is supposed to be an initialization routine, doesn't initialize anything? It just puts $0000293A into D0 and A0, and $00F09006 and $00F09C86 into A1 and A2 respectively. All the initialization is done by TOS at boot up. So that is where it has gone wrong. No wonder it is not documented.

Nigel also has some thoughts on the question of undocumented calls and locations. He recalls that so many CP/M programmers accessed the BDOS and BIOS jump tables that in the end Digital Research published much fuller documentation and left them to get on with it!

I see nothing wrong in doing undocumented things as long as you are aware of what you are doing. The argument that it may not work with future versions of TOS is perfectly correct, but it does sometimes make future versions more consistent, which is to the programmer's advantage.

Anyway, I never got away from 'quick and dirty' programming in the first place. Mine may not always be quick, but it certainly is dirty at times.

Simon Walker of Milton Keynes also has something to say on the subject of 'proper' programming. It was Simon who sent in the 'PEEK' solution to GFA joystick programming to which Mathew Lodge objected in issue 29. Simon's riposte is as follows:

Now I'll be the first to admit that Frank Ostrowski's method is the more desirable, but when I needed a joystick handler routine for a program the PEEK was the only method I knew. I could either have used the PEEK or shelved the program until a better method appeared. Obviously I chose to get on with my program, using the method available. Presumably Mathew Lodge would have abandoned the program.

This kind of 'holier-than-thou' attitude takes all the fun out of home computer programming. I spend all day programming 'in an approved manner'; at home I relax a bit. I agree with your attitude - print it, and leave people to make up their own minds.

DIY desktop

Another reader who is prepared to take the risk of using undocumented addresses is J Murray Edwards of Lennoxtown, Glasgow. He has sent in a listing which 'customizes' the desktop display. It is run at boot time and works by altering the strings in the desktop's object tree file which are held in ROM, but copied down into RAM at bootup. Since the program uses an absolute value as an offset, rather than a pointer, there is no guarantee that it will work on all operating system versions.

According to Mr Murray Edwards, on the old OS the strings can be found by using the address found at $2C and adding the appropriate offset. This is $2DE4 for "Desk". Listing five rewrites this with the Atari symbol and the trade mark symbol, padding out with spaces. If you do this, ensure that you don't use a string longer than the original - otherwise you could get some 'interesting' effects.

Quick queries

M A Belton of Hawkesley, Birmingham, programs in assembler. He or she wants to know how to switch resolution within a program. The trap #13 routines "seem flawed".

Lewis Childs of Bordon, Hants, also uses assembler. Although he is able to do some fairly complicated things, he finds that almost every time he does an RTS from a subroutine he gets a bus error. Why? He is also attempting to write a program using sprites in assembler:

It works fine while I am moving a single sprite around the screen, but as soon as I put two sprites side by side to make a larger one and move them both together, one sprite is not erased and so I end up with bits of that sprite all over the screen. Strangely, this does not happen if one sprite is beneath the other. I am using line A call $A00D to draw the sprites and line A call $A00C to erase them. Please help...

Simon Walker uses GFA BASIC. He wants to perform a software reset, determine which ROM version is present from within a program, and use the AES application library routines.

Finally, Mathew Lodge has a sound problem:
I have built myself a small eight bit resolution ADC and DAC (analogue-to-digital/digital-to-analogue convertor) which is connected to the parallel port of my ST. I have written sample, display and playback software which works very well with the DAC on the board. However, I have had problems playing the sound back through the monitor.

I have a small program which calculates four bit logarithms to base two of all the eight bit amplitudes in a 300k sample. I then feed these values through the PSG (programmable sound generator) to play back the samples. I use an amplitude modulation method, where the channel B tone generator is turned on and no wave selected.

The four bit log values are fed through as the amplitude (volume) of channel B to play back the sample. This produces a very quiet playback. I have to turn up the monitor speaker fully to hear only a quiet rendition. Obviously I'm doing something wrong, since games such as Goldrunner have no problems in this department. Can anyone please help?

DESKTOP.INF

Finally, another query about the DESKTOP.INF file - where is it? Les Kneeling of Ilford in Essex has written a desk accessory which is intended to supplement or replace the Atari-supplied CONTROL.ACC (figures one and two). It allows you to perform some DOS activities while in any GEM program (being able to format a disk or rename a file have both been useful to me).

However, Les has had difficulty finding the DESKTOP.INF file in memory. Apparently there are several copies between $7000 and $93B6, but the locations vary with the OS version. Les's solution was to look for the first occurrence of "#a" and "#b" at the right spacing for a DESKTOP.INF file. It seems to work, but it isn't entirely satisfactory.

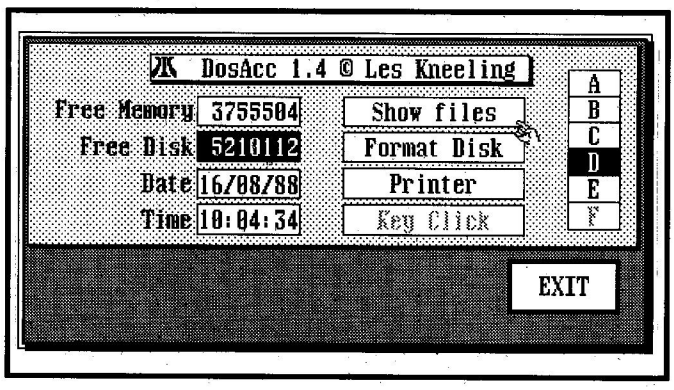
Les reckons that there must be a vector to the file since the control panel can cope with different versions of the operating system. Can anybody shed any light on this problem?

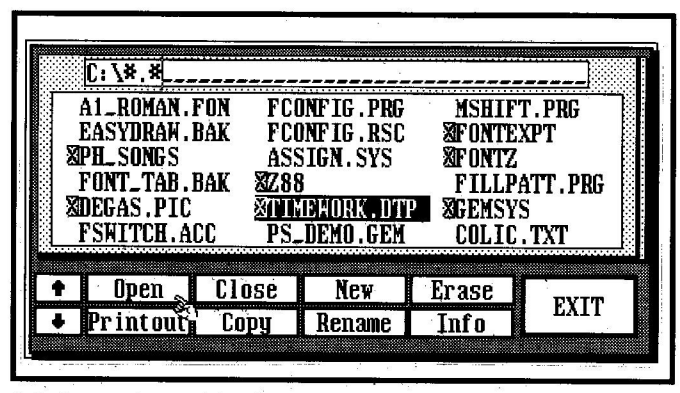
Incidentally, Les has sent copies of his program to a number of public domain libraries, but has received no interest or even response from them. Not surprisingly, he is a little upset!

That's it for this month. If I haven't managed to get round to your letter yet, please be patient - it will be two months or more before it gets into print. Some contributions may have to wait much longer; I have to try to get a good mix of topics, and it may be better to keep yours for another issue. Please don't write and ask for individual replies; I haven't got time to deal with them, and I don't want to disappoint you.

Thank you all very much for your support. Keep the letters rolling in - especially the solutions and comments on other people's problems and ideas. Please remember to include your full name (or title, if preferred) and phone number if possible. If you have a listing please include it on a disk - if you want the disk or listing back, also include a stamped addressed envelope. END

Write to me at:
Richard Seel,
80 Windermere Road,
Ealing, London, W5 4TD,
United Kingdom.





Figures 1 and 2, Les Kneeling's DOS functions desktop accessory.

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AUGUR OCR

The much acclaimed Augur Optical Character Recognition system from Signa Publishing Systems is now available. Ian Divers assesses this low-cost solution to Professional OCR.

Mention OCR (Optical Character Recognition) and most people look blank. Very simply, it is the ability to scan a textual document electronically, look at the images it produces via a computer which then turns the image back into a stream of data which can then be read by a computer.

How does it work?

The most common method is to pass the paper over a bright light source and use an array of photo-diodes to produce voltages to represent the levels of reflected light. These levels (voltages) are converted into digital data, 1's and 0's - effectively pixel on (1 = black) and off (0 = white). This is important to understand as when text is being scanned (as opposed to graphics) the interest is to achieve the crispest contrast to give the recognition part of the system the best possible chance of accuracy. So a character will now consist of black pixels surrounded by white, depending on the shape of the character itself. Shapes are then placed into buffers ready for recognition. Traditionally, recognition has been achieved by some very complex software which understands the topology of a character - in other words, precise shapes and thier characteristics. Shapes in the buffer are then compared against a library so that a match can be found. When a match is found, an ASCII character is placed against its relevent shape and the data stream is thus created. In cases where a match cannot be found, a preset character (such as an asterisk) will be placed in that shape's position so that the user can later replace the asterisk with the correct character. Until now, this topology method has been employed as it is easier to use, rather than looking at both the shape and the pixels which make it up. Additionally, OCR has, until now, had very tight specefications as to which fonts may be used, hence the creation of the OCR B font, probably the most popular in this application.

Today's technology has changed all that. Thanks to high speed processing, shapes and pixel content are a viable alternative to the topology method of working, and it is this principle on which Augur is based.

The speed of modern electronics is such that nowadays, this can all be achieved at high speed. However, it is at the stage of actual recognition that the problems really start to manifest themselves and this is where most companies try to produce their own leading edge in the market. The success rate very largely depends on the accuracy and quality of the original document. OCR can only be expected to work reliably with consistent typeset, typewritten or printed documents on good clean paper. If you crease the document, spill coffee on it, or if the signature intrudes into the scanning area, it will all add to the information that is read and has to be analysed.

> *"Thanks to high speed processing, shapes and pixel content are a viable alternative to the topology method of working, and it is this principle on which Augur is based."*

Looking at these sheets, your eyes and brain will automatically compensate for all but the most glaring errors. Machines are not so forgiving. What they see is what they work on; they pick up every tiny little foible. To obtain similar results from the two typewriters requires a lot of processor and software power. By using the topology method, on a standard font, some of the variations caused by machine tolerances / ribbons can be catered for more easily. Perhaps, if the print was uniformly faint you would possibly miss pieces out of some features and the software might fail to identify a few of the characters or even substitute incorrect ones. Darker print can be simulated by increasing the amplifier gain (contrast / brightness control), however, you then run the risk of picking up splashes of ink, random marks on the paper and even creases in the document. Plus, if you did read the faint page, the next normal documents would appear to be very heavy (fuzzy at the edges) and you would then have 8's turning into B's or 0's etc.

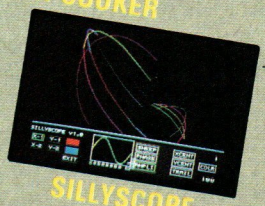
Trying to recognize an entire alpha-numeric font is much more difficult than a straight numeric font. For a start, there are fifty-two more characters plus punctuation symbols to check against in the library. On top of this, symbols like 1 and l, 0 and O, 8 and B are all prime candidates for confusion or substitution. All software has very complicated algorithms to try and identify each shape correctly or at least highlight any symbol that it cannot recognise. The very worst failure is if the software allows a substitute character. Imagine your account being credited with £5000.00 instead of £6000.00. You should be aware of OCR and its problems because most cheques, credits and things like BT, Gas and Electricity bills are all processed using OCR. As you can see, problems with this electronic wizardry are truly amazing.

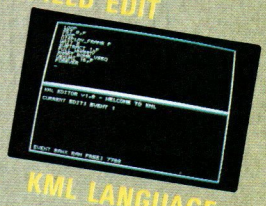
What is Augur?

Augur is software that gives your ST and Hawk scanner the ability to move into OCR at the unbelievably low price of £1000.00 inclusive. It is written by Marvin AG of Zurich and has the same feel as their Scansoft and HJB PaintPlus programs which are supplied with the Hawk. The software takes the scanned bit image of a page and firstly tries to assemble lines from the top, each line being separated from each other by a minimum of one row of continuous horizontal white pixels. Once it knows how many lines there are, it goes back to the top and along each line it tries to differentiate the shapes, each one

Trip-A-Tron

LIGHT SYNTHESISER





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separated from the next by at least one vertical pixel line. At the end of this process it knows how many shapes there are and commences to match each against a library or goes automatically into learn mode. Although slower than some of the dedicated hardware/software solutions, this software-only system is much more flexible. It can very quickly learn virtually any typed or printed font between 6 point and 22 point. It can even cope with a skew of 5mm across an A4 page (about 2.5% which is impressive by itself!). For your money you get: an epoxy and brushed aluminium cartridge that fits almost flush with the outside of the machine, a disk with demo pages plus the associated libraries and, of course, a manual. I have the A4 pre-release version of the manual but by the time this is published the typeset A5 version should be ready. It is not a GEM tutorial but has all the information necessary to run the software successfully without reference to the ST owner's book. There is no index - good idea, it makes you read the manual. This is not the type of program to try and hack your way around; you need to read and understand the explanations, tips and examples.

In use

Starting from scratch you don't have any library information loaded. So firstly you need to scan in a document. I use the function keys wherever possible - it saves time. Looking at the image window (centre), it is impossible to tell anything about what has been captured as the representation is too small. Use the mouse to describe a roughly positioned rubber frame around the text you want to work on. The smaller the area the quicker the results and, of course, there is little point trying to interpret any graphics. Click anywhere in the window and it 'explodes' to fill the whole screen, centred around the area pointed to. After some practice you can tell whether the scan will be of any use for recognition. Check to ensure that the edge of the frame is at least one half line away from any text required. If the band touches any shape on the top line for instance, the process will miss out that line entirely. Adjusting the band is accomplished by using combinations of the shift key and the cursor control pad. Scrolling around the display is as easy as it is smooth by using the mouse. Pressing any button will return you to the normal display. Select precise mode from the text recognition menu. This seems to be the best mode for learning good, clear print. At this point the actual process of recognition can be started.

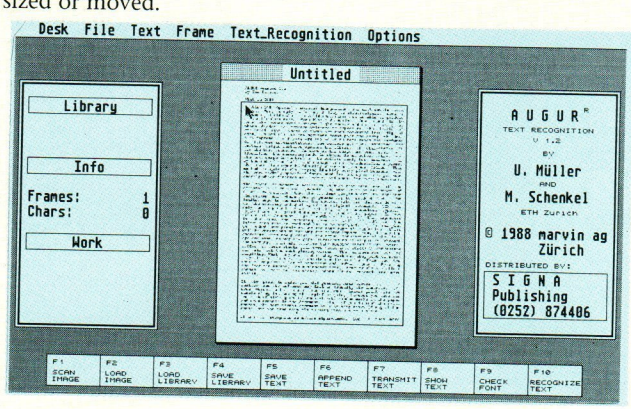
The figures and descriptions show the actual process of scanning, learning and updating an unknown font up to the point of saving the text into a file. The learn mode screen is nicely laid out. The central window shows the enlarged shape including all its blemishes. Above that is a large window showing a wide area around the shape so that a decision about the characters identity can be made in context. At the bottom is the data input window. For characters that cannot be entered from the keyboard there is a character selector box on the left. If you have an omega shape, you can click on the omega in the selector panel to put that ASCII code in the library. The box on the right lists some of the controls available to you in learn mode. Curiously, they show delete but not the space bar. Delete removes extraneous marks. The space bar does the same, but then it inserts an ASCII code for a space. This can be essential for correct text to be produced.

Let us look at the major features, in menu order. Once scanned, a page does not have to be processed immediately. The image could be saved and recalled at any time. This would certainly speed up the turnaround on important or sensitive documents. The format used is .SCN which means that the image can be manipulated by both Scansoft and HJB Paintplus. Libraries can be loaded, altered or updated and saved. The ability to delete files and to format are also incorporated. Formatting is limited to double-sided which is no problem as the cartridge will not physically fit in the socket of a 520ST. Quit brings up an alert box reminding you to save any changed library files or new text that has been recognized.

The text menu can save the text held in memory, or append it to a previously opened file. It even inserts three line

AUGUR OCR

Fig 1. The document has been scanned in and a frame defined. The image is untitled until it has been saved. During recognition sessions of previously saved material this title is an essential. Note that the window is not a GEM window and cannot be sized or moved.



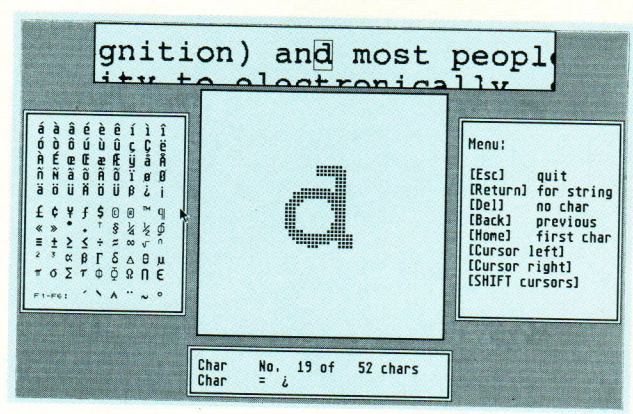


Fig. 3.This is the learn/teach mode. The upside-down question mark is used by Augur to denote an unrecognized shape. The selector shows the untypeable characters. At the bottom of the selector box you can see that some accents can be added by using the function keys in combination with normal typed characters.

