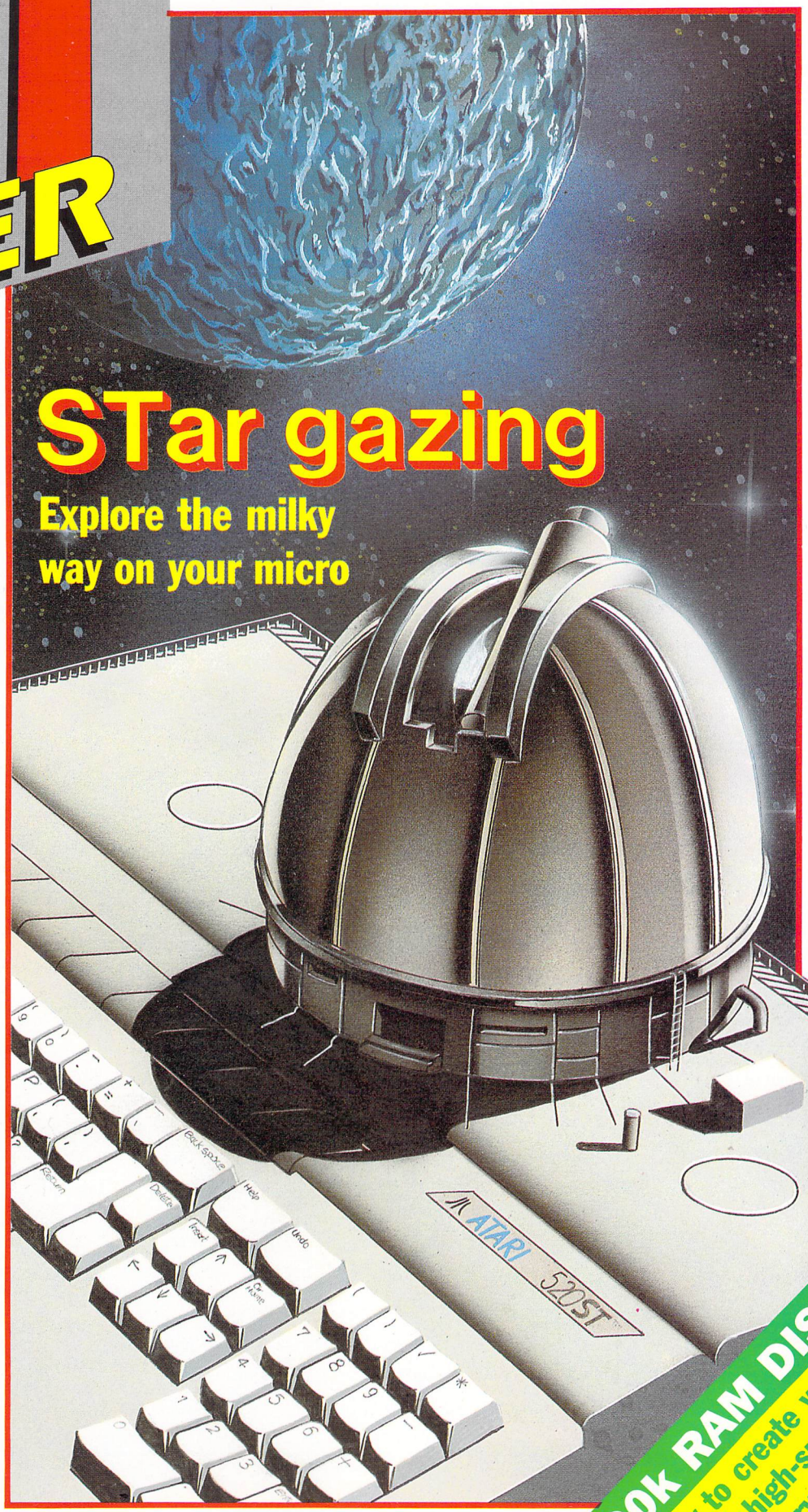
ATARI ST USER

The top-selling Atari ST magazine

Volume 3
Number 5
July 1988
£1.75



STar gazing

Explore the milky way on your micro

NEW SERIES

Arcade Corner: Full solution and map of Terramex

REVIEWS

On test: AB Animator, Quantum Paint, Juggler, GFA Artist, Superbase Pro, K-Expert and Panasonic printers

LANGUAGES

Evaluated: OSS Pascal and Talent Lisp

GAMES

Northstar, Out Run, Rolling Thunder, Foundations Waste, Impossible Mission II, BMX Simulator, Trantor, Road Wars, Spidertronic, Buggy Boy, Bob Winner, Power Struggle ...and many more!

500k RAM DISC
How to create your own high-speed memory store

Canada $4.95

The year is 1987; Robin, an 11 year old boy with phenomenal psychic powers is in a trance. His mind has left his body and travelled through time, taking him to a post-holocaust Southampton ruled by Fascist forces — The System.

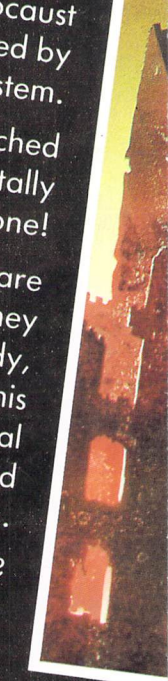
Everywhere is bare, scorched and desolate. He is totally alone!

The friends he left behind are powerless to help him as they stand over his inert body, watching transfixed as his fluorescent green eyes reveal like a TV screen the horror and devastation of his surroundings.

Will Robin survive?

Can he blow up the enemy generator, defeat The System, free the prisoners and return to the present?

He has just 24 hours to save the world!



NEW FEATURES

- Icon driven
- Intelligent interactive characters
- Full OOPS command
- Optional RAM save all versions
- Auto door opening
- Full graphics all versions
- Extremely user friendly
- Full D & D combat sequences

ADDITIONAL EXTRAS INCLUDED:
A FULL COLOUR A3 POSTER OF MINDFIGHTER, PLUS A 160 PAGE PAPERBACK VERSION OF THE STORY

C64/128 Disk	19.99
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ZX Spectrum 48k/128k/+ Cassette	14.99
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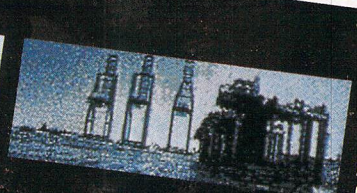
Atari ST	24.99
Amstrad PCW	24.99
Amiga	24.99
MS DOS	29.99

MINDFIGHTER — THE FIRST OF A NEW GENERATION OF ACTI

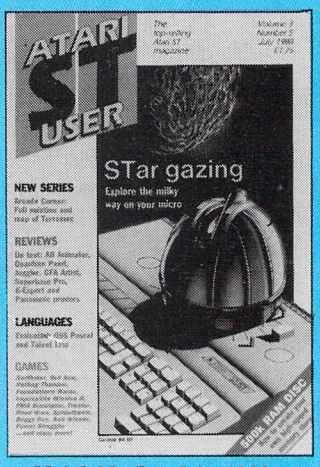
A flight into a nightmare– MINDFIGHTER



Mindfighter storyline and concept © 1987 Strange Obsessions. Mindfighter computer game © 1988 Activision Inc. Marketed and distributed by Activision UK Ltd. Atari screens shown.