Fig. 2. The recognition process has been started. The assembly of the lines is complete and the shapes are now being separated. All the time there are counters incrementing. Nice to be able to see that something is happening.

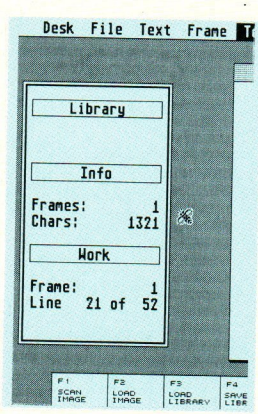
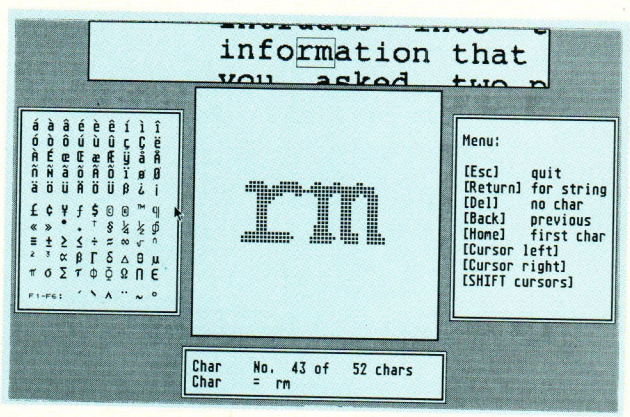


Fig. 4.When shapes run into each other you cannot enter just one character. For the example if an r or an m had been entered, information or any word with an rm combination would be spelt incorrectly. This is overcome by having a string entry facility which is activated and de-activated by pressing return.



spaces between the blocks so the join can be easily found. Showing and clearing the text are obvious. A separate section at the bottom is for selecting either an ASCII or 1st Word Plus format. Marvin have recognised the popularity of 1st Word on the ST and have incorporated this mode to enable direct use of the text in the popular word processor. Transmits usefulness is not immediately obvious. If the RS232 port is set up in EMULATOR.ACC and a modem is on-line, this selection will squirt the raw ASCII down the line. It could be to a remote office, mainframe, publishing house etc. This facility does have some very interesting possibilities.

Frames are mouse operated and up to eight can be defined on any particular document. These can be used to limit recognition to parts of text or to window areas of a form. Recognizing areas on forms would be an ideal way of entering data for research. Set up several ST/Hawk OCR units around the country. Scan in the typed questionnaire responses. ASCII data could then be electronically mailed to the mainframe for analysis. The problem of describing up to eight frames repeatedly, would be horrendous even on a sample of only a few hundred forms. So the authors have included a freeze frames option which means that, once defined, they are held over for each subsequent scan. Providing your forms are accurately reproduced and you scan carefully, even fairly large runs are feasible.

The text recognition menu accesses the recognition process, font checking and text showing facilities. It also allows selection of Augur's focus. Precise mode uses every pixel and this is the normal mode for learning, unless the font is inconsistent or faint. However, for recognition it is the slowest mode. Medium mode is slightly less focused and is quicker. Fast mode is just that. For laser print, the library is taught in precise mode and then recognition should be in fast mode. The selection of the modes is something you get to know through use of the product although useful hints are given in the manual. The final option in this menu switches off the proportional recognition in learn mode. This enables the recognition of shapes like double quotes as such, rather than as two separate characters.

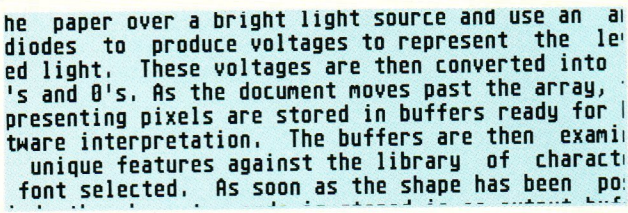
The final menu enables toggling between portrait, the default, and landscape scan formats. In landscape, two pages at a time could be scanned on A5 manuals and by freezing two windows the whole idea of scanning a small book becomes a practical possibility. Last but not least, is italic to upright. Most italic writing is slanted at approximately fourteen degrees. Put a frame around the italics, use this option and it straightens the bit image shapes upright so that it can get the one pixel vertical line separation necessary for assembly. I would have praised this facility but... the software is so good that as of yet it has never failed to recognise the normal italic fonts used.

A library file can be anywhere up to 220Kb in size which equates to approximately 700 shapes in a fairly standard font. At this size, though, the recognition process would be very cumbersome, every shape having to be checked against perhaps several hundred characters before a match could be found. So far, clean fonts appear to produce libraries of between 85 and 130 characters. To test the claimed speeds, a page containing 3703 characters was scanned in. The font was learned in precise mode, then the recognition was run in each of the three modes. Ignoring the seven seconds to assemble the lines, precise came in at 40 characters per second; medium ran at 97 characters per second and fast mode speeds in at 132 characters per second.

Conclusion

The significance of this software should not be underestimated. For the first time it gives small companies the ability to use the many benefits of OCR at an unbelievably low cost. An Augur Mega ST2 with mono monitor and the Hawk scanner would cost roughly £3500.00. This is about 25% of the cost of any system that significantly improves on Augur. As this facility becomes more widely understood and appreciated, new uses will be thought of by a user base which will not know about the constraints associated with traditional OCR environments. If Signa can get the message to the world, the world will certainly beat a path to their door. END

Fig .5. Once the library has been produced an ASCII text file is built in memory and then displayed. If the line extends beyond 80 characters the information is displayed up to column 79 and the last character is displayed. This is purely for display purposes and the actual text is still completely intact in memory. If the text is more than one screen long, pressing the left-hand mouse button should scroll to the next page. This did not work for me, but it is the only problem that has been found so far.



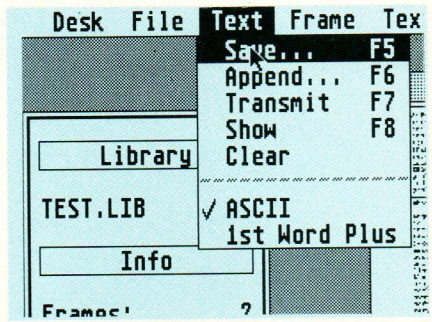


Fig. 9.The default ASCII option has been selected. The file can be saved, shown, appended or transmitted. Before quitting, an alert box will be displayed to remind you to save the new TEST.LIB file as well.

Fig. 8.The next page has been scanned in and two frames defined. The library which was saved as TEST.LIB is there, still in memory, but after recognition of the two new frames, more shapes have been added so there is the new prompt visible again. The 1690 characters are the total number of shapes in both frames.

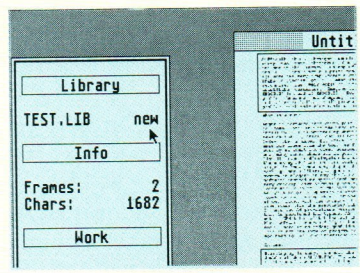
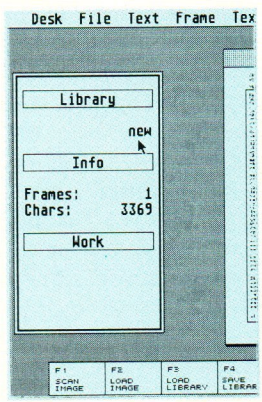


Fig. 6. Back to the main display. The library information section of the current status box says new. This informs you that there are newly defined shapes in memory which have not been saved to disk yet. Info tells you how many shapes have been identified in the selected frame or frames.



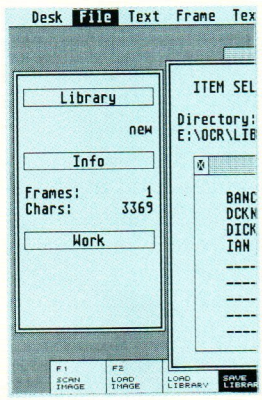


Fig. 7.To save the information into a library file calls up a standard GEM item selector box. You do not need to specify a suffix, the program adds it automatically.

Product: Augur v1.2 OCR s/w
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SCANSOFT

v 2.51

The Hawk scanner as distributed by Signa Publishing was reviewed in issue 24 (February 1988). It seems that it made a good impression with the author. A new revision of the oftware has arrived which corrects several errors and adds a couple of new features as well. To cover old ground is pointless but it may be worth re-reading the original article again to refresh your memory.

Manipulation

Zooming has been improved and the actual format of the zoom size can be altered in the options menu. The default is 640 by 400 which is the Degas PI3 format. By altering the size of the zoom, the integrity of the original image is more likely to be maintained. The zoom window itself only appears when it is required now. This saves memory which is useful if you own a 1040ST.

The image can now be rotated to landscape from the default portrait orientation. It takes approximately 30 seconds to complete the re-drawing but it is worth the wait. This is a feature which is very much appreciated; it was difficult to really appraise some horizontal images before. It was like trying to study the Mona Lisa which had been hung on its side.

Dithering is the latest necessary facility for every DTP package. If you do not have it, nobody will buy the product, even if they do not know what dithering is. It is very simply a set of routines that regroup pixels into patterns which, when zoomed up or down in a DTP package, are less likely to produce blotching or the dreaded tartans. These routines in Scansoft actually work and work very well. A better term for dithering is error diffusion, it gives you an idea what the code is actually trying to do.

Scansoft's offering has 3 sizes (1:1,1:2,1:4) at 32 levels of brightness. This addition is free, but Scansoft are taking dithering much further. Future variations and developments will be sold as optional extras. There is a note in the manual about being careful with the 1:1 dithering option. It is possible to experience a problem called blotching. Having used dithering on most of the photographs that have been scanned in, the blotching problem has still to raise its head. The example in Figure 1 and Figure 2 was scanned in from a rather poor family photograph. Looking at the 1:1 windows you can see the improvement in the dithered image and that being at 1:1. The actual regrouping of pixels can be most easily seen in the two zoom windows. The zoom window in Figure 1 already shows the straight line syndrome before the image is even ported into a DTP package. The other selections of 1:2 and 1:4 do not suffer from any blotching problem. These also have produced excellent results so far.

Output

The Atari SLM804 drivers at 150dpi and 300dpi are now included in the printer folder. The Atari laser can produce a print in 45 seconds which is really impressive going. Where the image to be printed comes from has been changed as well. There is a choice now: not only can the image in the preview window be printed, but if you wish, the contents of the zoom window can be printed instead. Signa now supply a copy of Timeworks DTP free with each Hawk, pity mine was purchased prior to the offer. Anyway, a file called SCANNER.SYS is now included which, if used instead of PRINTER.SYS, enables a Timeworks page to be dumped to the scanner in 10 seconds. It gives a much better idea of what the copy looks like before committing yourself to the production run.

The option to choose between SCN and IMG formats for saving the image to disk has been enhanced. If IMG is selected, and you wish to save in compressed mode, then you can rubber-band the actual portion of the image required. It was one of the annoying features of the previous release that if you saved a compressed

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IMG file it was very likely to be well over 400Kb.

HJB Painplus

Even this excellent package has received attention. The Y and Z keys now function the correct way round for polygon and rubberize. The most significant improvement though, has to be the ability to import IMG files directly, manipulate them and then save them back as IMG files. You can now directly access just about every popular art and image format available on the ST. It is now a formidable art package in its own right!

Conclusion

It is always nice to receive software updates from a supplier, especially if they are free. This upgrade has answered almost every annoyance in the original release and the addendum manual is an improvement on the rather poor original. To date, the only problem discovered is that OCR cannot be accessed from the menu, and that, apparently, will be resolved in the next release. END

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SCANSOFT
v 2.51

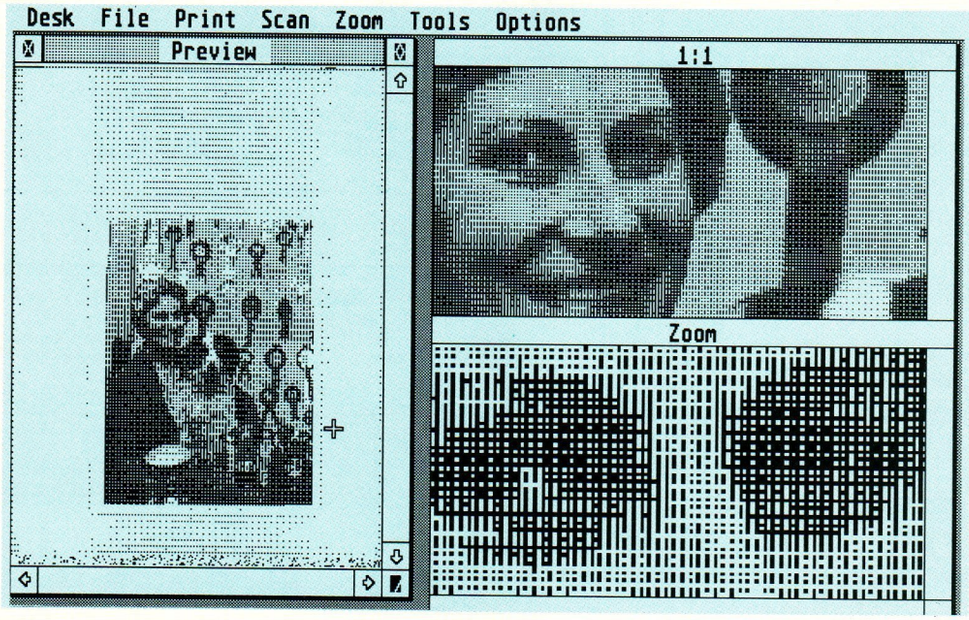

Fig. 1. The photograph has been scanned in. This image is the same one as used for the dithering in figure 2. Notice the preview window shows a reasonable picture but the 1:1 gives a more contrasty or hard image. The zoom window at the bottom shows the eyes as sets of lines. After manipulation these become almost a tartan effect.

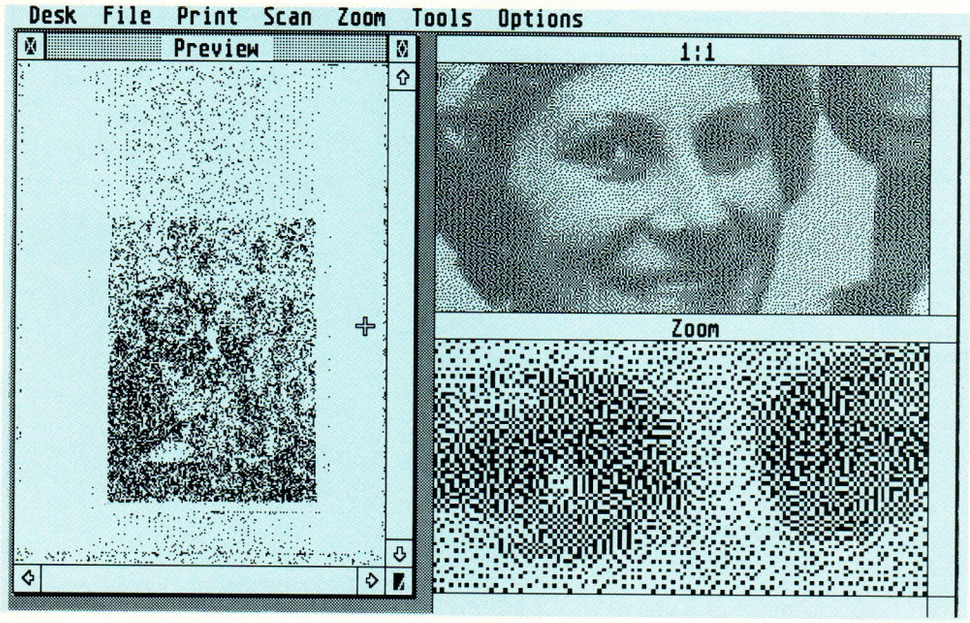

Fig. 2. The same image has now been dithered at 1:1 and the brightness increased by plus four. The preview window looks awful, but look at the improvement in the 1:1 window. The zoom window at the bottom shows how the lines of pixels have been regrouped but still look like the original image.

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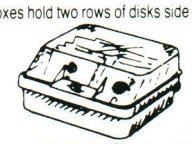

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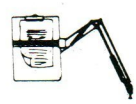

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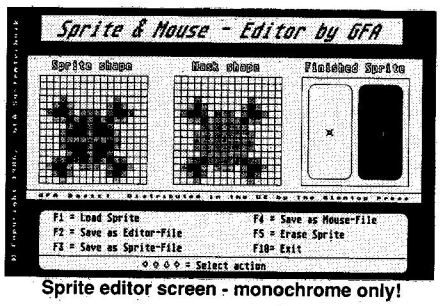
GFA Basic 3

GFA Basic from Glentop, has always been one of the most popular Basic interpreters available for the ST. An upgraded interpreter, Version 3, has recently been released, and because of its versatility, ease of use and increased speed, it is certain to attract old hands and newcomers alike. Alan Springer checks it out.

The package comprises an excellent loose-leaf 500-page manual which is well laid out and easy to use and a disk containing the Interpreter, a Run-Time program and a good selection of example programs and 'segments'. The latter are 46 example programs given in the manual and are cross-referenced to



Sprite editor screen - monochrome only!

it by page number/file title. Also present on the disk is a monochrome sprite editor with example mouse pointer alternatives.

The Interpreter

I estimate that there are in excess of 200 new Basic keywords in the new Interpreter, their functions range from intercepting and interpreting joystick port activity, to providing double precision mathematical calculation of eight byte floating point variables in IEEE format.

Earlier versions' manuals were organised so that all the keywords were arranged alphabetically, but the new manual is set out in a far more helpful and logical manner. Associated keywords are grouped together in chapters with full descriptions, syntax, legal abbreviations, uses and frequent example programs. If, however, the user is unsure where to find a particular command, there is a comprehensive index. The latter feature was omitted from previous manuals.

A good example of the style of the manual is given in the explanation of the previously mentioned joystick port information interception keywords, which, not surprisingly, appears in the chapter headed 'Input and Output'. An example program is given which utilises the keywords STICK, which activates the port reader, STICK(x), where x is the port, 0 or 1 being monitored, STRIG(x), returns the state of the fire button and CASE which, in this context, gives the direction of movement of the joystick in any of its eight possible directions.

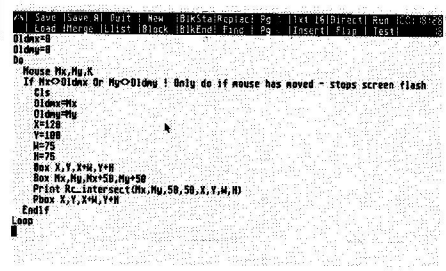
```
! READS JOYSTICK PORT 1
STICK 1
REPEAT
  direction%=STICK(1)
  fire!=STRIG(1)
  SELECT direction%
        CASE 1
              PRINT "up"
        CASE 2
              PRINT "down"
        CASE 8
              PRINT "right"
        CASE 4
              PRINT "left"
  ENDSELECT
UNTIL fire!
! WAITS FOR
! FIRE BUTTON RELEASE
WHILE STRIG(1)
WEND
```

GEM window, event and object handling are now fully supported. For example, commands with the prefix 'GRAF_'are used to define window size and test for mouse pointer activity, e.g. opening, closing, shrinking or enlargement of windows and movement of the horizontal and vertical scroller bars. These commands can be associated with 'WIND_'prefix keywords which perform more fundamental GEM window activities, such as, DELETE, FIND and CREATE. Objects may be defined and monitored on the desktop using prefix 'OBJC_' and 'OB_' commands. It is a simple matter to detect the mouse pointer's presence within, say, a previously defined rectangle's boundary using OBJC_FIND.

Conditional command flexibility has been increased with additions to the IF-ELSE-ENDIF keyword functions such as ELSE-IF and SELECT-CASE. Also the values of variables and the variables themselves can be passed into procedures. Loops of various types, e.g. FOR-NEXT, REPEAT-UNTIL, WHILE-WEND and DO-LOOP which were available in earlier versions are now complemented or superseded by DO-UNTIL, LOOP-UNTIL and LOOP-WHILE.

The Basic Interpreter gives fully-implemented integer arithmetic which increases computational speed and has floating point arithmetic to 13 places of decimal. The effect on average standard Benchmark Times (if you have faith in such things) is an overall improvement of about 25% on earlier versions.

The Interpreter is capable of directly calling Operating System routines, such as GEMDOS, BIOS and



Editor screen with sample of DEFLIST1 indentation of loops in program.

XBIOS. Also Assembler and other languages may be called from within Basic programs with instructions, such as, RCALL, C:MERGE and MONITOR. In

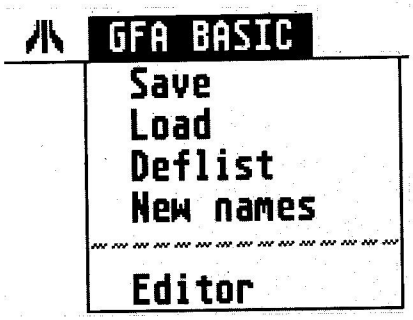
more.....

addition, most VDI and AES functions can be invoked using simple keywords.

Machine memory reservation for specific activities is achieved using the resource library provided, thus enabling the user to employ, for example, the command RSRC_OBFIX to convert the coordinates of a stored object into screen coordinates taking current screen resolution into consideration.

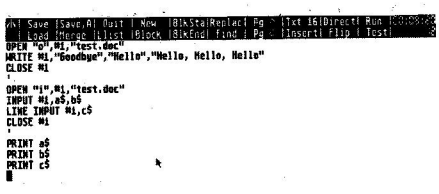
The Editor

The Editor screen of version three is very similar to that of earlier versions. The se-



Editor screen 2 - obtained by clicking on the Atari symbol.

lection bar along the top of the screen contains standard options, such as, filing, ASCII conversion, block and page movement, editor/direct mode toggling and run/test, which may be selected either with the mouse or function keys. The obvious differences are an Atari symbol on the far left and a digital clock and program line counter display on the far right. If the mouse pointer is clicked on the Atari symbol, the screen changes to give a set of GEM pull-down menus, thus giving easy access to any resident desk accessories. There is also an option which allows the user to alter, among other things, the presentation style of the current program using DEFLIST. The default setting of DEFLIST is in-



Editor screen.

dented loops, keywords in upper case and variables in lower case.

In the Editor menu, beneath the Atari symbol is a space for indication that the keyboard caps-lock is engaged (an upward-pointing arrow) and the keyboard's numeric pad has been selected for cursor control (a circumflex).

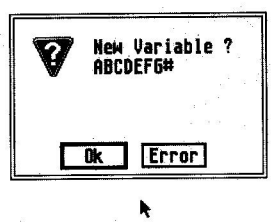
It is more convenient to leave the keyboard input in lower case because, as in earlier versions of the Basic, after a program line has been entered, the Editor not only checks that it is syntactically correct, but also converts any keyword it recognises into upper case automatically. Any redundant spaces within a line are also removed.

As usual, no line numbers need be input and like its predecessors, the Interpreter will only accept one statement per line, except when the command format FUNCTION...ENDPROC is used which enables more powerful functions to be designed.

Short-form keywords are accept-

"My only problem is, that in view of the vast array of commands at my disposal, how can I hope to remember them all?"

able, e.g. 'p' for PRINT etc., in both Editor and Direct modes. In the Editor mode they are automatically converted into their complete form and trans-



Direct screen with variable query box.

posed into upper case. Some care should be exercised in variable name selection, because with 400 plus keywords to choose from, it's fairly easy to confuse the Editor's converter by entering something which is translatable into a command. The Editor is intelligent enough to check inputs for validity while in Direct mode, so if, say, PRINT ABCDEF is entered and the variable 'ABCDEF' does not appear in the program in memory, an alert box appears with the question " New Variable ABCDEF ? OK / ERROR ", if the 'OK' box is clicked, the variable name is stored for subsequent implementation.

Once the program has been entered, it can be modified with the user-controlled editing system.

The 'Numlock' numerical keypad editor controller available on PCs is duplicated by the Editor. The numeric pad becomes the cursor controller by simply pressing CONTROL and the minus key on the pad. The pad's activation is indicated, as mentioned earlier, by the appearance of a circumflex below the Atari symbol on the menu bar.

Earlier versions of the Editor had a great many cursor movement, search and replace/delete and block manipulation facilities. These have been retained and enhanced by the addition of other very useful features. For example, if procedures are used in a program, they can be 'folded' so that only the name of the procedure appears in the listing, thus considerably shortening the listing for clarity. These folded procedures are identified as such by a '>' preceding their names. Unfolding, so that modifications may be performed, is achieved by simply deleting the '>' symbol.

The command DUMP, when used in direct mode, assists in debugging programs by displaying the current values of all or selected variables.

Programs written with version three have the file suffix '.GFA' rather than the '.BAS' of earlier versions. The Interpreter will not recognise a '.BAS' program as Basic, even if the suffix is changed. It is, however, a simple matter to rectify the problem. The early version's ASCII file converter (SAVE,A) is used on the program. Then, using MERGE in the Editor mode of version three, the file can be loaded and is automatically converted to an acceptable format and assigned the suffix '.GFA' when re-saved. It should be noted that the usage of some keywords of earlier versions has been modified and their syntax parameters changed in the latest version, but the manual gives a list of possible problems which could occur and suggests changes which enable the programs to operate correctly.

Comparison with other basics

Earlier versions of GFA Basic had some obvious omissions and restrictions when compared with the other two members of the 'big three' Basics (Fast Basic by Computer Concepts and HiSoft Basic). Equally, with respect to other features, the converse was true. GFA version three has more than filled the shortcomings of its ancestors.

Generally, almost all the functions and facilities which could be reasonably expected of an Interpreter are available (plus some pleasant surprises). When one also considers that earlier versions' speed of execution outstripped those of its competitors and the speed of the new version has been increased, it's difficult to imagine how this product's specification can be improved upon. GFA Basic is fast and comprehensive, and when the V3 compiler arrives towards the end of this year, it will really fly. My only problem is, that in view of the vast array of commands at my disposal, how can I hope to remember them all? END

"When one also considers that earlier versions' speed of execution outstripped those of its competitors and the speed of the new version has been increased, it's difficult to imagine how this product's specification can be improved upon."

Just to complete the picture, we've asked two other experienced Basic programmers to comment upon GFA Basic 3, with consideration to other rival products (see boxed sections on the right).

Product : ..... GFA Basic 3

Supplier : ..... Glentop Press

Price : £65.00

Upgrade from V2 : ..£40.00
(Send manuals and disks)

Second opinion, Mark Annetts.

When Fast Basic first appeared it was described, at the time, as a C killer. Sadly, this turned out to be slightly optimistic. It may well be the case that a Basic will never be a match for C.

HiSoft Basic must already be a contender for such a claim. For my money though, GFA Basic 3.0 comes even a shade closer.

GFA Basic version 2.0 was a very powerful language that allowed easy access to many of the ST's hidden depths. With version 3.0 I can't think of a single part of the ST that is not now under perfect control of the language. Examples of direct bit/byte manipulation, line-A routine calls, full control of all the ports, Joystick included, and direct VDI and AES calls, spring readily to mind.

Improvements to the editor are noticeable. Always a subjective matter, but I've found it perfect for the job of writing programs. I especially like the new-found freedom of the mouse pointer when the language is being used in low resolution.

If the promised compiler delivers the twin requirements of speed of compilation and speed of object code then I, for one, will be happy to acknowledge GFA Basic 3.0 as the best all-round Basic available on the ST.

Third opinion, Barrie Capel.

GFA V3's approach to programming in Basic is refreshingly different. With its full screen, fast scrolling editor that 'flips' to another screen for typing in direct commands such as PRINT A$, (try doing that in other ST Basics when a program has ended), and for experimenting with the superb range of graphics commands.

With almost 400 commands, full structuring (a la Pascal), and line syntax checking before you run, it really is a doddle to use. For those of you who have upgraded from the Atari 8-bit, you will be pleased to know that it is similar to Atari 8-bit Basic, but unbelievably fast (an empty integer For...Next loop counting from 1 to 100,000 took just 2.62 seconds!)

The manual really impressed me, over 500 pages, with almost every command having its' own listing. GEM is fully supported and there are Basic commands for VDI, RCS, and AES libraries, plus total control of A-LINE routines, EVENTS, MENUS and WINDOWS. Many simple commands, have their equivalents using these for the more experienced ST owner who wants to really experiment.

Windows are under total control, but there isn't a sign of them until you actually ask for them. Just how it should be!

Conclusion? Throw away your other Basics, this is the one you need. I have done already!

GFA Basic 3

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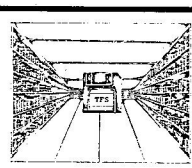

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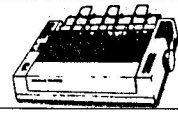

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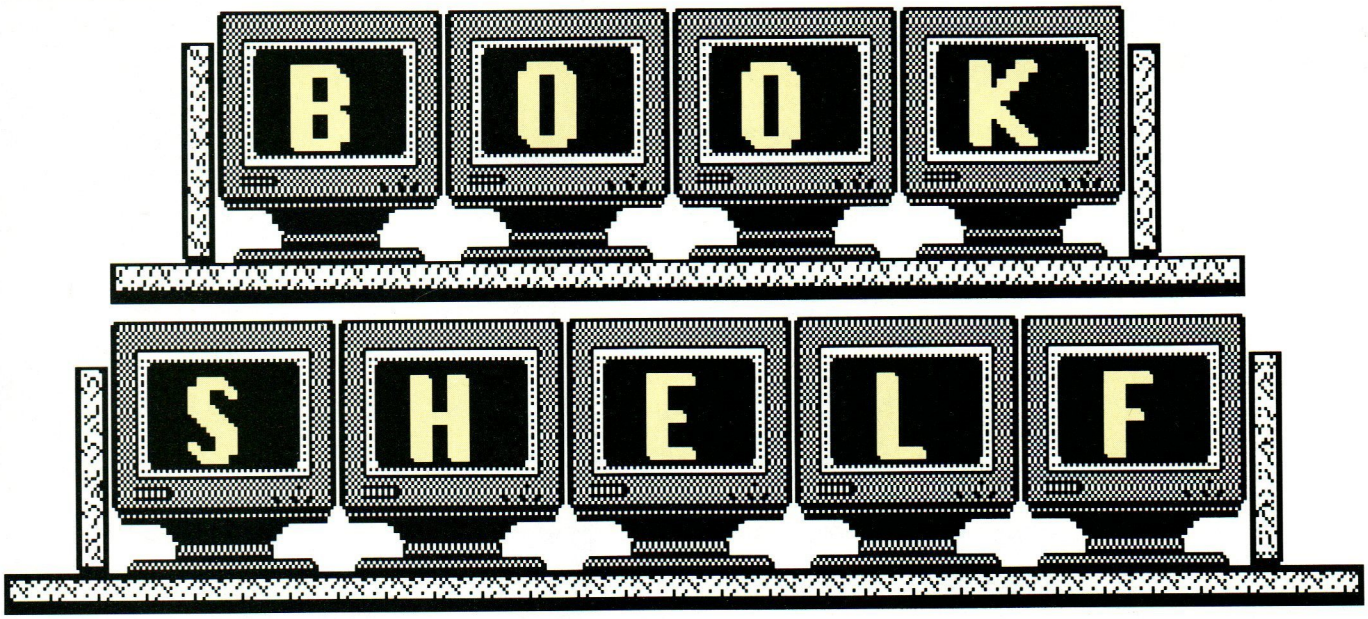


GFA Basic Advanced Programming

Frank Ostrowski
Glentop Press
228 pages
£15.95 (£19.50 with disk)
ISBN 1-85181-171-0

The pedigree of this book could not be better, for it comes from the author of GFA Basic itself, Mr Ostrowski. Aimed at teaching more advanced programming, all the programs in the book are available on a companion disk.

The first part of the book is a collection of useful hints and tips about getting the most from programming in GFA Basic. The information here follows no real order, and the wide and varied topics covered include: speeding up programs, manipulating disks and more advanced graphics.

The firmware facilities that are available to programmers on the ST form the subject for the second half of the book. Although the text outlines the functionality of The low level routines, such GEMDOS and the BIOS's, Mr Ostrowski does not always provide enough information to enable programmers to make full use of them. For example XBIOS(36) is described as a "subprogram of the Hardcopy routine and points to an address that contains all sorts of parameters", and the entry for GEMDOS(7) contains nothing but the name of the routine itself.