N-PACKED ADVENTURE GAMES

ABSTRACT CONCEPTS



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Writing for Atari ST User: Articles and programs relating to the Atari ST are welcome. Articles should preferably be typed or computer-printed, using double spacing. Unsolicited manuscripts, discs etc, should be accompanied by a self addressed stamped envelope, otherwise their return cannot be guaranteed. Unless agreed otherwise, material is accepted on an all rights basis.

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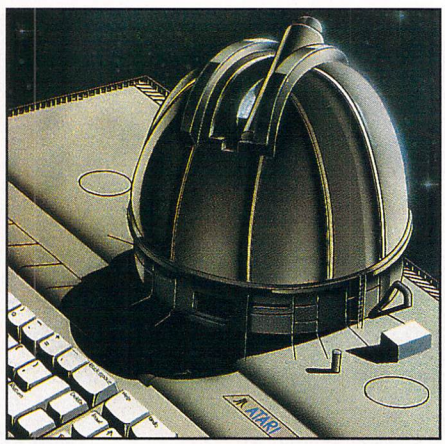

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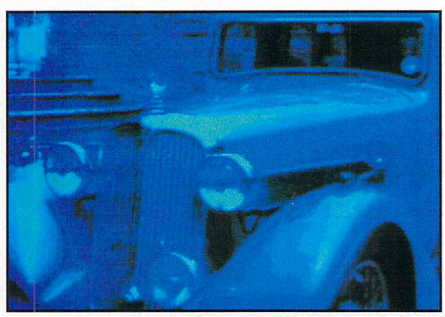

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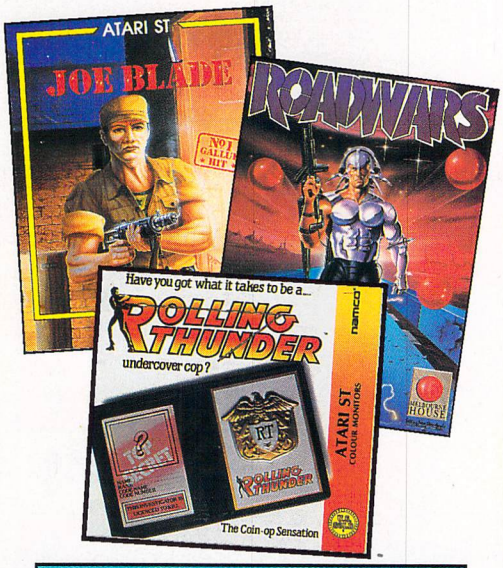

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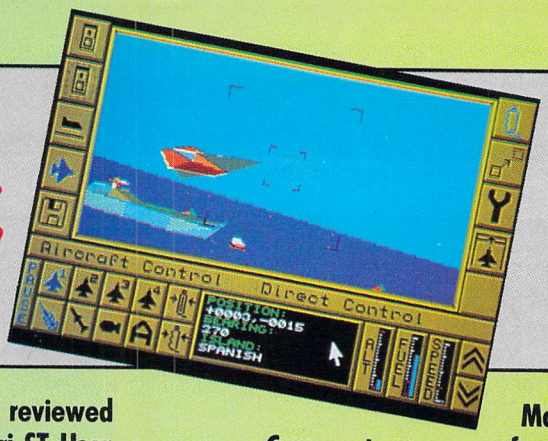
NEW YORK Chance of a lifetime! NEW YORK

Fancy two free air tickets to New York, three nights at the fabulous New York Hilton – plus £200 spending money? The final questions in our £4,000+ contest are on page 76.

Gallup Software Chart



This month	Last month	Title (Software House)	Price	Month reviewed in Atari ST User	Comments	Marks from 10
1	▲2	CARRIER COMMAND *Rainbird*	24.95	June	The action is brilliantly executed using solid 3D graphics. Combine this with the complex strategy, and you've got a real winner.	10
2	▼1	DUNGEON MASTER *Mirrorsoft*	24.99	May	The animated graphics and spot sampling effects make this quest worth dusting off your codpiece for A superb role playing game.	9
3	▲19	OBLITERATOR *Psygnosis*	24.99		This is the long-awaited new one from Psygnosis with the usual excellent packaging artwork from Roger Dean.	*
4	◀4	GUNSHIP *Microprose*	24.95	May	Gird your loins for the ultimate flying combat experience. There is only one word for the ST version of Gunship. Awesome.	9
5	▼3	IKARI WARRIORS *Elite*	14.95	June	If you're the type of guy (or gal) who thrives on danger, and surmounts insurmountable odds, this is for you. The ultimate combat game.	9
6	▼5	XENON *Melbourne House*	19.99	May	An absolute must and deserves a place in every arcade game collection for anyone looking for the ultimate fast action shoot-'em-up.	10
7	●	CAPTAIN BLOOD *Infogrames*	24.95	April	An excellent game in its original French form. The English conversion has been significantly improved, and is now even better.	10
8	●	ARCADE FORCE FOUR *US Gold*	24.99		With four contributions from Gauntlet and the Deeper Dungeons, Metrocross, Road Runner and Indiana Jones.	*
9	▲10	OIDS *Mirrorsoft*	19.95	June	At first sight a simple budget-quality offering – but it grows on you the more you play this update on the older lunar lander type game.	8
10	▼7	BLACK LAMP *Firebird*	19.95	April	Fast, fun and very addictive with the background and large sprites drawn in fantastic detail. The music is among the best we've heard.	9
11	▼6	TEST DRIVE *Electronic Arts*	24.95	May	A series of beautifully detailed screens illustrate the cars of your dreams. Graphically attractive, exciting to play and very realistic.	8
12	▲17	INTERNATIONAL SOCCER *Microdeal*	19.95	June	Sets out to provide a football game as entertaining and skilful as the real thing – it comes close to achieving these goals.	8
13	●	SCRABBLE DELUXE *Leisure Genius*	19.95	June	The latest computer version of this game makes full use of the increased processing power and memory of the ST to make it the best to date.	8
14	●	FOOTBALL MANAGER *Addictive*	14.95	June	It allows you to sample the thrills and spills. Totally absorbing, get yourself a copy – it's better than the real thing.	9
15	●	ROAD WARS *Melbourne House*	19.95	July	Join our reviewers this month in their fight to clear the space highways circling the Moon of Armageddon. Fast 3D action.	8
16	●	REVENGE 2 *Mastertronic*	9.99		They're back, but better than ever? Watch out for our reviewers' thoughts on this new one. A revamp of Llamasoft's original.	*
17	●	BMX SIMULATOR *Code Masters*	14.95	July	Join the Codemaster trail with this new simulator for the Atari ST. Read our riders' comments in this issue. Just like the real thing.	9
18	●	LEATHERNECK *Microdeal*	19.99		Another long-awaited new release, this time from Steve Bak. The goal is simple – to survive in yet another Vietnam-type shoot-'em-up.	*
19	●	POOL *Mastertronic*	9.99		Budget house Mastertronic is starting to release more games for the Atari ST – Pool is its latest.	*
20	●	FLINTSTONES *Grand Slam*	19.95		Fred now makes his way to your screens coping with prehistoric DIY and dealing with a mischievious Pebbles with help from Barney.	*

It's Atari's bundle of summer fun

ATARI has shaken the UK computer trade out of its traditional summer doldrums with what it calls "the biggest promotional campaign ever devised for the home computer market".

Throughout the summer months until September 1, Atari is giving away 22 quality games worth £414 with every 520STFM purchased.

The Atari 520STFM system currently costs £399.99 following its recent £100 price rise due to the world shortage of dram chips.

The free software – which includes hits like Defender of the Crown, Enduro Racer, Marble Madness and Supersprint – comes on 15 discs with a 56-page user manual.

Atari has even thrown in a joystick.

Although some dealers fear the bundle will affect software sales, Atari disagrees.

The company believes the country's existing 120,000 ST owners constitute a big enough market on their own, and

argues that ST sales would be much lower this summer if the special bundle had not been marketed.

Atari sales manager Paul Welch said: "I don't believe the 520STFM promotion affects anyone's ability to sell software.

"In autumn, when software sales start to pick up, dealers will get the benefit of a much bigger ST user base".

ST power puts Atari in front

BY the end of the year Atari expects to be the biggest manufacturer of micros and video games in the world – and it's all been made possible by the ST.

"The last three years since the introduction of the 520 ST has seen "astonishing growth," said an Atari spokesman.

"When the 520 ST was launched it offered twice the power of most other personal computers and had the graphics capabilities of machines at five times the price.

"By following this sort of philosophy, the company has gone from strength to strength, expanding from dominance in the video entertainment market into business systems with products like the Mega ST range.

"By the end of 1988 Atari plans to introduce even faster, more powerful machines including multi-user systems and personal workstations to take the office into the next decade".

Chilly challenge

NEW from Elite (0543 414188) is Beyond the Ice Palace – "a magical game of fantasy which tells of the battle between good and evil".

The "battle" comes as the player tries to rid a forest of its less desirable residents.

Goblins and other assorted ill-favoured creatures provide the opposition, and the player can summon weapons and a good spirit to his assistance in moments of crisis. Price £14.99.

Now DTP can really spread itself

POPULAR desktop publishing package Fleet Street Publisher from Mirrorsoft has made its debut on the big screen.

Visitors to the Atari User Show were first to see how the Megavision A3 monitor from French manufacturer Microvision enables users to display and work on a complete A4 double-page spread.

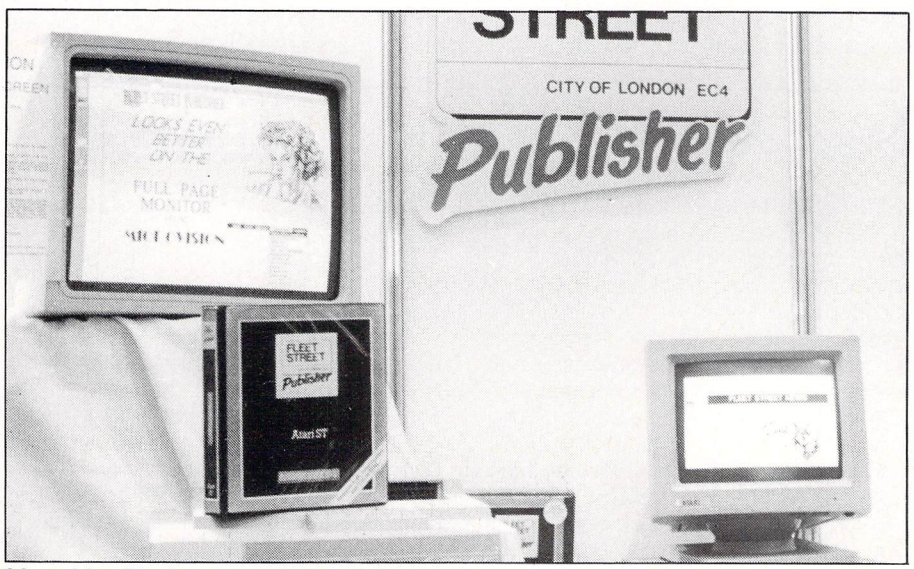
By connecting the Megavision and a standard Atari 125 monochrome monitor, the two screens can be used as separate – but linked – windows.

Text galleys can be made up and edited in a .TXT window on the small screen, then pasted directly on to the page on the A3 screen in a .PAG window.

Users can even run a different program – such as graphics, spreadsheet or database – on one screen, save an .IMG file from there and paste it directly into the Fleet Street page window on the other screen.

The mouse cursor travels freely between the two screens and can be accelerated by a factor of five. The driver program allows the menu bar to be called up anywhere on the page.

Mirrorsoft (01-377 4645) says the Megavision system works with all ST software which uses Gem correctly, and should be available in the UK within a few weeks. Price is expected to be around £1,100 for the 24in monitor and £500 for the video processor card.



Megavision A3 . . . and standard monitor

WEATHER PICTURES QUALITY BOOSTED

A MUCH enhanced WeatherLink service specifically for Atari ST users has been launched on MicroLink.

The result is a dramatic improvement in the quality of satellite weather pictures and the speed at which they can be downloaded.

MicroLink's top programmers worked for months to produce brand new machine-specific software which has reduced download time by up to 75 per cent.

A specially designed data compression technique incorporating full error correction provides pictures three times sharper than before.

Colour resolution has been considerably heightened, making the weather maps easier to understand. The new WeatherLink graphics standard for ST machines is 320 x 200 pixels.

For the first time, instead of a kaleidoscope of colours only a professional meteorologist could interpret, WeatherLink users will see a rationalised and more comprehensible picture.

There are 16 colours available in low resolution. Monochrome weather maps are high resolution.

Soon to be included in the ST software is a facility to redefine the colours, choosing from a palette of 512.

Features to be added later will enable ST users to save pictures in Degas or Neochrome format.

WeatherLink uses data from a range of satellites – notably those in the NOAA system – which provide for the best quality picture definition. The pictures are updated every 24 hours.

Although MicroLink (0625 878888) has the facility to put up maps of anywhere on the globe, initially only the British Isles and nearby parts of the continent will be covered.

Feedback from WeatherLink users will decide which additonal geographical areas are covered in the future.

Interactive games coming

INTERACTIVE movies from Cinemaware (01-377 4837) are heading for the ST's screen in the not too distant future.

The Three Stooges is the company's first offering to be based on a board game format – 180 squares represent Stoogeville, and landing on a square can set some very odd events in motion.

The objective is to earn enough money to save the local orphanage from evil banker Mr Fleecem – but there's a time limit to contend with.

Money can be earned in a variety of ways, from joining in a cracker eating contest against an oyster to working in a restaurant, a job which turns into a pie throwing contest.

Equally offbeat is Rocket Ranger, inspired by the adventures of Flash Gordon, Indiana Jones and the rest.

As Tom Cody, the Rocket Ranger of the title, all you've got to do is save the world of 1940 from Nazi domination – with a little help from friendly scientists in the 21st century, who provide a rocket suit and a ray gun.

Both games feature quality graphics, animation and digitised sound and will be released later in the year.

Price £24.99 each.

Tools of the trade

FTL Tools for the ST is now available from HiSoft (0525 718181) and should prove an invaluable aid for serious programmers.

The package includes HiSoft Wercs, a flexible resource editor which works in low, medium and high resolutions, allows automatic naming of objects and features an integrated image/icon editor.

FTL Tools also has a source-level debugger which allows the user to step source code display a line or a procedure at a time and to view variables while debugging.