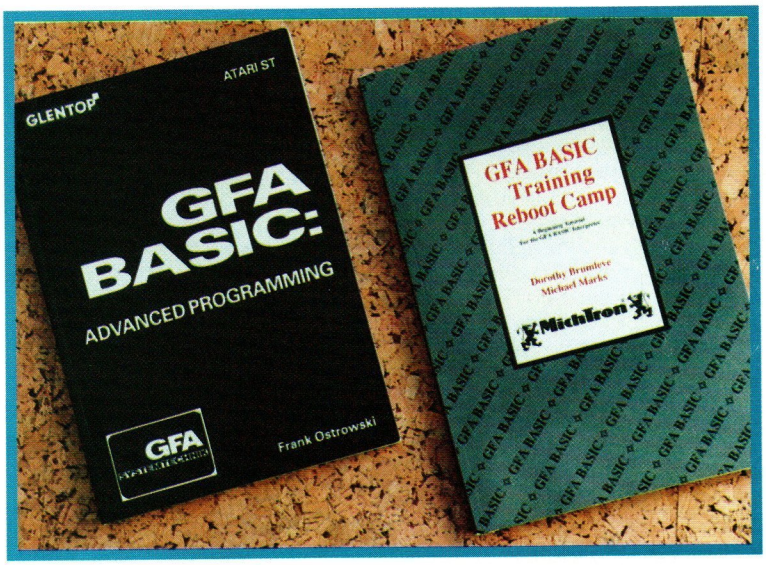
As most of the VDI routines exist as GFA Basic commands, the GEM section of the book concentrates on the AES library. Apart from the source code to a program which demonstrates what can be done with windows under GEM, most of the text is taken up with details of the routines that make up the AES.

The book does not quite justify the publishers assertion that it is "the essential companion for any GFA Basic programmer and should take its place on every serious ST user's bookshelf", but nevertheless, it does contain a useful assortment of information.

GFA Basic Training Reboot Camp

Dorothy Brumleve and Michael Marks
MichTron
260 pages
£19.95
ISBN 0-944500-02-1

Although you may not guess it from the title, this book is in fact an introductory guide to the GFA Basic interpreter, and may be bought along with an optional disk which contains all the programs in the book, plus a few other utilities.



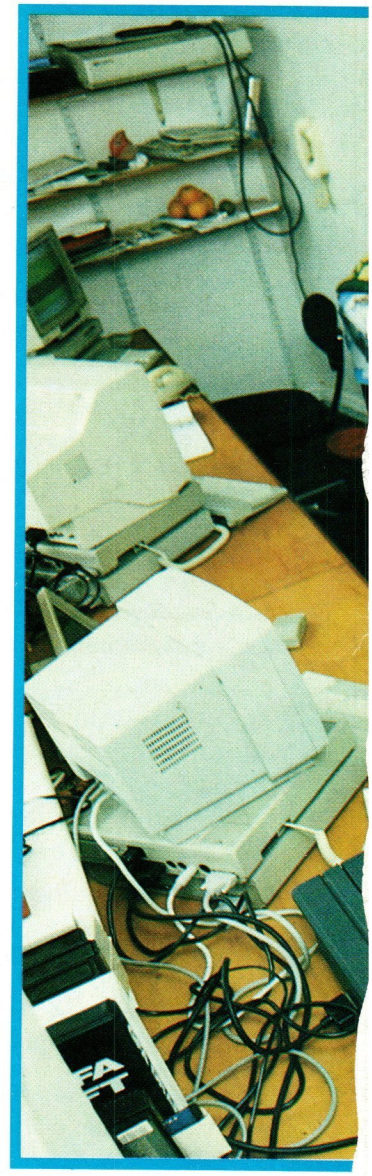
This text belongs firmly in the 'hand holding' category of tutorials. After a brief introduction to the GFA editor, the book moves on to cover the Basic language. The authors have divided the commands available under GFA into separate topics, and work through each of these one by one. The tutorial is written in a very clear and interactive style which encourages the reader to examine and alter small extracts of code to see how they actually work.

Ms Brumleve and Mr Marks have a style of writing that is perhaps a shade too patronising. The book contains too many comments of the "Oops! What happened?", "do you remember how to..." and "lets see what happens if..." variety.

Working through the 'self-test' sections at the end of each chapter will prove a useful means to determine how well particular topics have been understood. Unfortunately the authors have not included the answers to their questions, and so readers who encounter problems are simply advised to "look back through the chapter".

A major criticism of the book is the way in which it concentrates on the individual GFA Basic commands, rather than on how to actually program. In this respect the book does fall short of the publisher's promise that it "provides a solid foundation in programming techniques and concepts for all beginning programmers". Nevertheless, the book has a useful role for those taking their first steps in programming with GFA Basic. END

THE CITY AND HACKNEY ASSOCIATION FOR MENTAL HEALTH



Martin Walsh visits the CHAMH to discuss the work they put ST systems to in their Computer Project for those having experienced psychiatry.

The City and Hackney Association for Mental Health has charitable status and was established in 1981. Referred to locally as CHAMH, it is located in the centre of Hackney, only a minute away from the British Rail station, ideally positioned for local residents. Affiliated to MIND (the National Association for Mental Health), membership of CHAMH is free and open to anyone living or working in Hackney. I was fortunate enough to spend several hours with Andy Smith, the Information Technology Training/Development Worker for CHAMH, responsible for the Computer Project. To understand the purpose of the Computer Project, it is first necessary to be aware of the milieu in which it operates.

In general terms, CHAMH aims to encourage greater provision of mental health services in Hackney. The organisation has set up several projects, including the Computer Project sited at the Hackney centre. Andy explained: "The Computer Project seeks to provide training for employment as a side effect of learning new skills. The skills obtained through the project at the centre have other relevancies than simply enhancing employment prospects." For some of Andy's client group, the control of the discrete environment characteristic of a computer system can enable them to develop life skills that have direct applications in the wider social world where many things are beyond their control. Indeed, as Andy carefully explained: "Our clients are in a position of systematic devaluation. The labels and roles thrust upon them usually augment existing disadvantages. The Computer Project is characterised by a positive atmosphere which combats this downward spiral."

CHAMH is financed by the London Borough of Hackney and the North East Thames Regional Health Authority. "This borough has a high population density and systemic and widespread social deprivation, second only to Tower Hamlets in the league table of urban poverty," Andy informed me. The resources of the Computer Project are targeted at a specific client group, namely anybody from the local borough who has been subjected to psychiatry. The age range stretches from about 16 to 60, with no discrimination across class, sex, or creed. "Our client group start from a position of low self esteem and I don't wish to add to it by setting a client profile that would exclude anybody who might genuinely want to do the course." Significantly, potential course members have to show enough interest to refer themselves.

A client relaxing with a Video game (Black Lamp).

"Since clients and potential clients range from those who are very withdrawn with little or no confidence to people who are very voluble and dominate conversations... the task of selection is very difficult. When one adds to this the fact that the group size is likely to vary considerably, one can appreciate the very complex and personal nature of selection. For example, one has to be sensitive and not place two withdrawn clients with a group of voluble clients!" Hardly a task for computerised selection procedures!

The course on offer through the Computer Project is running on a rolling basis regarding enrolment, with students taking as long as they need. It is envisaged that some students may rapidly reach the examination stage, for example within three months, with some students gaining employment prior to completing the course. Others may take

IAN TINDALE

up to 18 months.

The history of CHAMH's Computer Project...

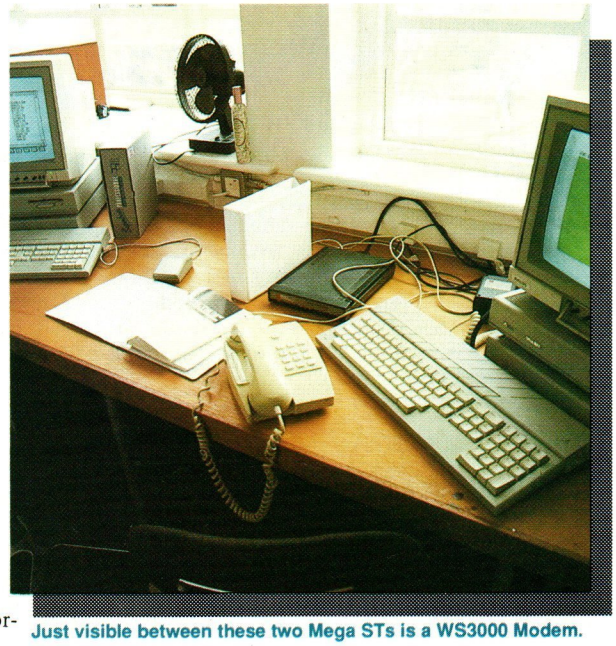
The history of the Computer Project is arguably one of initial confusion; grand aspirations and a slowly dawning realisation that the potential benefits of Information Technology (IT) had to be sought and earned, rather than simply 'purchased'.

Back in the days of olde, when Kenneth Baker was the Information Technology Minister, there is a strong case for suggesting that a lot of people jumped on the band wagon and thought that it was a soft option to become involved with IT. Since, traditionally, occupation therapy and industrial therapy has been on the level of having clients do such pleasurable tasks as packing, letter press printing and catering (to name but a few), IT was an attractive if somewhat under-resourced alternative.

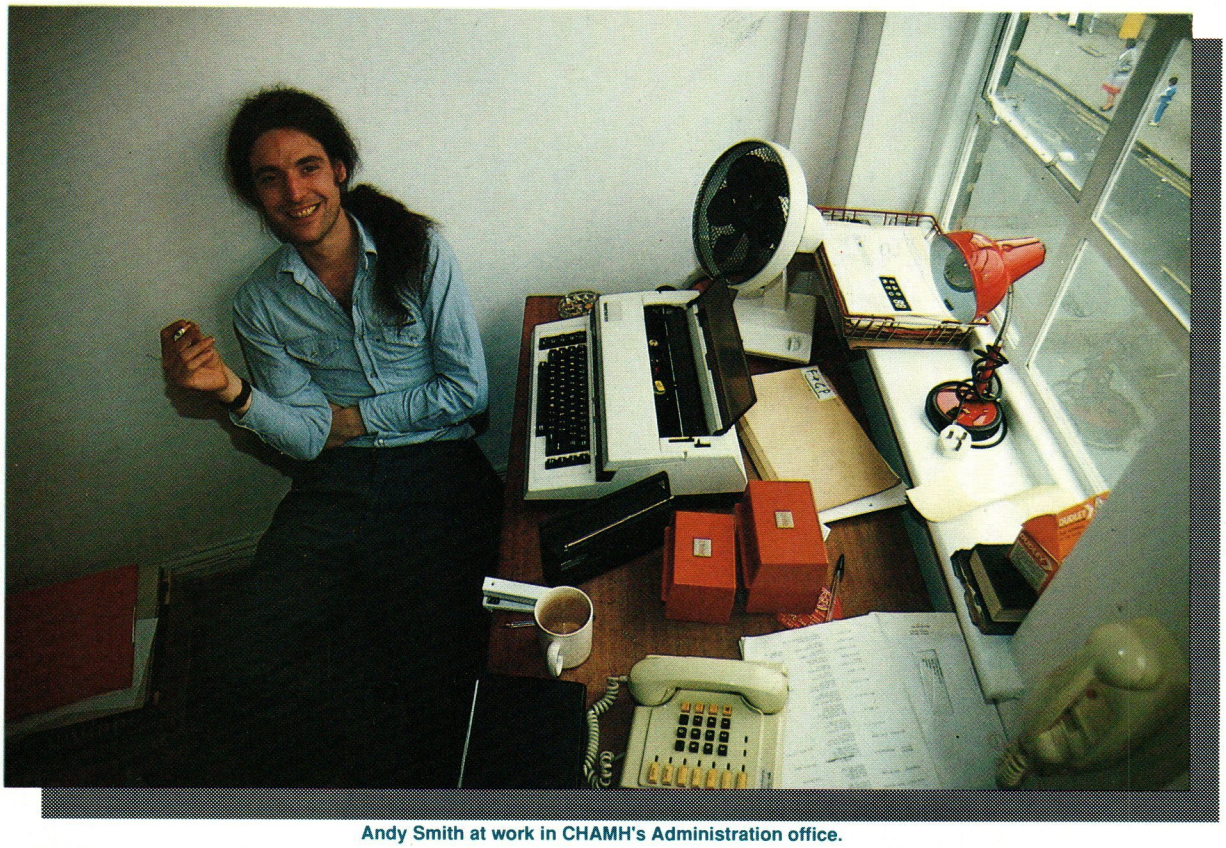
Some would suggest that the Government soon forgot about its commitment to IT, and this left many groups in dire difficulties. Fortunately, the development worker for CHAMH's Computer Project prevailed through continuous denials and rejections regarding funding applications until she was eventually successful. This was in the financial year 1985/1986. In financial year 1987/1988 Andy Smith was appointed. Prior to Andy's arrival, an abortive project had been launched using IBM XT systems! After an initial evaluation period during which decisions were made about the location and format for the centre, Andy researched the hardware and concluded that the Atari ST range was the most appropriate for the needs of the proposed client group and within the budget which had been allocated.

Cost was a very significant factor, as Andy pointed out. "I estimated that to set up a comparable range of hardware/software combinations following the MS DOS path would have been at least double the cost and well outside our price range." Further, when we discussed the merits of the Atari ST range and the user-hostile MS DOS command line environment, Andy explained: "I didn't want to subject computer novices to an environment that could, for example, format a hard disk by mistake simply because of mistyping! The Graphics Environment Manager (GEM) found on the Atari STs is particularly attractive to computer novices."

The main thrust of the work done at the Computer Project is to equip people to more effectively compete in the employment market place. "To ensure the highest possibility of people becoming employed it is necessary to negate some of their employment disadvantages. My personal experience showed that employers were much less critical in their selection processes when there was a shortage of a



Just visible between these two Mega STs is a WS3000 Modem.



Andy Smith at work in CHAMH's Administration office.

particular skill. To teach these skills it is necessary to use leading edge technology, hence the investment in Atari hardware."

However, as Andy accurately pointed out, "The present hardware/software set-up won't continue to offer this advantage indefinitely and I will need massive recapitalisation within 18 months." Already Atari are developing systems embracing new technological developments, such as the Abaq... and what is declared publicly might only be 'the tip of the iceberg'.

The Syllabus of CHAMH's Computer Project

The core is to be the RSA (Royal Society of Arts) CLAITS (Computer Literacy and Information Technology Scheme) examinations. The syllabus content embraces applications of computers and information technology. Each part of the syllabus lists the individual skill elements to be achieved as "Assessment Objectives" and associates with each group of these a "Profile Sentence". The latter outlines the skills which have been achieved, which can only be demonstrated through the practical use of a given application package; for example, a word processing package or a videotex system.

Why did Andy select CLAITS? His answer came quickly: "An article in ST World, back in 1987, first roused my interest in CLAITS." Andy contacted local employers who were very positive in their approval of the proposals based around CLAITS. Andy then began negotiations with RSA which were finalised in January of this year at the education show at the Barbican, London. "The practical nature of the examinations make them attractive to both clients and prospective employers."

However, before clients approach the RSA examinations Andy hopes that they will find a lead into business computing via an existing interest. For example, this might be through interests in music, art, drawing, creative writing, to name but a few. As a by-product of this interest carried over to a computing environment, it is hoped that they will learn by default. "I don't mind how people master the basics of computing, and with GEM learning a new package is reduced to package-specific features."

Supply & Installation

When one has tens of thousands of pounds to dispose of, albeit carefully budgeted and controlled, the need for accurate and truthful information is great. I asked Andy where he purchased much of the hardware and software from. Andy replied: "Having eliminated the box shifters and time-wasters, I was fortunate enough to contact Trowbridge Computer Shack who displayed expertise in the Atari range, and in most of the applications that I intended to use the hardware for. For example, the customisation of the portable computer was a low-cost solution devised by the team at Trowbridge as an alternative to my more expensive proposal."

Hardware resources

The range of hardware available to students of the Computer Project is impressive. The core elements are, of course, the 4 megabyte Mega ST systems (6). These are well supported by a variety of peripheral devices, from a Hawk Scanner to a Miracle Modem. The full list at the time of writing was:

6 Mega 4 STs complete with SH205 hard drives, 4 low/medium resolution monitors, 2 SM 124 monochrome monitors, 2 Citizen 120D printers (9 pin), 1 Star NB24/15 printer (24 pin), 1 Atari laser printer, 1 Hawk CP14 scanner , 1 Miracle WS3000 modem, 1 Miracle WS4000 modem, 1 CRP digitising tablet, 1 Casio HT3000 Midi Synthesiser, 1 Sanyo CCD video recorder, 1 Sanyo VCR (Video Cassette Recorder), 1 SAM digitiser, 1 Philips tuner module AV7300 1 Toshiba T1100 plus

The Toshiba portable is for Andy's own personal use. Since Andy is dyslexic, Trowbridge modified the keyboard by placing mirror images (about the vertical axis) in all legends on the keycaps. The following keys apply: B C D E F G J K L N P Q R S Z, because these characters are asymmetrical around the vertical axis. Andy uses the Toshiba for taking notes at the numerous administration and policy meetings, and also for much of his typing at the centre since his typing speed is much faster on the adapted Toshiba than on one of the standard Atari Mega keyboards. For hardcopy he simply plugs it into one of the matrix printers.