And the Make utility will compile only the minimum files needed to remake a program – and doesn't need to reload the compiler for multiple compilations.

Price £39.95.

Lisp lopped

THE artificial intelligence language for the ST – Cambridge Lisp – from Metacomco is down in price by £60.

Tony Bassett, Metacomco's sales manager, said: "We have reached saturation point for sales to specialist end users. The new price should appeal to people who want to experiment with artificial intelligence on the ST".

Dealers who currently hold stocks will not lose out. Metacomco (0272 428781) says that it will give a free copy of the program for every one that dealers sell at the new price.

"No doubt we could still sell Cambridge Lisp for £149.95 but we wanted to add excitement to the market", claimed Bassett.

ST shopfront

SEVEN John Menzies stores are to take delivery of Atari STs on a trial basis.

The decision was taken after an inconclusive trial run in the group's Prince's street Edinburgh store last November.

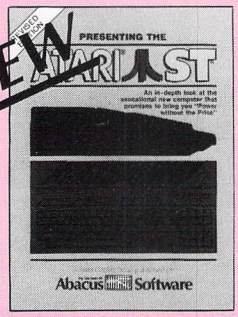
"Although the ST did not make much of an impact in the earlier experiment, we felt that it was due to the state of the computer market generally rather than the quality of the product", said Menzies' merchandise manager, Bill Jones.

"It has consistently been our policy to try out products that become available and appears to be in our line.

"For that reason we will be taking the Atari ST summer pack in seven of our stores which include branches in Edinburgh and Glasgow", he said.

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**

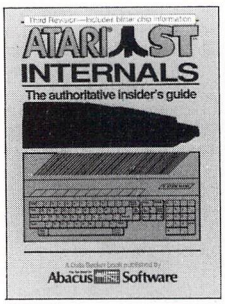
GFA BASIC

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**

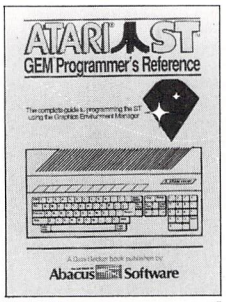


ST Internals

(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.

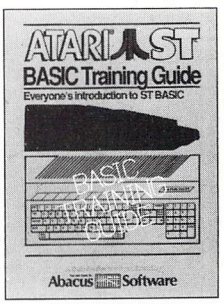
BKAB 450 446 pages **£14.95**



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

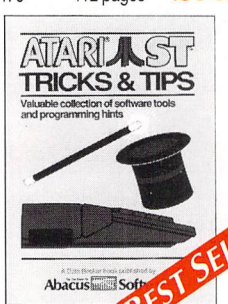
An educational, well-written introduction to Atari ST BASIC. You'll learn to program your ST quickly with the BASIC commands, problem analysis, and algorithms presented in the first few chapters. Quizzes throughout the book help you learn to think in BASIC while you get a practical grounding in the language 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**

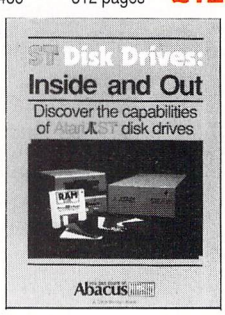


BEST SELLER

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.

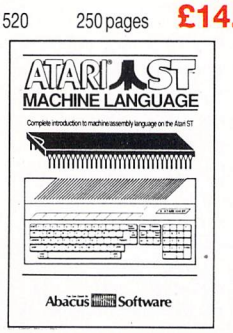
BKAB 455 260 pages **£14.95**



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**



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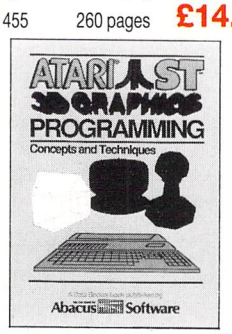

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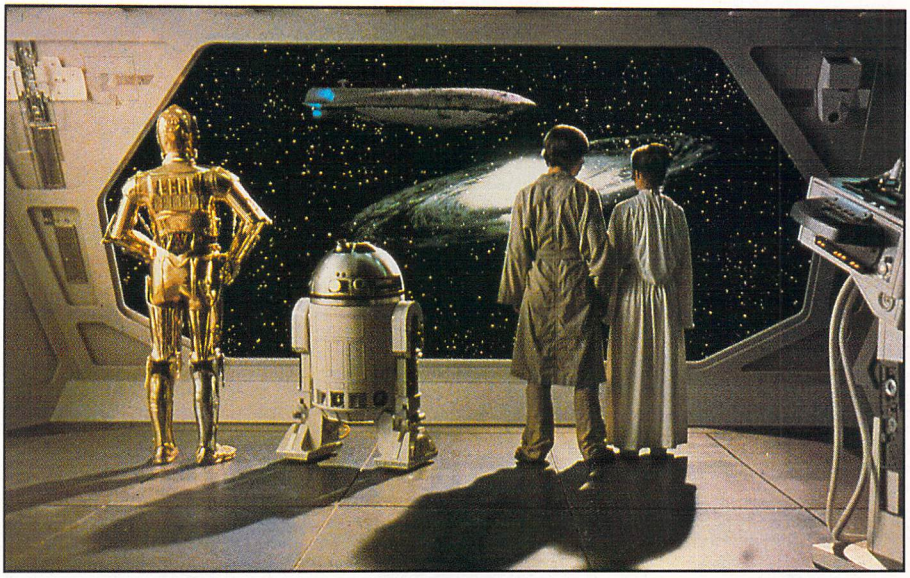


Skywalker fights again

STAR Wars the movie eventually spawned Star Wars the coin-op for Atari – and Domark's bestselling conversion for the Atari ST.

Now Domark (01-947 5622) is following up its success with the release of The Empire Strikes Back, a one-player game which bears more than a passing resemblance to the movie.

The player controls both Luke Skywalker's snowspeeder and Han Solo's Millenium Falcon and has to battle to safety through four levels of increasing difficulty.

Programmed by Andy Craven and Ciaran Gultnieks, The Empire Strikes Back will be available shortly at £19.95.

Laptop is on the way, says Gleadow

APRIL saw another enormously successful Atari User Show take place at London's prestigious Alexandra Palace. Steve Gold reports the details...

IT was crowded. After a relatively quiet Friday – the first day of the three-day event – the crowds appeared in strength on Saturday and Sunday. Visitors queued for up to two hours to get in and, so as not to disappoint tens of thousands of Atari fans, the organisers kept the doors open an hour longer on Sunday.

The result pleased both fans and exhibitors, many of whom reported record takings.

Atari managing director Bob Gleadow attended the show incognito. Only a few people recognised him, and even less dared ask him for the hot news. *Atari ST User* plucked up courage, however, and discovered that plans are now well in hand for the Atari ST laptop – code-named Stacy by Atari's US development team.

"We hope to have the laptop finished and on sale before the end of the year," said Gleadow. "If all goes well, you could see it on sale around October/November time," he added. Sources at the show suggest a £700 price tag.

On the show floor itself, a lot of interest was expressed in the main Atari feature area, which was occupied by AMS, Electric Distribution, Kuma, Mirrorsoft and SDL – Silica Shop's distributors.

Unfortunately, Mirrorsoft (01-377-4645) wasn't able to show off the famous Atari CD-Rom unit – first announced at the PCW Show last September – due to technical difficulties, but it should be on sale shortly.

Desktop Publishing appears to be the main event for the summer from Electric Distribution (0954-61258). Building on the success of Timeworks' Desktop Publisher for the ST (released late last year), Electric unveiled a version of the package for the Atari PC range.

The £129.95 package offers a wysiwyg display and is capable of creating and editing documents of up to 999 pages.

Over on the HiSoft (0525-718181) stand, ST users got a taste of multi-tasking with the unveiling of Twist, a program switcher for all the ST series.

Its built-in ram disc allows ST users to have up to 14 programs in memory at once – subject to memory limitations. But Twist is much more than a simple ram disc, as David Link of HiSoft explained.

"There are a number of switcher programs available for the ST now, but Twist is the first we've seen that really works reliably with the majority of programs and in all resolutions," he said, noting that the package is one of the cheapest on the market at £39.95.

HiSoft also unveiled three other packages for the ST at the show. Aztec C (£129 and £179) is an ST version of Manx software's C compiler package. Devpac ST2 (£49.95) is the second edition of the popular ST assembler package. Wercs – Wimp Environment Resource Construction Set – is a complete resource editor for the ST. Not bad value for £29.95.

Was the show a success? Database Exhibitions' marketing director Peter Brameld thinks so. "People were coming from as far away as the north of Scotland and were still prepared to queue for two hours to get in on Sunday – that's how popular the show was," he said.

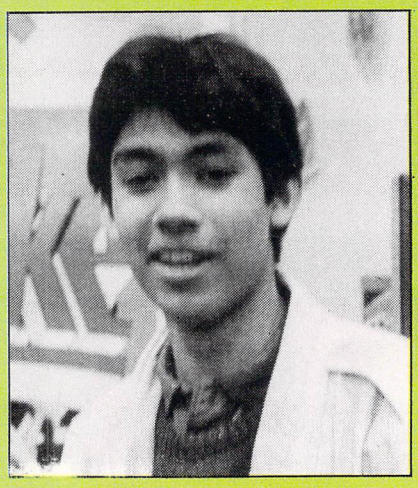
STARQUAKE STAR

WOULD-BE players queued at the Mandarin Software stand to get to grips with a pre-launch version of Starquake – and not all of them came away empty-handed.

Five-star performers racked up huge scores and walked off with complimentary copies of Mandarin's latest bestseller, including James Williams (Norwich), J.P. McManus (Reading), N.R. Fernando (Maidenhead) and Shaun Lygo (Nottingham).

Place of honour, however, went to Oliver Chappell of Maidenhead, who notched up 82,000 points navigating Blob through some of the game's 500 screens.

Starquake, only recently converted for the Atari ST, is available from Mandarin Software (0625 879920) at £19.95.



Oliver Chappell . . . dab hand at navigating Starquake

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Mike Barnes at the controls of the 24-track mixing desk

Guided tour round music mountain

An interview with Mike Barnes, Midi specialist at Yamaha's R&D Centre

SITUATED in the centre of London just off Regent Street, Yamaha's new purpose-built R&D Centre is a musician's dream. It houses a mountain of musical equipment – most, but not all, bearing the name Yamaha – a 24-track recording studio and custom-designed mixing desk.

Mike Barnes – whose official title is Midi product specialist – joined the Centre last December after studying Music Technology at City University. He explained as he showed me around, beginning in the downstairs recording studio:

"The Centre was designed so Yamaha can obtain professional feedback from musicians and Britain is regarded as having the best core of creative musicians anywhere in the world.

"There are three R&D Centres at the moment, one in New York, one in Tokyo and this one. The idea was to span the globe to get feedback so Yamaha can improve their products and create new ones. People who've been here in recent months include Geoff Downes of Asia who came for a three-day evaluation. We got a lot of feedback out of it about how the sequencers and synthesisers work together. What he got out of it was a demo which may be used for a film score he's doing.

"We've also had delegations from Universities researching areas of pro audio. We have close links with City University which is where both I and the engineer studied, but not just for that reason – it's the centre of electro-acoustic music and Yamaha is very much trying to get involved with that side of contemporary music as well as pop music".

MUSIC ON THE ST

By IAN WAUGH

I noticed an Atari ST sitting purposefully in a corner of the studio.

"We run three computers here. We'll be using an IBM PC – which in fact will be an Amstrad – for database applications so that we'll have a record of all the musicians who visit and their particular fields of interest. When we do questionnaires and research we'll know exactly who to contact.

"We have a Macintosh which is used for programming and running the Performer and Composer programs by Mark of the Unicorn. The Mac is used in the Programming Suite upstairs.

"Downstairs we've opted for the Atari ST because we wanted a centralised database for storing all our patches from effects processors, synthesisers, digital mixers, drum machines, anything which can send Midi System Exclusive data.

"Apart from that we're also using it for Dr. T's KCS Level II, a multi-programming environment for Midi. What this means is, you can run the sequencer and various voice editors interactively.

"You can edit the DX7, TX81Z and various Yamaha synthesisers, and all the live editing will be stored in the sequencer so when you play it back the edits are played back as well. This is one of the reasons why we chose the Atari because

as yet the Macintosh is slow to pick up on that kind of software. And Dr. T is very good value for money.

"Also we're currently undergoing discussions with Q Systems who are developing digital mixer editing software which will run on the DMP7, Yamaha's digital mixer. Steinberg have released their DMP7 editing software which is very good.

"We liaise closely with Steinberg and we'll be getting their Pro-24 which is . . . I won't enthuse about it because I don't like it particularly. Dr. T's is an infinitely better program.

"We're also hoping to get Passport Designs' MasterTracks Pro for the Atari which is by far my favourite. Although it's not interactive like Dr. T, as a stand-alone sequencer it's probably the best on the market.

"Dr. T uses the Midi file standard whereas a lot of programs, especially for the Mac, don't. That was important to us. Dr. T steers well clear of Gem which is very good because Gem is a little slow for certain Midi applications, especially when you're editing in real-time. That's another reason why we went for Dr. T.

'We've opted for the Atari ST as we wanted a centralised database...'

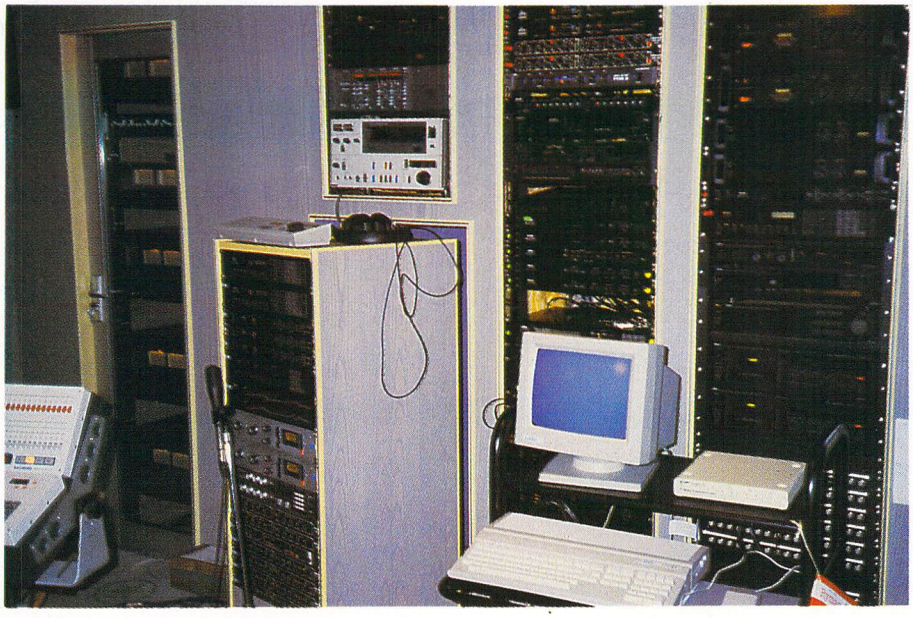
"We're running Jam Factory on the Macintosh. I know that M has just been ported to the Atari. It works the same, but it's a little bit slow. The reason is Gem – it just can't redraw the screen quick enough.