Software resources

An equally impressive range of software is available. In addition to the expected spread of traditional data processing and text programs, there are several particularly interesting titles.

1st WordPlus, K Roget, VIP Professional, SuperBase Professional, FastCom, Michtron BBS Version 2, Laser C, GFA Basic & Compiler, GFA Draft, GFA Vector, Timeworks DTP, Degas Elite, Spectrum 512, CAD 3D 2.00, CyberMate, HJB Paint (Hawk Scanner Specific), Grafix,

Trip-a-Tron, Defender of the Crown, Marble Madness, Bubble Ghost, Black Lamp, Little Computer People, Deja Vu, Tass Times in Tone Town

I questioned Andy about some of the games available to students. His reply was most illuminating. "Little Computer People, for example, was purchased because one of the accusations levelled at people in distress is that they either don't know how or don't bother to care for themselves. The object of this program is to care for the physical and emotional needs of another being. As an illustration, if you don't give Rocky enough 'pats' he becomes very depressed and his mouth turns down; if you don't feed him enough he turns green. If people can learn by example then this program can contribute to their capacity to care for themselves."

Our discussion touched upon frantic and destructive arcade games, of which Andy had little regard. "I selected the adventure games to show that mindless violence has very little going for it as a philosophy for life." A sentiment no doubt echoed by many readers.

The future

One of the most interesting aspects of any visit for an ST World at Large feature is the inevitable discussion regarding the future vis-a-vis the Atari ST range and a specific project. Andy proved to be no exception to this 'rule'.

"As finance dries up, the nature of the Computer Project must evolve to the point where it becomes self sustaining. I am already laying plans to enable this to happen. It is hoped that we will be able to offer a 'value added service' to local businesses and community groups. This will not take the form of cheap services based on cheap labour, rather more will be offered for the same commercial price." An example Andy discussed was typesetting, where the client would be able to watch the page being set and contribute to the process.

Another urgent consideration is distance learning. Many young mothers in areas such as Hackney experience severe distress in coping with the heavy demands of children in a very hostile environment. Sadly, some mothers give way under the strain and end up in psychiatric 'care'. "An immediate need is for a way to enable such mothers with young children to participate fully in the course yet still be able to meet their children's needs." Andy has several possible solutions under consideration, ranging from the more traditional creche provision, which would require ongoing funding, to a more novel solution to difficulties in school holiday times. This would make use of the more portable Atari STFM range which mothers could then use at home as and when necessary. Such a solution would not require ongoing funding, rather one-off capital expenditure. Our thoughts inevitably embraced the much rumoured Atari portable, the STACEY? If this is to reflect Atari's philosophy of "Power without the price" then it might be an ideal solution to this particular problem. (Atari, are you reading this?)

Another idea under development is a Bulletin Board specifically targeted at groups of people who have in common a history of psychiatric treatment. "Most of the information about the effects of drugs and treatment are written by and for psychiatric professionals in language that is at best obscure. There is a great need for an information resource written by and for those having experienced, or experiencing, distress as a consequence of psychiatric treatment... in language which is plain and accessible. Sig groups would range from the effects of drugs to the legal implications of incarceration." The major drawback to an early implementation of this concept is the vital need for multiple access to the Bulletin Board, and vast amounts of data storage facilities. Andy has calculated that initial needs are best measured in gigabytes rather than megabytes! "For example, actual patient and client accounts of their experiences would need to be verbatim, and since a very large number of such records would be necessary, conventional and readily available storage devices will be inadequate." Andy does not see the way forward for the Bulletin Board with the Atari ST range, in the main due to the serious lack of a multiple RS232 port. He is currently considering powerful mini computers as the only practical way forward.

I thoroughly enjoyed my visit to CHAMH and my conversations with Andy Smith. It is good to see the Atari ST range being utilised for the benefit of a historically powerless minority group in society. Many argue that information is power; it follows that knowledge concerning the means of accessing information is a valuable and desirable commodity. That CHAMH seeks to propagate such knowledge is admirable. END

City & Hackney Association for Mental Health can be contacted at:

345a Mare Street,
Hackney,London
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Tel: 01 985 7965

Alison Bugg, Administrator.

GFA Artist

If you have at least one Megabyte under the bonnet, and a yearning to get colourfully animated, then GFA ARTIST may be just what you are looking for - Andy Mitchell investigates.

This colourful addition to the growing catalogue of GFA programs brings together, in one utility: a sophisticated drawing package; the means to simultaneously display 512 colours on a low resolution screen; and an easy-to-use animator. The software is written in GFA Basic - and is in itself an overwhelming argument for the language, as the result is extremely good.

There are many existing art packages for the ST but I believe that GFA ARTIST is the first to combine all of the functions necessary to create an animated film into one complete program.

Degas and Neochrome were amongst the first drawing packages to give us the ability to produce sophisticated art work on the ST and in many respects the standard they set has yet to be bettered. The next hurdle to be overcome by the software writers was the 16 colour pallete restriction in the low resolution mode. The new generation of software in the shape of Quantum Paint and Spectrum 512 played clever tricks with the hardware and gave us the ability to fill the screen with rainbows of various hues. Paralleling these developments, the field of animation was being well served by the Aegis Animator and Film Director software. Aegis gave us the means to whirl and tumble the simple shapes which it could produce, but it needs the services of a seperate drawing package to produce more detailed objects. Mirrorsoft's Film Director can produce beautifully animated cartoons, but again it does not incorporate a suitably sophisticated drawing package to create the initial sprites. The GFA Artist software has been created to incorporate all of these developments into one utility and I think it's fair to say it has succeeded admirably.

"There are many existing art packages for the ST but I believe that GFA ARTIST is the first to combine all of the functions necessary to create an animated film into one complete program."

The Drawing Tools

GFA has its control panel superimposed on the drawing screen in the same manner as Neochrome. Looking first at the drawing tools, we find a panel of icons which contain the familiar brush, spray-can, and area-fill selections. Standard shapes, such as, rectangles, circles, ellipses etc. are also available. Unfortunately, these shape options share a common limitation with other packages that I find so annoying. Once the start point for the regular shape has been selected and the shape expanded to the correct size, it cannot then be 'floated' into a final position, but is fixed at the initial point of creation. This is a feature which future packages should address. As yet, the only package which I have seen which has this feature is Finesse Paint from Advanced Memory Systems, and that package is yet another piece of mystery software which is always being announced as 'available soon'. Whilst the drawing tools in GFA Artist are on a par with other packages, there are a few features which I feel could have been better implemented.

Firstly, there is no on-screen colour pallete, either on the drawing screen or the control panel. This is irritating as it can require up to three selections to ascertain the current colour. Secondly, there is no 'Continuous-Line' drawing option which I find so useful for 'roughing-in' the initial scenes. Lastly, and most importantly, after each use of an icon the cursor returns to the control panel thus losing your current position on the drawing screen. This feature makes accurate alignment of successive selections most awkward.

Screen Benders

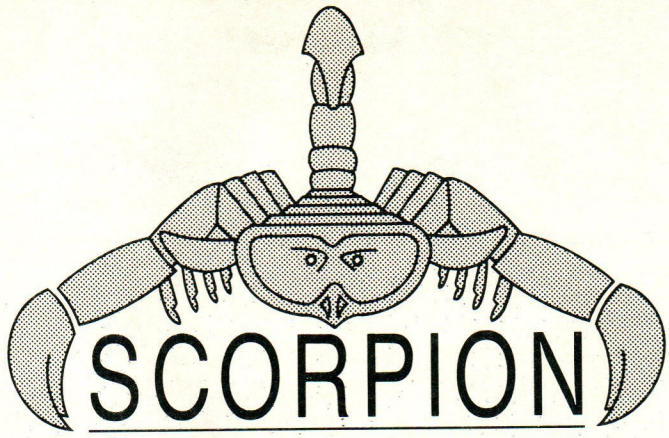
Complementing the usual drawing tools, the panel contains some very clever additions. Having drawn an initial shape you may now distort the picture in a wide variety of ways. You may elect to squeeze, ripple, invert or tie the flat screen into knots with the many wonderful screen-bender icons. In a matter of moments you can turn Venus into a doughnut or wrap her fair face around a grecian urn. Many of these options incorporate the additional novelty that they can carry out the distortions in a selected number of animated steps, thus producing a short film. As we shall see, there is a further bonus to be gathered from this option in that these intermediate stages of the distortion are saved as individual sprites in a library.

Format

The data format produced by GFA ARTIST is compatible with NEOCHROME and DEGAS making it easy to 'import' screens from these other sources. Each screen comprises approx 33K.

The standard additions of 'colour-fill' and 'text font' editors are provided and these operate in much the same way as other systems. There are, however,

more.....



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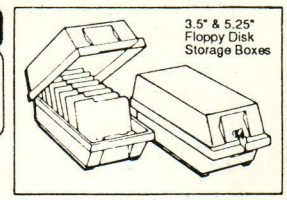

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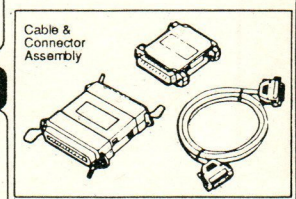

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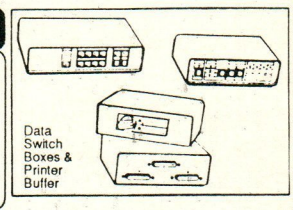

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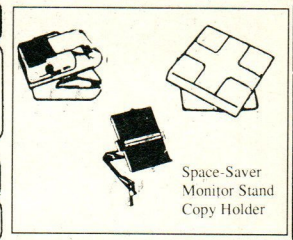

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only two text fonts supplied which is a little restrictive.

Enhanced colour mode

The option to dramatically increase the number of screen colours displayed in the low resolution mode seems at first glance a huge plus for some of the newer art packages, but as usual things are not quite as they first appear. The method which must be employed forces us to use these extra colours in carefully defined areas of the screen. Within these rectangular areas you may elect to substitute a current pallete colour for a band of colours (max 8) which gradually merge between the first and last of the selected band. This generally means that you have the capability of producing beautifully merged bands of one hue which look great for sunsets and special effects. Whilst this option is fascinating, I suspect its use is limited and I would not let its inclusion in any package carry too much weight when making your choice.

The facility to 'cycle' colours is available both in the standard 16-colour and the enhanced colour modes. This option is not available, however, during the use of the animator facilities.

The Animator features

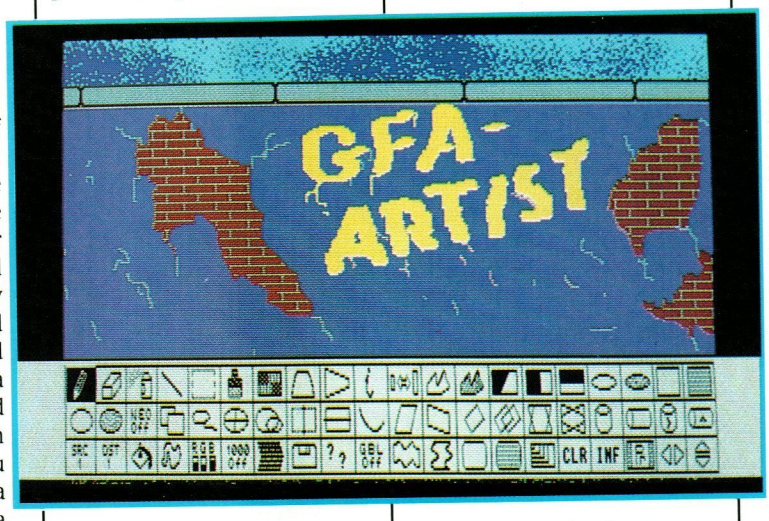
The most impressive aspect of this software is the Animator. By using the drawing package in a variety of ways, you may create a library of individual shapes (sprites). In a similar manner to the production of a film-based cartoon, you will be required to place these sprites within individually numbered frames which can then be 'run through' in the same way that you flick the pages of a book of drawings to create movement. Comparing further the analogy of a book of individual paper sheets with this method, the computerised system has many advantages. To create the smooth movement of a sprite across a paper screen would require the artist to draw the sprite at many intermediate positions. With the computerized method you need simply indicate the starting and finishing positions, plus the number of intermediate positions you wish to have, and the computer will calculate and create the intervening frames. The more intermediate positions you have the smoother the movement. Should you also wish the sprite to change its shape during its travels (e.g. enlarge) you could use one of the distortion tools in the drawing package to assist. As the distortion options permits you to state the number of intermediate stages during the transformation stage, you need only use that same number previously selected as the number of movement stages to make the final effect of movement and shape change merge smoothly.

In addition to the concept of individual sprite movements you may create a 'group' from a number of sprites held in the library which then will be treated as one item. This option makes the creation and movement of complex shapes quite easy and speeds up the final production of your film.

As mentioned previously, your system is required to have a minimum of one Megabyte of RAM to use this aspect of the package and this will enable you to produce an animated film of 2000 frames in memory. There is an additional option to merge films and produce a film of 20,000 frames as a 'run-only' option.

Producing large films is a time-consuming process but, happily, the animator control panel contains a large number of options which enables many short cuts and permits you to copy and edit large numbers of your previously created frames to assist in the production of the new sections. For example, once having created the frames showing the 'ascent' of a ball, you may, with one command, copy these in reverse order to provide the new 'descent' frames.

The documentation associated with the animator is, as you would expect, initially confusing. Happily, a demo film has been included with the package and, as usual, the old adage: ' a picture is worth a thousand words', is certainly true in this case. The documentation is not helped by a typographical error in the 'Getting Started' pages which ensures that your first experiment won't work! However, as these tribulations are par for the course with all documentation, it takes only a few hours before the light of realisation breaks through and the basic concept is soon grasped.



Conclusion

The basic drawing capabilities of the software are on a par with those of other dedicated drawing packages. However, they are much better than those normally found within dedicated animator packages. The animating capabilities are probably superior to others presently available and are easy to use. The combination of both of these facilities into a single integrated system makes GFA Artist a fascinating piece of software which will provide hours of creative fun and artistic development. END

Product: ...GFA Artist

Authors: .....Michtron

Distributor:Microdeal

UK Price: £49.95

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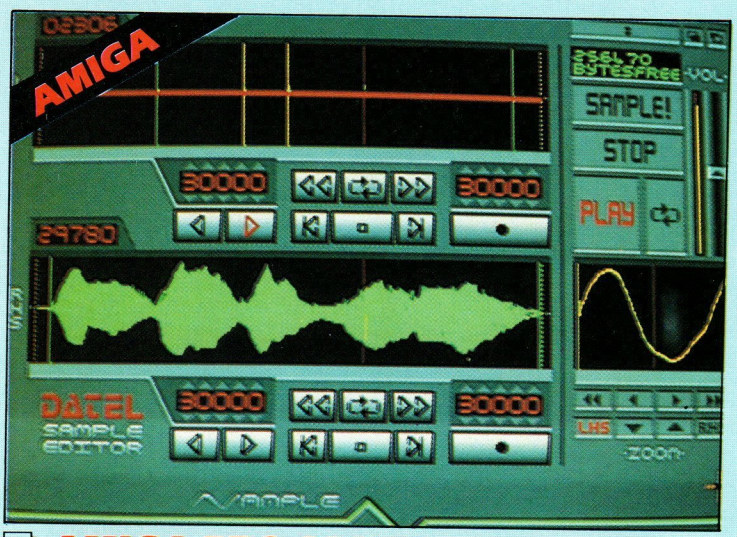

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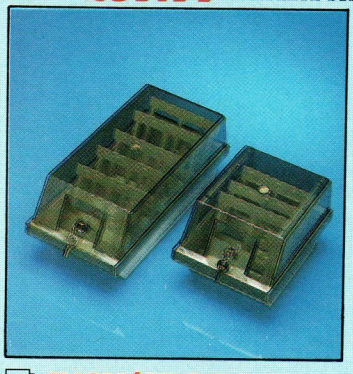

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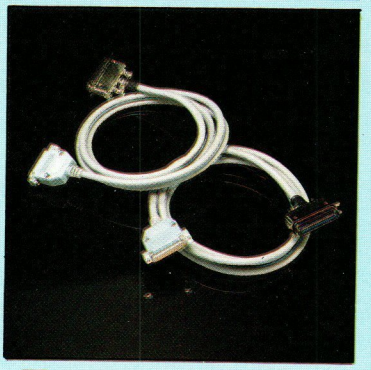