"At some stage we hope to get involved with the Composer's Desktop Project which uses the Sony PCM Digital Encoding System, the Atari Hard Disc system and the 1040 to run various processing software. All the development is going on at York and Keale Universities and that's going to be an exciting area for the ST in the next few years.

"Also, we're hoping to get involved with a new company called Commander Electronics who are marketing the Lynex sampler. Our TX16W sampler is a basic machine, 1.5 Mega bytes expandable up to six, however it's designed as a performance sampler. The Lynex is a production sampler where you can manipulate long sections of music in stereo and Yamaha are quite interested in that.

"The Hybrid Arts ADAP II system is looking very exciting. It's a different approach to the Composer's Desktop Project, it's a more pop-orientated product and we'll be looking at that, too.

"We quite often use the Atari and Mac together. I think it's going to become a more and more common sight in British professional studios".



One of the Midi Workstations in the Centre

The Midi workstations in the Centre

We began to talk about some of the R&D work which goes on at the Centre.

"Recently we've had Steve Howe, Alan Murphy of Go West and various guitarists here, all interested in guitar controllers. The guitar isn't particularly suited to Midi, but Tim Stone demonstrated a Yamaha prototype at Frankfurt. If it becomes a reality the system will be radically new from anything which has gone before".

I heard Yamaha are developing a DAT (Digital Audio Tape)system.

"Yes, it's currently under development, but I don't know any more".

At a pocket money price?

"I don't know about that".

DAT gives CD quality recordings from tape. I decided to hang on to my multi-track tape recorder a little longer as we walked through to another room which contains Yamaha's Assisted Acoustic System. In it is the new Yamaha Midi Grand Piano. Mike explains:

"It's basically a normal piano, but contains optical sensors. There are two beams and when the hammer breaks them it sends out information via Midi. You can set split points and do all sorts of things from the front panel.

"Keale University have just bought one – they're the first people outside R&D to have one – and CBS have bought one as a present for George Michael.

"This particular model is about £11,000. Considering a normal grand costs about £8,000 you're not paying a great deal extra for the optical sensors. It's got aftertouch and a built-in Midi monitor so you can look at the Midi information".

It's in hexadecimal – not very user-friendly.

"No, but it's not really designed for the

Turn to Page 15 ▶

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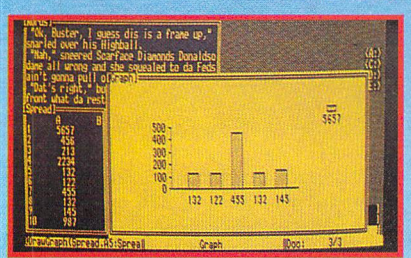

PC-Ditto, the official Euro-version direct from Avant-Garde, allows you to run almost all IBM PC software on your ST! Works in mono or colour. Microsoft mouse emulation included!

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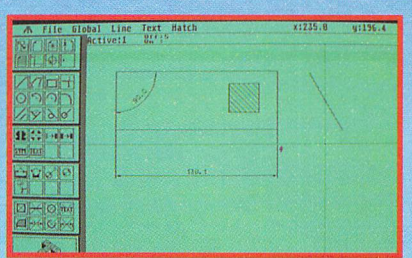

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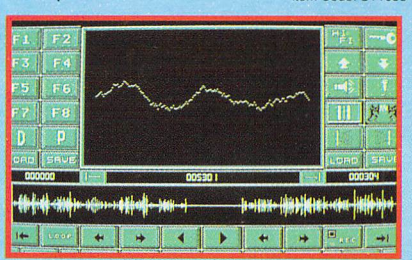

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Creative Computing

Yamaha midi grand piano in the room which houses the Assisted Acoustic System

people who are playing it but for the people who are setting it up. They can switch it on and see what's happening".

What about the Assisted Acoustic System?

"In the panel in the wall there is a rack of processing gear. At the moment it is controlled by a CX7 although it doesn't need to run on a CX7. (The CX7 is a development of Yamaha's CX5 computer and not available in the UK.) *The software is sort of complete but we're running a prototype version. You don't actually need the computer to run it, either.*

"There are presets in this external control panel which let you select various acoustic patterns. The feed is taken from four omnidirectional microphones in the ceiling. The actual positions are as important as the spacing between them – it's critical.

"The information is processed separately by the units in the wall and each of the microphones feeds back the processed information through a separate set of speakers in the wall. You can create huge Churches and multi-effects patterns with delays on each of the speakers".

Mike demonstrates a few quadrophonic ambience effects. Wow!

"We've just used it to record a string quintet. You know what it's like playing in an environment that's dead. They just don't seem to get it together in terms of tuning and actually playing.

"We put the AAS system on a little so they feel comfortable and we close-miked the instruments. We didn't pick up any of the ambience, just the instruments so we got the best sound and best performance.

"Wimbledon Theatre has been very interested in it but whether they'll install one I don't know yet. It's aimed at studios, theatres and concert halls. There are several installations in Japan.

"The only other system which compares with it is the Assisted Resonance System which is installed at the Queen Elizabeth Hall. However, that's very complicated and it's about five times more expensive".

So how much is it?

"Actually, I don't really know. I asked the designer and all he would say is it's a fifth of the cost of an Assisted Resonance System – and I've no idea how much that is. It's not really my field, it's pro-audio".

We go upstairs to the Programming Suite which is full of equipment. I remark that it must be difficult to realise the full potential of some of it.

"The thing to do is limit yourself to say one keyboard, one sequencer and one drum machine and explore that to its full. Once you've explored all the possibilities there you'll know enough to move on and take advantage of multi-timbral stuff.

"At Yamaha we really try to encourage music technology in education. If you don't interest people at that level, at the educational level, then there's no hope for the future as things are getting more and more complicated".

A CX5 was running a Midi Monitor program.

"I wouldn't enthuse about the CX5, but its Midi Monitor is quite good.

"Here in the Programming Suite we mainly program sounds and do sequencing so we don't tie up the studio. We've got two workstations here. They're racked up in quite a logical way so we can easily send stuff downstairs".

You have an interesting job.

"Yes, the R&D Centre is really an interesting and exciting place to be".

It certainly is. I was very reluctant to leave.

Visits to the R&D Centre are by appointment and invitation only and usually reserved for established musicians, engineers and producers. Further information from Eric Atsumi or Mike Barnes at Yamaha R&D Centre, 61 Conduit Street, London W1R 9FD. Tel: 01 434 1336.