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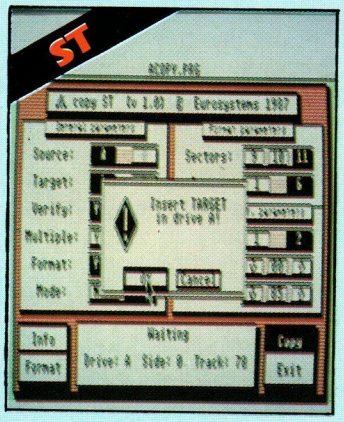

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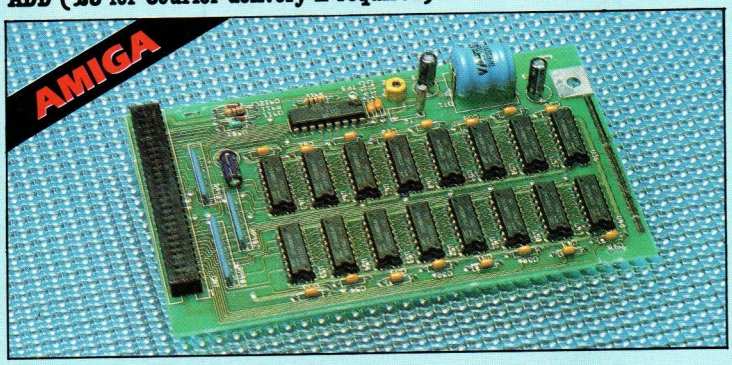

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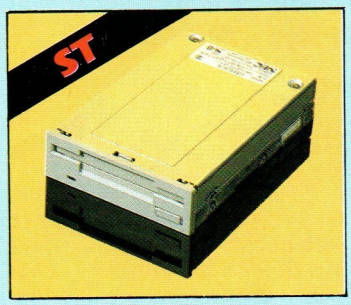

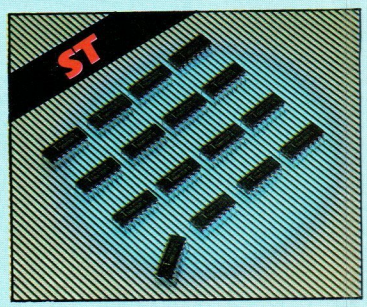

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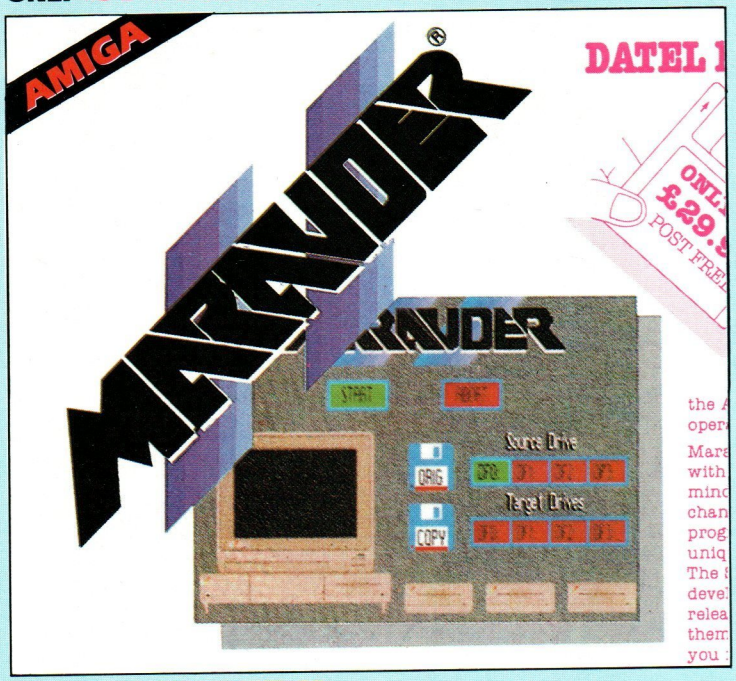

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STOS PREVIEW

Just when you thought it was safe to choose a Basic, along comes yet another version. Mark Annetts provides a preview of what promises to be something special.

Is it a language or is it a games development system? In the tradition of a Great-British compromise, STOS Basic turns out, neatly, to be both. Which is ironic really, as it is French by birth.

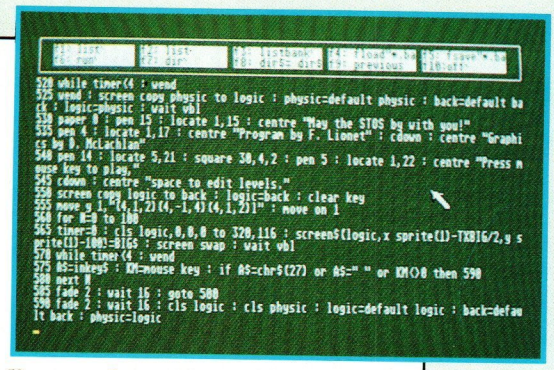
Marketed internationally by Mandarin Software of Macclesfield, but written by Jawx International of Paris, STOS sets itself the rather ambitious task of being able to produce true professional quality games from just a few lines of Basic. Possibly against all expectations, it appears as if STOS Basic does just that.

The program comes on three unprotected single-sided disks with an accompanying manual. It consists of succinct descriptions of all the conventional aspects of Basic and detailed, tutorial-like descriptions of all of the special STOS commands. Which is just as well, because STOS, for the most part, behaves most unconventionally.

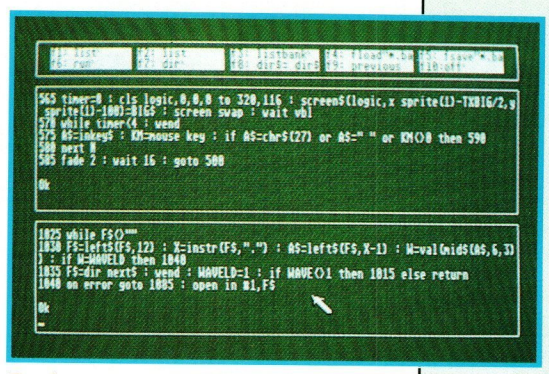
The main Basic program comes on one disk with a second disk containing three demonstration games and the third disk a selection of accessories and data files.

These accessory files are not to be confused with conventional GEM accessories as they are written in STOS Basic. They are really just executable Basic programs that can be loaded into memory at the same time as the main program being worked on in the editor. Twelve of these can be held in memory at once, provided there is enough RAM to go round. Likewise, the editor itself can hold four separate programs at once, memory permitting. As it all this were not enough, each program can have sections of memory allocated to it called banks. These banks contain sprite, music or, indeed, any user-definable data, specifically for that program.

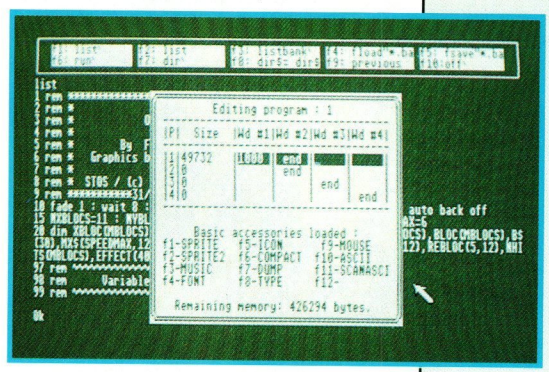
The editor is a full-screen affair with the cursor able to be manoeuvred by both the cursor keys and the mouse. STOS Basic programs themselves must have line numbers, as this is the only way for the editor to differentiate between direct and programmed mode. Don't expect a modern structured language, such as, GFA Basic or HiSoft Basic. Anybody familiar with eight-bit Microsoft Basic, or any of its many offspring, will be right at home with



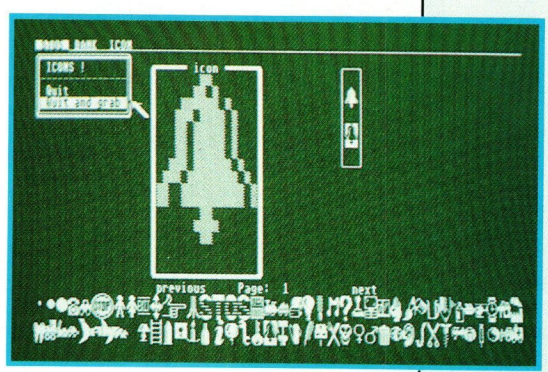
The editor functions in both 40 or 80 column in both low and medium. Being both mouse and cursor-key controllable it is very easy to get around. Note that line numbers are mandatory. Also note that this is a surprisingly conventional (AKA old-fashioned) Basic in terms of structure. Eight-bit Basic programmers will feel comfortable with STOS from the start (except BBC Micro owners, of course).



Here is the screen editor splitting itself into two. This manipulation of the various Basic programs in memory allows for a very flexible approach to routine management.



The HELP key brings up the memory management and accessory call-up box. With some of the larger accessories loaded you may soon find yourself running out of memory on a half-meg machine. The package comes with a wealth of ready-written accessories all of which may be listed and altered if desired.



An example of STOS's own drop-down menus. Note the ability to define even the menu outline. This is one of the less glamorous accessories, a workman-like icon editor. Others cater for font editing, keyboard scanning, DEGAS picture compressing, mouse position reading, and others too numerous to mention.

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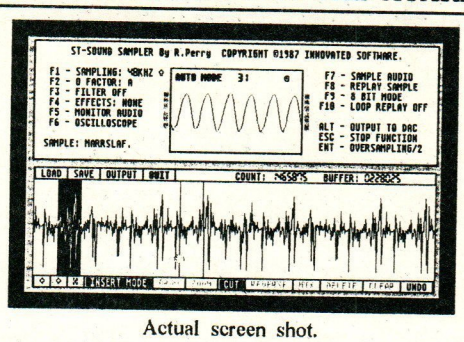

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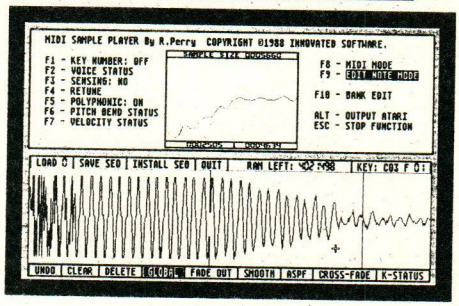

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STOS PREVIEW

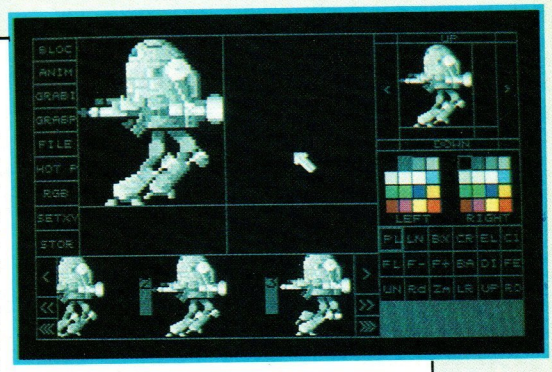
STOS. To quote the manual "GOTO is probably the most used of all the Basic instructions..." (and the most abused - Ed).

STOS completely ignores GEM, it is simple to jump back and forth between medium and low resolution, when using a colour system. STOS, incidentally, works quite happily in monochrome, although accessories, or programs, that have been specially written for one particular mode won't run in another.

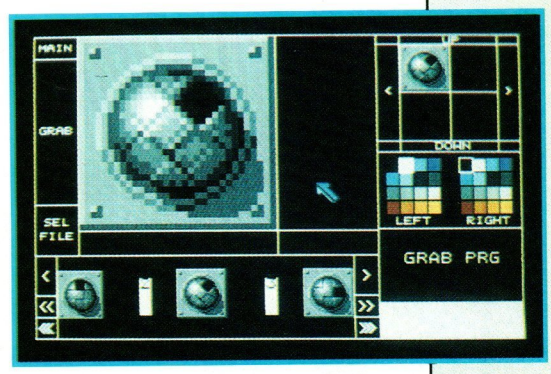
Due to the lack of GEM windows, the editor has a number of commands available to transfer any section of code between different programs. These make movements of favoured sub-routines particularly easy to achieve. It is also a simple matter to display more than one part of the same program at the same time by splitting the screen into two, three or four sections.

For inclusion into your own programs STOS provides its own version of windows and drop down menus, which in many respects are more powerful than GEM's own. Control of the mouse and joystick are both fully served and very low level access to the sound chip is provided, if required. STOS's main feature is, though, is undoubtedly its ability with the graphics. Multiple sprites, fine pixel scrolling of all or part of the background and full collision detection make games programming considerably more simple to achieve than any other language I know of.

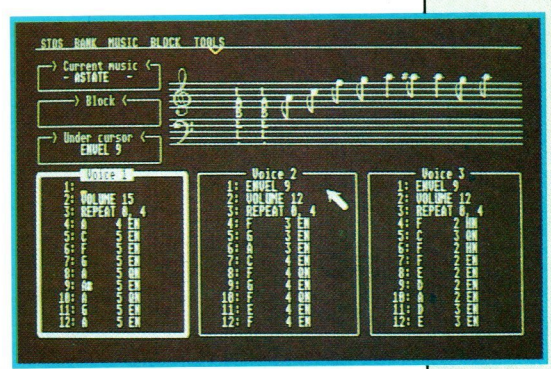
In the pictorial section of this preview I will try to point out the more unusual aspects of STOS Basic, rather than attempt to show the complete workings. If I don't cover one particular aspect or another, don't assume that STOS doesn't have it, as it probably has. I have barely touched the surface. Remember, a more complete round-up of this fascinating language will, hopefully, be in next month's issue. END



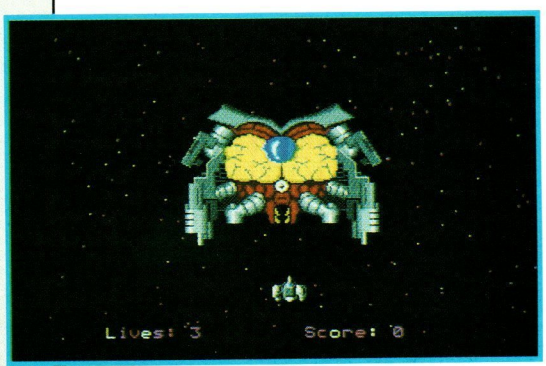
This accessory alone might be worth the asking price. Mandarin have promised that it will be improved still further for the official launch. It should be noted that STOS will move sixteen large sprites in any direction simultaneously, at the same time as flipping each one through sixteen frames of animation.



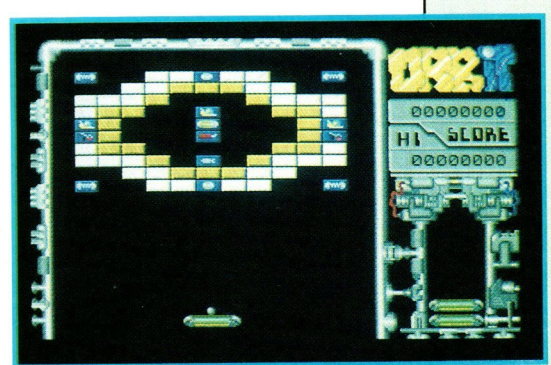
One hugely fun aspect to the sprite editor is its slightly controversial ability to grab sprite data from other people's programs. Doubtless, some companies won't find this quite so much fun. For example, here we have a prettily drawn gun turret, fresh from its success in Xenon.



The other major accessory file given away with STOS is the Music Editor. To be honest, this is essential to produce the interrupt-driven music, sound tracks that STOS is capable of delivering. Whilst it makes producing music possible, a reasonable understanding of music theory is still required, I'm afraid. It's nicely explained in the manual though.

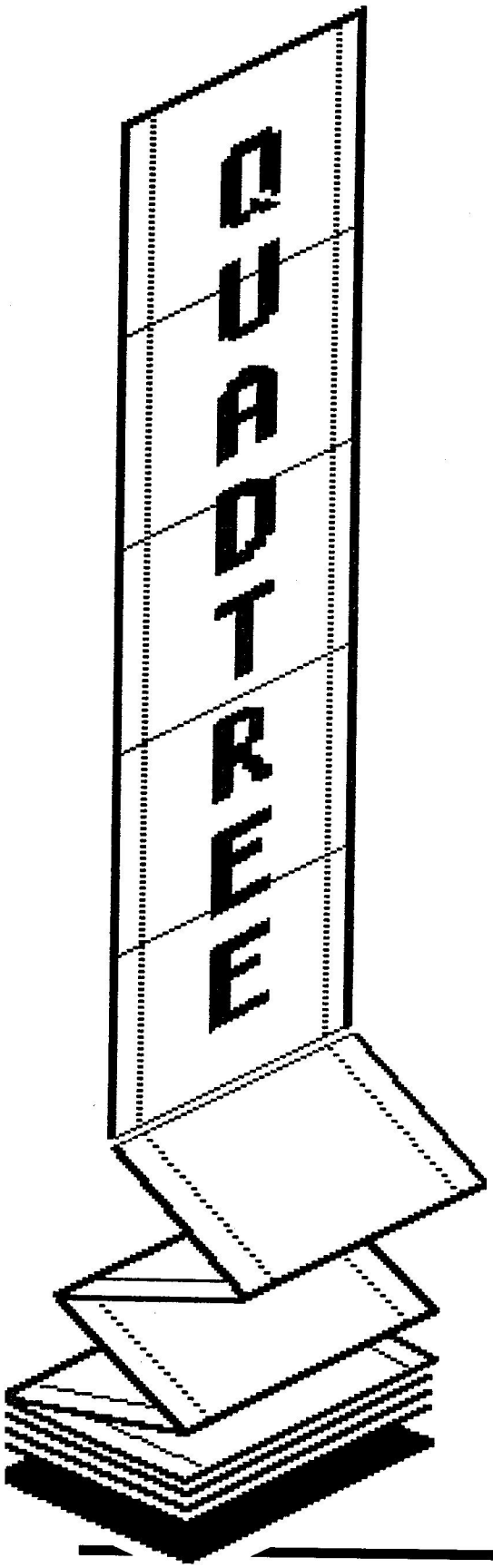


This shoot'em-up lacks the polish of the Orbit game, but nevertheless, hints at the possibilities available to the STOS programmer. An attack wave formation editor is thrown in for good measure.



Another of the freebies is this little gem. No better or worse than most of the other Breakout/Arkanoid clones doing the rounds at the moment. The code is listable and editable. I'm told by Mandarin that this took just two days to write!!

TYPE & IN LISTING



Gary McDonald illustrates the Quad-Tree approach to 3D graphics with an interesting program written in Fast Basic.

One of the ST's strengths is its multi-colour graphics capability allowing the generation and display of realistic 3-dimensional scenes. ST World has already published some 3-D line drawing programs and this article goes some steps further by demonstrating hidden surface modelling with lighting and shadow effects.

Traditional approaches to 3-D graphics have been based on the representation of solid objects by polygonal faces. This is adequate when the objects are indeed made that way, such as cubes, pyramids, etc., but the technique breaks down when curved surfaces, such as spheres, cylinders and toroids (hoops) are to be modelled. Unless many hundreds of polygons are used, the representation of such objects looks unrealistic.

A more recent technique which overcomes this problem is the quad-tree approach. Here, objects are represented in their true forms defined by mathematical equations and the image is created by calculating which lines of sight through the screen when projected onto the scene intersect the objects.

Imagine a scene comprising a number of spheres located in 3-dimensional space, their centres specified in what we will call the actual co-ordinates system. An observer views this scene from a specified direction and sees the spheres, as circles, on a screen - see Figure 1.

We assume here that the observer is situated at a very great distance so that there is no perspective, and the lines of projection of the spheres to the screen are parallel to each other.

We could then construct the screen image by considering each screen pixel in turn and imagining a square rod projecting from behind the screen into the scene. If this rod misses every sphere, we colour that pixel the background colour. If it hits one or more spheres we determine which one is nearest to the observer and then calculate the pixel colour, taking into account the basic colour of the sphere itself and the intensity of light falling on that point.

This method is perfectly feasible but can be very time-consuming. The quad-tree approach improves on it by first considering a larger area of the screen, not just an individual pixel. This larger area is a square section whose side has a number of pixels which is a power of 2, such as 2, 4, 8, 16, etc. If the rod for this square misses all spheres, we can set the entire region to the background colour (in practice, we set the whole screen to the background colour before we start so no plotting action is required for empty regions). If it doesn't, then the square can be divided into 4 quadrants and each of these tested. This process can be continued if necessary until the square is a single pixel, which can be processed as in the previous paragraph. This method will be faster if the screen contains empty regions, which will be filtered out before getting down to the 1-pixel level.

Figure 2 illustrates the process for a square initially 8 pixels wide. The resulting tree diagram gives the process its name.

Listing A

```
level=1
    while level>0
       while quadrantnumber(level)<=4
         while quadrant is not empty and level<=2
            level=level+1
            quadrantnumber(level)=1
         endwhile
         if level=3 then gosub PLOT:level=level-1
         quadrantnumber(level)=quadrantnumber(level)+1
       endwhile
       level=level-1
       quadrantnumber(level)=quadrantnumber(level)+1
    endwhile
```

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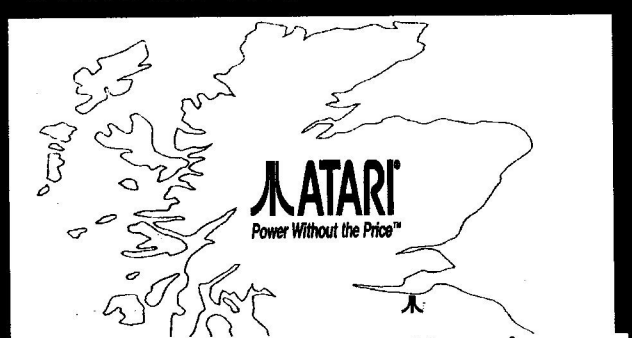

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The algorithm for generating and traversing this type of tree is as follows: imagine we are already at an intermediate level in the tree - not the first level, and not the lowest level. If the screen quadrant at that node does not contain any objects (A for example) we move to the next quadrant at that level (B in this instance). If there are no quadrants remaining at that node, we move up one level and move to the next node at that level (e.g. C to D to E). If, however, the screen quadrant is not empty, we move down one level and go to the leftmost of the 4 quadrants. If at any time we reach the lowest (pixel) level, we take no action if it is a background pixel but plot it in the appropriate colour if it is a sphere pixel. When we are back at Level 0 we are finished. Outline code for this can be seen in Listing A.

You will note that this algorithm does not test the original square as a whole, but immediately breaks it into its constituent quadrants. This would be unnecessary if the original square were empty and tested first, but starting the algorithm as we do, makes the coding more straightforward and it also runs faster in most cases.

From a practical point of view, the intersection test for a square cross-section rod and a sphere is more complex and time-consuming than a test for a cylindrical bounding rod and the sphere (see Figure 3). Admittedly this will occasionally mean more work as the square might be considered to contain a sphere when it is in fact empty and lower level quadrants will be generated unnecessarily (see Figure 4). However, this extra work is more than offset by the savings in performing the simpler test.

The test at the pixel level is made at the centre of the rod, not the bounding cylinder, so any irrelevant, spurious, intersections will be picked up and weeded out at this stage and there is no danger of actually plotting pixels which should not be plotted. Because this is a different test from the bounding cylinder test it is made part of the plot subroutine and we actually exit the tree traversal at the penultimate level rather than the lowest level.

The program at Listing 1 (which runs in low resolution) comprises a number of named blocks. These are now described.

initialise: This first sets maxs (maximum number of spheres) to 100 and then dimensions a number of matrices, including those used to store actual and

```
initialise:
maxs=100
DIM q(2,2)
DIM xa(maxs),ya(maxs),za(maxs)
DIM xo(maxs),yo(maxs),zo(maxs)
DIM rd(maxs),c(maxs)
DIM cx(5,4),cy(5,4),b(5,maxs),n(5),m(6)
DIM rod(5),o(5)
DIM sx(4),sy(4)
epsilon=1E-4
zoom=16:del=1/zoom
cx(0,1)=32:cy(0,1)=32
FOR i=1 TO 5:READ o(i):NEXT i
DATA 16,8,4,2,1
r2=SQR(2):FOR i=1 TO 5:rod(i)=r2*o(i)*del:NEXT i
FOR i=1 TO 4:READ sx(i):NEXT i
FOR i=1 TO 4:READ sy(i):NEXT i
DATA -1,1,-1,1
DATA -1,-1,1,1

shades:
FOR i=0 TO 15:READ r,g,b
PALETTE i,ROUND(r*1000/7),ROUND(g*1000/7),ROUND(b*1000/7)
NEXT i
DIM colr(2,8)
DATA 7,7,7
DATA 0,0,0
DATA 1,0,0,2,0,0,3,0,0,4,0,0,5,0,0,6,0,0,7,0,0
DATA 0,0,1,0,0,2,0,0,3,0,0,4,0,0,5,0,0,6,0,0,7
FOR i=1 TO 2:colr(i,0)=1:FOR j=1 TO 7
colr(i,j)=7*(i-1)+j+1:NEXT j:colr(i,8)=0:NEXT i

observer:
a=30:e=30
sa=SIN(RAD(a)):ca=COS(RAD(a)):se=SIN(RAD(e)):ce=COS(RAD(e))
FOR i=0 TO 2:FOR j=0 TO 2:READ q(i,j):NEXT j:NEXT i
DATA -sa,ca,0
DATA -ca*se,-sa*se,ce
DATA -ca*ce,-sa*ce,-se

light:
la=-45:le=60
xa(0)=COS(RAD(le))*COS(RAD(la))
ya(0)=COS(RAD(le))*SIN(RAD(la))
za(0)=SIN(RAD(le))
amb=0.2

spheres:
READ nball
FOR i=1 TO nball
READ xa(i),ya(i),za(i),rd(i),c(i)
NEXT i

DATA 4
DATA 1,1,0,1,1
DATA 1,-1,0,1,2
DATA -1,-1,0,1,1
DATA -1,1,0,1,2

transform:
FOR i=0 TO nball
xo(i)=q(0,0)*xa(i)+q(0,1)*ya(i)+q(0,2)*za(i)
yo(i)=q(1,0)*xa(i)+q(1,1)*ya(i)+q(1,2)*za(i)
zo(i)=q(2,0)*xa(i)+q(2,1)*ya(i)+q(2,2)*za(i)
NEXT i
sx=xo(0):sy=yo(0):sz=zo(0)
qx=sx:qy=sy:qz=sz-1
dq=SQR(qx*qx+qy*qy+qz*qz)
   qtree:
GRAFRECT 0,0,SCREENWIDTH,SCREENHEIGHT
CLG 1
HIDEMOUSE
FOR ix=0 TO 256 STEP 64
FOR iy=0 TO 128 STEP 64
m(0)=1
n(0)=nball:FOR i=1 TO nball:b(0,i)=i:NEXT i
d=1
m(d)=1
WHILE d>0
    WHILE m(d)<=4
        empty=FALSE
        WHILE empty=FALSE AND d<=5
            n(d)=0
            cx(d,m(d))=cx(d-1,m(d-1))+o(d)*sx(m(d))
            cy(d,m(d))=cy(d-1,m(d-1))+o(d)*sy(m(d))
            xo=(ix+cx(d,m(d))-160)*de
```

transformed co-ordinates, and the number of spheres present in the different quadrants. These matrices also keep track of where we are in the tree and determine how a quadrant is split into smaller ones. Certain elements and variables are also initialised here, including the zoom factor. Increase this for enlarged, close-in views; decrease it for smaller, more distant views.

shades: This sets the colour registers and creates a range of shades of red and blue. You can experiment with these to obtain different shading gradations, or even to create a more finely graded range of shades of a single colour.

observer: The position of the observer is set by variables a and e. They represent, in degrees, the azimuth and elevation angles of the observer (see Figure 5). Experiment with different values of these and notice the effect. The matrix which transforms the actual co-ordinates of the scene into the observed co-ordinates of the observer's frame of reference is then created. Note that in the actual co-ordinate system, the Z co-ordinate is the vertical dimension.

light: Similarly, la and le are the azimuth and elevation angles of the light source, also set by the user. Again, try experimenting with different values of these parameters. The ambient light level, amb, is defined in this block and can be set by the user in the range 0 to 1. It represents the level of background light present and would be 0 in deep space, but nearer .2 in a more normal environment.

spheres: The number of spheres is read here, followed by the co-ordinates of their centres, then their radii and colours.

transform: This routine computes observed co-ordinates using the transformation matrix and pre-calculates some constants used later in the plot subroutine to determine the intensity of a point on the surface of the sphere nearest the observer.

qtree: Because the ST's screen is not square (in terms of the number of pixels it contains) we cannot apply the algorithm in a single pass. Instead, we treat 64-pixel square areas one at a time. This allows us to cover 320 pixels horizontally and 192 vertically in a 5x3 pattern, which is the whole screen except 8 scan lines. This block contains the main loop

```
yo=(iy+cy(d,m(d))-96)*del
        FOR i=1 TO n(d-1)
        j=b(d-1,i)
        dist=SQR((xo-xo(j))*(xo-xo(j))+(yo-yo(j))*(yo-yo(j)))-rod(d)-rd(j)
        IF dist<0 THEN n(d)=n(d)+1:b(d,n(d))=j
        NEXT i
        IF n(d)=0 THEN empty=TRUE
        IF empty=FALSE THEN d=d+1:m(d)=1
      WEND
      IF d=6 THEN GOSUB plt:d=d-1
      m(d)=m(d)+1
   WEND
   d=d-1:m(d)=m(d)+1
WEND
NEXT iy
NEXT ix

finish:
a=GET
SHOWMOUSE

END

plt:
cx=cx(d-1,m(d-1)):cy=cy(d-1,m(d-1))
FOR i9=-0.5 TO 0.5 STEP 1
FOR j9=-0.5 TO 0.5 STEP 1
xo=(ix+cx+i9-160)*del
yo=(iy+cy+j9-96)*del
imin=0:zmin=100000
FOR i=1 TO n(d-1)
j=b(d-1,i)
distsq=rd(j)*rd(j)-(xo-xo(j))*(xo-xo(j))-(yo-yo(j))*(yo-yo(j))
IF distsq>0 THEN
     zz=zo(j)-SQR(distsq)
     IF zz<zmin THEN zmin=zz:imin=j
ENDIF
NEXT i
IF imin>0 THEN

     xn=xo-xo(imin):yn=yo-yo(imin)
     zn=zmin-zo(imin)
     coth=(xn*sx+yn*sy+zn*sz)/rd(imin)

     IF coth<=0 THEN
          nt=amb
     ELSE
          shadow=FALSE
          FOR i=1 TO nball
          IF i<>imin THEN

               xm=xo(i)-xo
               ym=yo(i)-yo
               zm=zo(i)-zmin
               dm=SQR(xm*xm+ym*ym+zm*zm)
               dmcoph=(xm*sx+ym*sy+zm*sz)
               coph=dmcoph/dm

               IF coph>0 THEN
                    IF dm*dm-dmcoph*dmcoph<rd(i)*rd(i) THEN
                       i=nball:shadow=TRUE
                    ENDIF
               ENDIF
          ENDIF
          NEXT i

          IF shadow=TRUE THEN
               nt=amb
          ELSE
               coal2=(xn*qx+yn*qy+zn*qz)/(dq*rd(imin))
               coal=2*coal2*coal2-1
               nt=(1-amb)*coth+amb
               IF SGN(coal)*(coal^100)>0.5 THEN nt=(9-epsilon)/(8-epsilon)
          ENDIF
     ENDIF
     lamda=INT((8-epsilon)*nt)
     col=colr(c(imin),lamda)
     MARKCOL col
     PLOT INT(ix+cx+i9),195-INT(iy+cy+j9)
ENDIF
NEXT j9
NEXT i9
RETURN
```

which performs the quad-tree traversal for each of these areas.

The structure within the loop follows that described earlier (I apologise for the use of shorter, different, variable names from those used in the outline code description) but since we are starting with 64-pixel regions there are more levels to the tree. Initially, all spheres are considered as candidates for intersection with these regions. As the next level of quadrants is generated and examined, this list is scanned for intersections with the new quadrant and only those spheres which do intersect are included in the list at the current level. As we descend the tree the list tends to diminish. If it ever becomes empty (n(d)=0), that quadrant is empty and we can move to the next. The test is made by calculating the distance between the centre of each sphere and the axis of the bounding cylinder. If that distance is greater than the cylinder's radius plus the sphere's radius then there is no intersection (see Figure 6).