Bring yourself up to date

Product: Music Through Midi
Price: £17.95
Supplier: Microsoft Press, Penguin Books Ltd., 27 Wrights Lane, London, W8 5TZ.
Tel: 01-938 2200

THIS large tome was written for those who know little about modern music technology and in its 300 pages you'll find chapters on sound, music and synthesisers. It tells you how to connect Midi equipment together and there's a description of Midi messages. Another chapter is devoted to computers and explains the kind of things Midi software can do.

There are mini profiles of different kinds of Midi instruments, and a profile of the Atari ST which won't tell you anything you don't already know. Sometimes the author's enthusiasm runs away with him. At one point he says, "You can attach as many as two disc drives to the 520ST". Wow!

There's a quick look at some Midi software including, for the ST, Midisoft Studio (available in the UK from Rittor Music) and Dr. T's CZ Patch. Four of the most interesting chapters look at Midi in live performance, in the recording studio, in education and as part of a home set-up.

The book is American and some details are, naturally enough, of more relevance to the American than the UK market. A great deal of the software mentioned is for the Apple Mac and contacts and addresses, very useful items, are all American.

The book was designed for distribution in the UK and a few pages of British names and common British equipment would have made it more valuable.

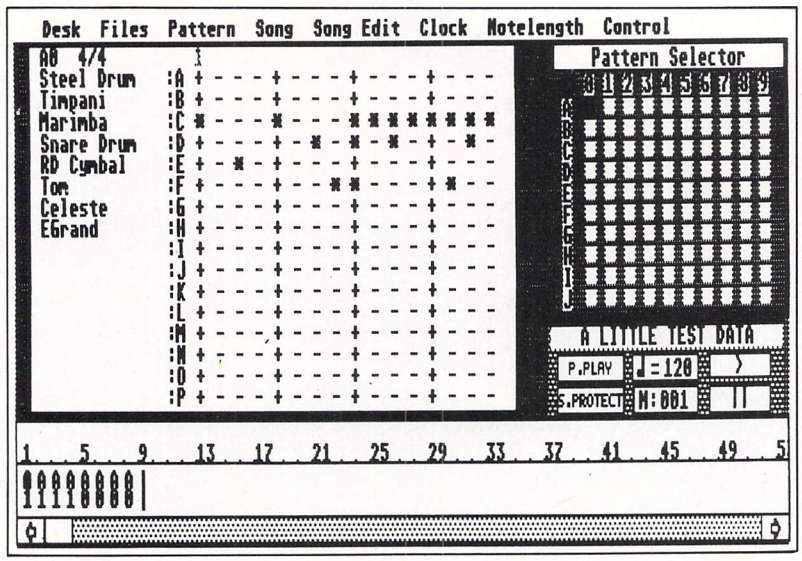
That apart, Music Through Midi covers more aspects of the subject than any other book I've seen. There are diagrams on almost every page and the style is informative.

£17.95 is a lot to pay for a book, especially a paperback, but if you are one of "those who know little about the technology behind today's music" and you would like to know more, it'll be money well spent.

Even if you are well versed in the subject you will undoubtedly find much here to interest you although if it's purely a reference book you're after you could find a cheaper one.

Beat this!

MidiDrummer is given a thorough workout



Midi Drummer's editing screen

HERE'S something a little different – a pattern editor and sequencer for drum machines. It weighs in at a budget price, it's useful and it's British.

MidiDrummer lets you construct drum patterns on screen using a grid format rather like that used by Roland's drum machines such as the TR707, the TR505 and their new TR626. I confess to a liking for this format as it shows exactly where in the bar each drum hit occurs.

The program runs in high or medium resolution and once loaded the screen shows a small pattern selector grid on the right and a large pattern construction grid on the left. It can handle 16 drum voices which are labelled A to P and it can store 100 patterns. These can be chained into eight different songs each containing up to 1054 patterns, according to the display.

The first thing to do is click on the control menu and assign a note number to the sounds on your equipment. These will correspond to the voices, A to P and you can name them so you know what's what.

Each sound on a drum machine is triggered by a particular Midi note number. These can usually be altered on the machine itself, and this information should be available in the manual.

You can also set each sound to receive on a different Midi channel so you can link MidiDrummer to a synth or a sampler. One of the problems with using drum sounds in non-drum instruments has been the lack of a pattern programming facility. MidiDrummer lends itself to use in this way.

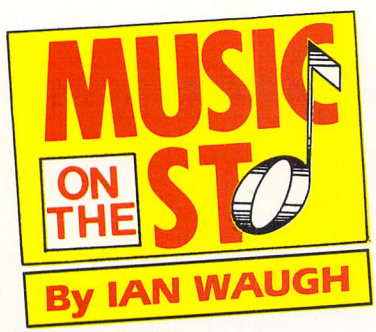
Now it's down to the business of constructing patterns. You simply click on the grid where you want a drum hit to occur and click again to remove it. You can also enter hits in simple real-time fashion with the A to P keys.

Voices can be muted and you can copy a single line or the whole grid from one pattern to another. You can play the pattern while constructing it and I find this helps when trying to create a new rhythm.

One of the program's fortes is its handling of velocity information. You can program 10 default velocity levels for the hits and you can even assign individual levels to each hit. Lots of scope for a human touch here.

Having put together a few patterns, you can proceed to string them together to form a song. The traditional way of doing this is to specify a pattern number and the number of times it is to play. With MidiDrummer you build up a song as a continuous string of patterns which is shown at the bottom of the screen.

While this may appear more cumbersome at first sight, it is very easy to edit and you can see at a glance (with a click or two of the mouse, perhaps) exactly how the song is constructed. There are cut, copy and paste facilities and you can name sections, which is very handy.



When MidiDrummer is running under the internal clock it automatically sends song start, stop and continue messages and position pointer. When under the control of an external Midi clock it will respond to these messages.

The program has a resolution of 32 hits a bar which is adequate for a great deal of music, but you will have problems if you want to mix triplets and 4/4 time, for example. You can enter a time signature of 12/8, but that simply reduces the number of hits per bar to 24. A true triplet approach requires greater resolution – at least 96 divisions a bar.

Further investigation reveals that it allows a time signature of 0/4, but not 6/4 or 3/2 – both of which it turns into 12/8 – and it converts 6/8 into 3/4, sin of sins. Some attention to this is needed but as the program just blocks off unrequired beats it doesn't prevent you from using such time signatures correctly.

Using a finer resolution would require major changes to MidiDrummer and this may be incorporated in an advanced version, but not as an update.

If you want to use your ST to run a sequencing program then you can't use it to run MidiDrummer, too. To overcome this problem, Bit by Bit intend to include a standard Midi file dump in the program which will let you load patterns into those sequencers which support the standard – that's most of the professional ones. This will increase its usefulness enormously and updates will be free to registered users.

So why bother, you may wonder, as your drum machine already has programmable pattern and song chaining facilities. Yes, but I haven't come across one which is intrinsically as easy to use or as much fun as MidiDrummer. It simplifies pattern and song creation, it's ideal for use with synths and samplers, and you can store all your patterns and voice settings on disc.

While MidiDrummer could be improved in some areas it is still a remarkably useful program. If you have to re-read your machine's manual every time you want to program it, MidiDrummer could save you a lot of time and effort, too.

FACT FILE

Product: Software's MidiDrummer
Price: £39.95
Supplier: Bit by Bit Software, 13 Spencer Street, Lincoln, LN5 8JH. (Mail order only)

POINTS FOR:
Easy to use. Ideal for synths and samplers.