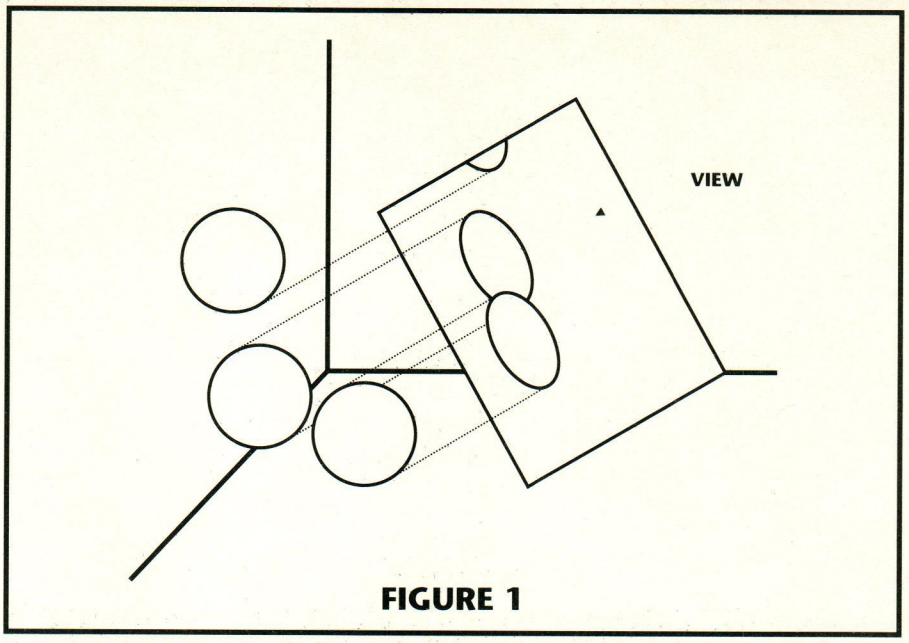

FIGURE 1

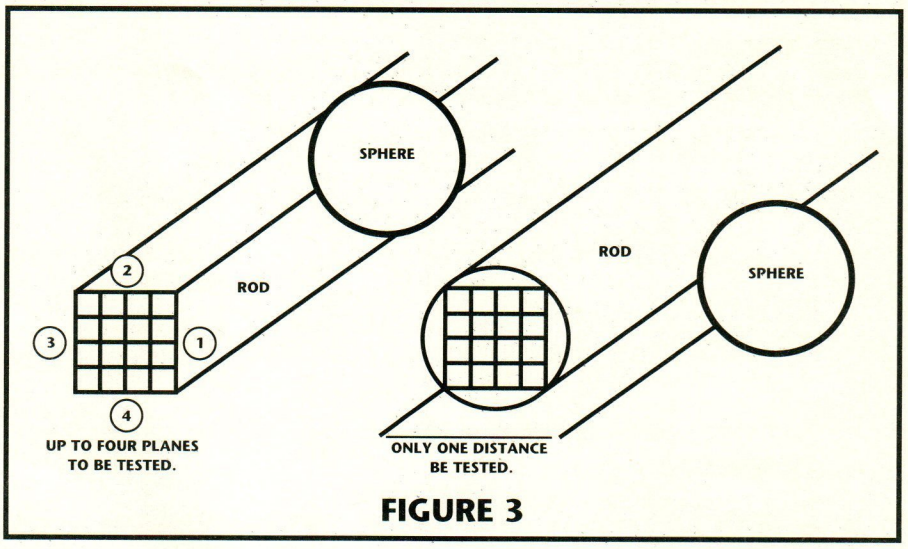

FIGURE 3

finish: This simply waits for a key-press (after you have finished admiring the screen image) and ends the program.

plt: This is the subroutine which calculates what to plot and is only called when a 2x2 quadrant at the penultimate level of the tree is thought not to be empty. For each of the 4 pixels in this quadrant it first finds the intersection of each sphere with the line passing through the centre of the pixel (or determines that there are no intersections) and identifies the sphere nearest the observer. The direction of the normal to the sphere at this point is then calculated. (The normal is the imaginary line which is perpendicular to the surface of the sphere at any particular point). This is used to calculate the intensity of the light at that point arising from both diffuse reflections (in which a point is brighter the more directly it faces the light) and from specular reflections (where a point is brighter the nearer it is to the path of the ray from the light to the eye by reflection from the sphere - the highlights which you see). The point may be in shadow either because it is on the side of the sphere facing away from the light or because other spheres are intercepting the light.

Whilst the calculation of these

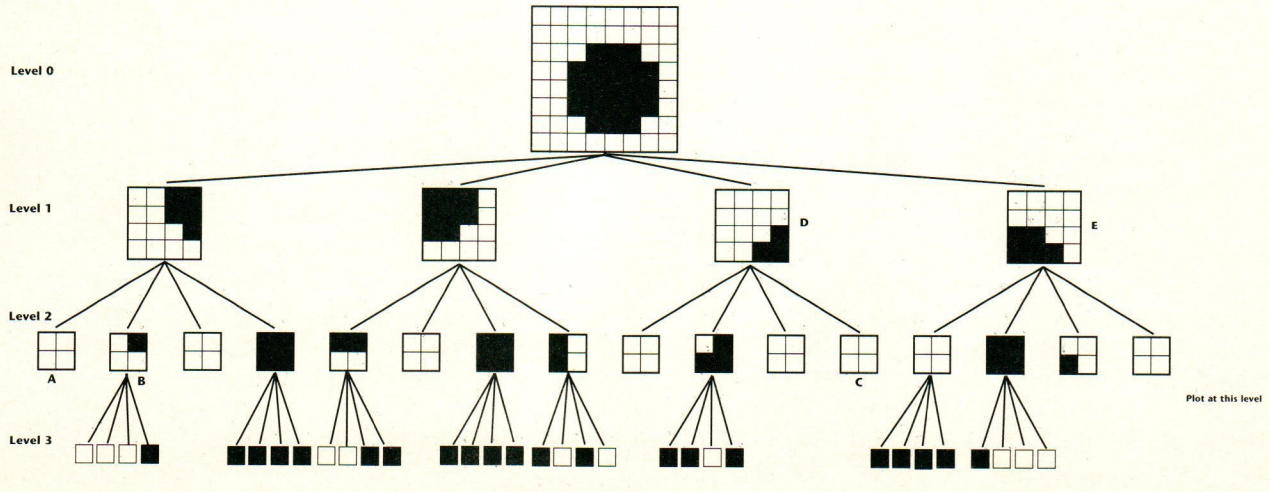

FIGURE 2

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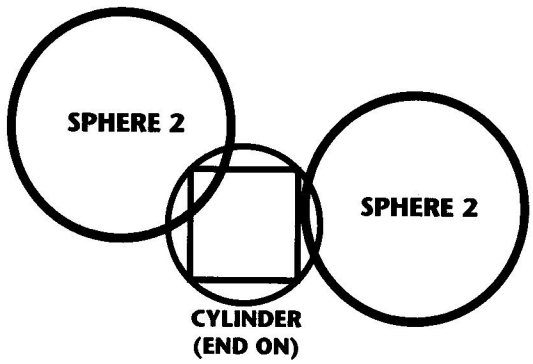
factors is accurate, I have cheated in the way they are used to create the image. The proper approach would be to average the diffuse and specular components in some way, but doing this would reduce the number of shades over the non-highlighted parts (practically the whole of the sphere's surface) leading to a coarser, less realistic, shading. So instead, the diffuse component is used alone except in the highlight regions, and this results in smoother shading.

Within the limitations of the resolution and range of shades available on the ST, realistic images of spheres can be produced using this technique. Try experimenting with different colours, light and observer positions to assess the possibilities. Experiment also with the number and sizes of the spheres. They may even overlap to produce complex shapes suggestive of molecular models, such as those generated by the following data :-

```
DATA 9
DATA 1,1,1,1,1
DATA 1,1,-1,1,1
DATA 1,-1,1,1,1
DATA 1,-1,-1,1,1
DATA -1,1,1,1,1
DATA -1,1,-1,1,1
DATA -1,-1,1,1,1
DATA -1,-1,-1,1,1
DATA 0,0,0,2,2
```

If you are feeling really ambitious, you can enhance the program to deal with other shapes, such as cylinders and planes (although this will involve more complex intersection tests). Also, try introducing perspective into the program - in this case you will test for cones centred on the observer, not cylindrical rods. You could even extend the program to save your images. Please write to ST World with any improvements you make and send in the data for any interesting images, or the screens themselves if you have included the facility to save them. END



Sphere one intersects square rod and cylinder.
Sphere two misses square rod but intersects cylinder and further processing is needlessly carried out (but is quicker overall).

FIGURE 4

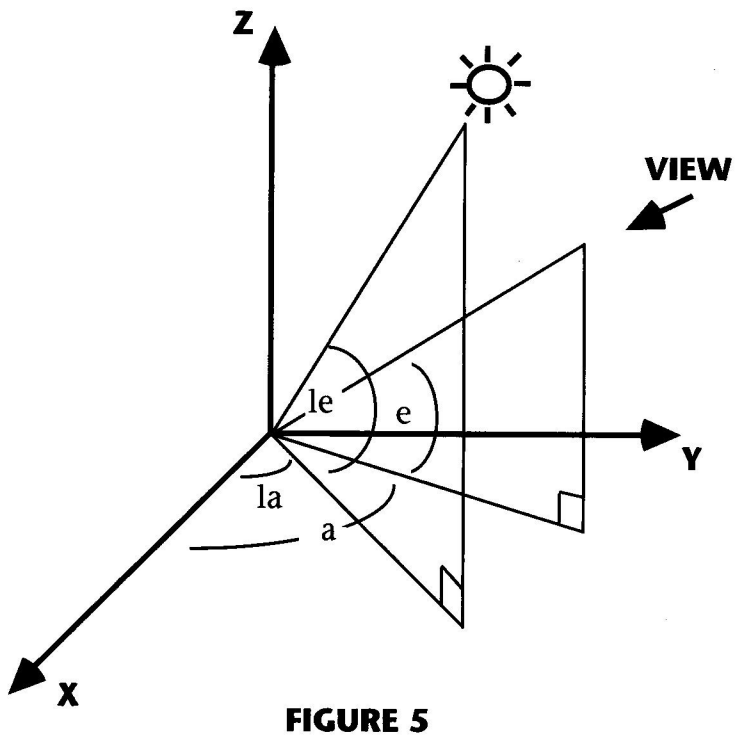
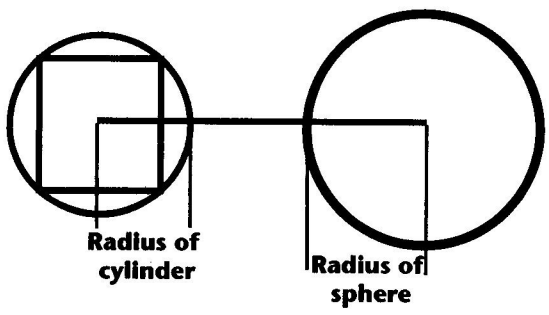


FIGURE 5



There is no intersection if seperation is greater than the sum of the two radii.

FIGURE 6

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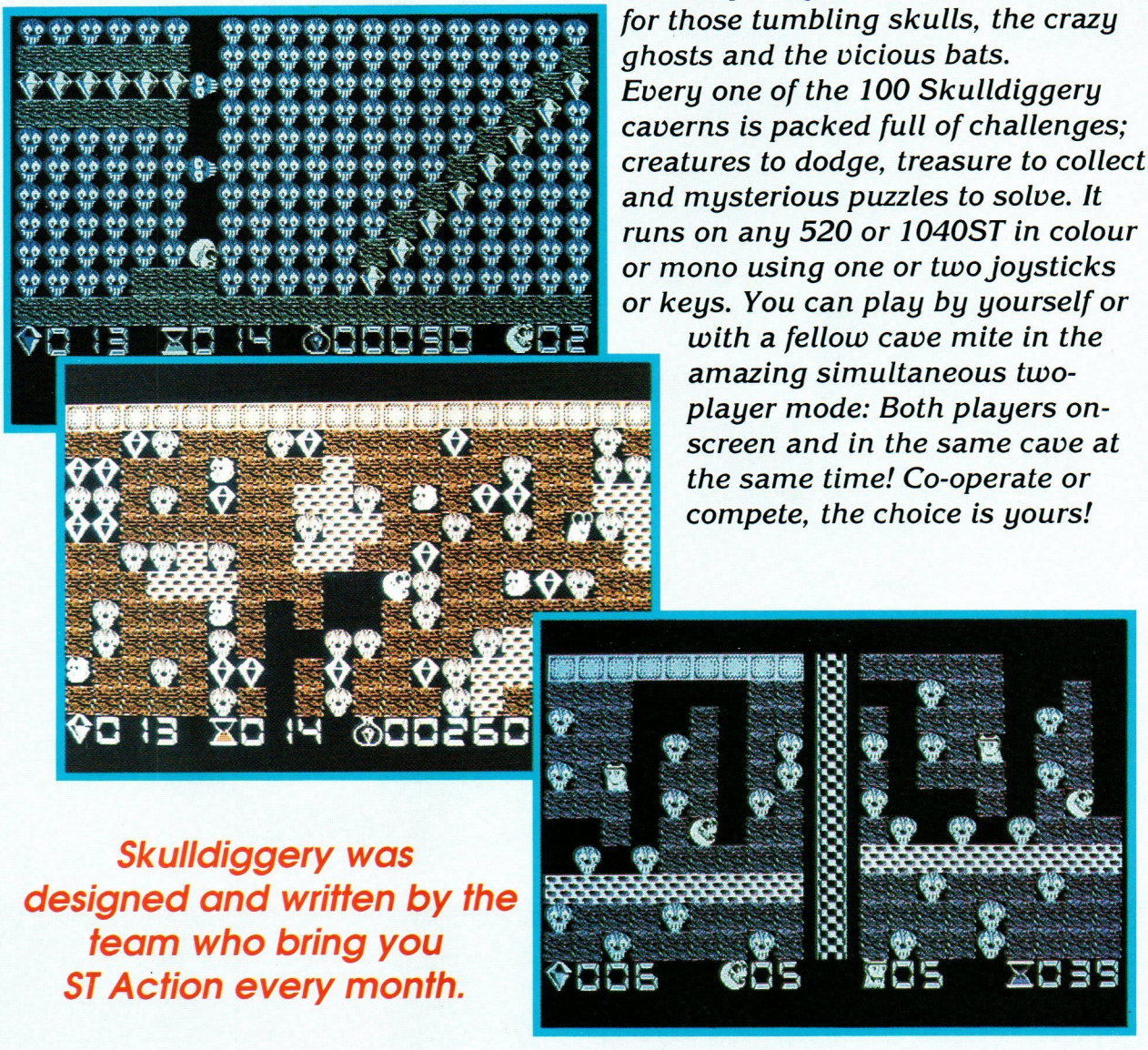

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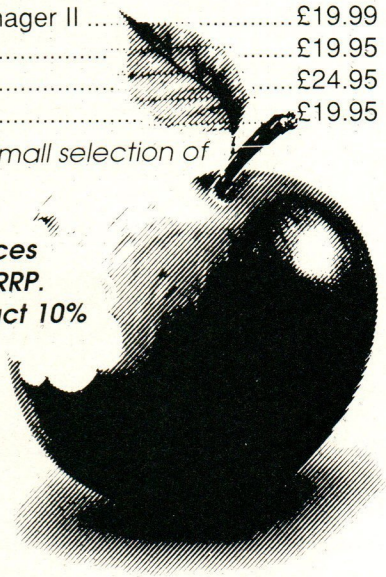

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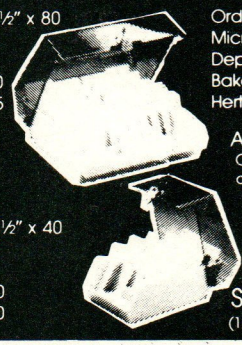

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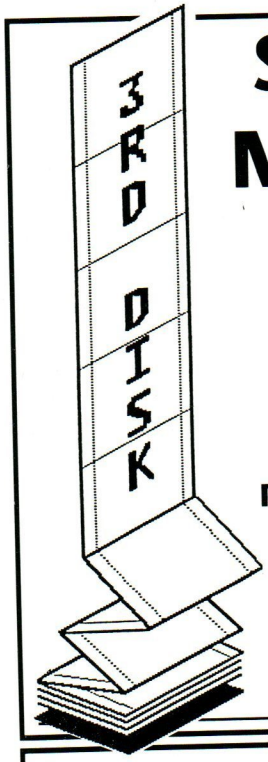

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Picture Dumper	Paul Hellier	Issue 21 page 90	Fast Basic
Menu Demo	J H Taylor	Issue 22 page 92	Hisoft Asm
Plinker	Mark Annetts	Issue 23 page 88	GFA Basic
Grabber	J M Millar	Issue 24 page 109	Fast Asm
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Encryptographer	Aston Fong	Issue 24 page 98	Fast Basic
Viewtree	David Roberts	Issue 26 page 104	Fast Basic
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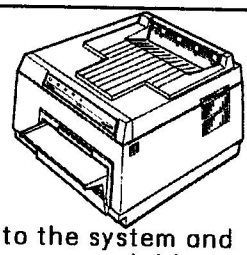

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