AGAINST:
Has problems with some time signatures.

Antic

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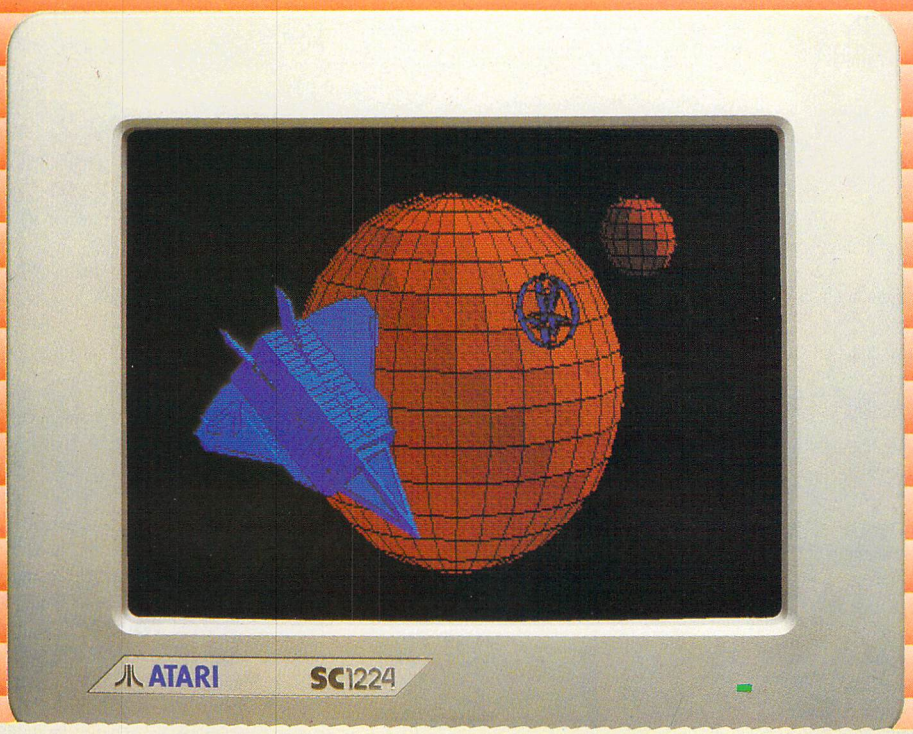

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MUSIC ON THE ST

By IAN WAUGH

Midi hardware on the horizon

News and developments overseas at the recent Frankfurt Music Fair

I BROUGHT you news last month of the wealth of top-notch software at the Frankfurt Music Fair. With such a host of new software for the ST, it's easy to forget the instruments the software drives. There were lots I could have spent weeks playing with, but I'll only mention a few you may like to keep an eye out for at your local music stores.

The friend of the budget-conscious musician, Cheetah, has finally released its MD8 (£149.95) drum machine along with a new set of sounds called the Electro Kit (£9.99). Its MK7VA (£399.95) seven-octave, pressure, velocity and release-velocity sensitive keyboard should now be available too.

And let's not forget the MS6 (£274.95) multi-timbral expander or its MQ8 (£199.95) sequencer. With ST-based software you probably wouldn't want a hardware sequencer, but the MQ8 is being promoted as a performance system and has eight built-in special effects.

Watch out too, for Kawai's easy to edit, multi-timbral K1 synth and K1M expander. At prices of £595 and £395 respectively they could well set new standards in terms of value for money and price vs performance. I didn't spend a lot of time with them, but for a first acquaintance I was impressed.

As soon as you have more than two sets of Midi sockets you will have problems connecting them together. A change of application can mean unplugging and reconnecting cables. Fortunately Philip Rees has developed some more Midi boxes to help with such situations.

The 5X5 Midi Switch and V3 and V10 Thru units are already well-established.

New are the W5 Dual Input Thru Unit (£49.95) with five through outputs and two inputs, the 5S Midi Selector (£25.95) – a simple one to five routing switch – the 2M Midi Merge Unit (around £80), and the MCV Midi to CV Converter (around £170). These are all jolly useful and affordable boxes to have around, and I hope to look at them in detail soon.

Midi isn't perfect. Sacrilege? No, not at all, as anyone who works in the industry will tell you. What it does, it does quite well, but it was never designed to do all the things some people expect of it. In particular it is highly suited to keyboards, but not at all well-equipped to handle other forms of musical input.

We have recently seen the launch of Yamaha's WX7 Midi wind controller and Akai's EWI and EVI sax and trumpet controllers. Casio has now joined the alternate Midi-controller market with their D-100 Digital Horn and PG-380 (£1,299) Midi guitar.

Yamaha was showing its G10 Midi guitar for the first time, and there were several other controllers on show from less well known companies. Softwind Instruments demonstrated a Midi saxophone called the Synthophone. Unlike other sax-type controllers it really is a saxophone. Special fingerings let you select up to 128 presets.

Any harmonica players out there? Then check out the Millioniser 2000 harmonica Midi controller with 64 built-in sounds.

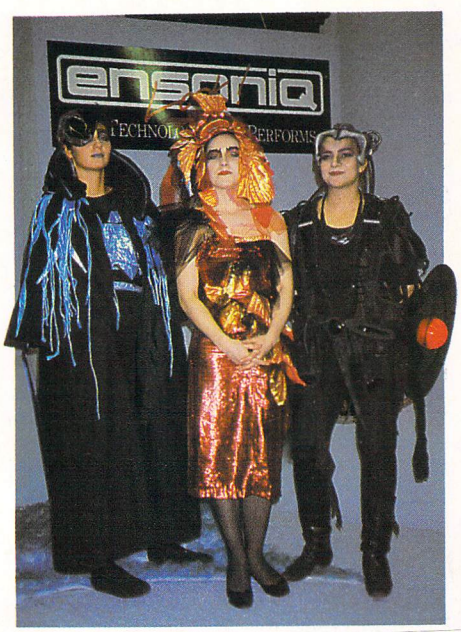
A trumpet version should be available soon and a sax is planned. The price is expected to be around £1,500.

There's barely room to squeeze in a mention of some Midi mixing systems which use the Atari ST as controller. Here's three: With Jellinghaus' C-Mix system the hardware is installed direct into a mixing desk. The Autogate function opens the channels just before a signal actually arrives thus preserving fast attack transients. Systems start from 3700Dm.

Soundcraft's Twister PAC (Programmable Automation Computer) mixing systems range from £995 for an eight-channel mixer up to £5,700 for 32 channels.

J.L. Cooper's MixMate is an eight-track, Midi automation mixing system which will lock to SMPTE or Midi sync with Song Position Pointer. MixMate Plus and an Atari ST will provide a graphic display, expanded memory and disc storage.

Finally, at the Fair on the Hybrid Arts stand I bumped into Ashley Ingram – a carefully contrived coincidence – songwriter and keyboard player with Imagination. He uses an ST with Hybrid Arts software.



A glimpse of the future on Ensoniq's stand

FACT FILE

Hybrid Arts and Soundbits are distributed by Syndromic Music, 24-26 Avenue Mews, London, N10 3NP.
Tel: 01-883 1335.

Cheetah Marketing Ltd., Norbury House, Norbury Road, Fairwater, Cardiff, CF5 3AS.
Tel: 0222 555525.

Philip Rees, Unit A, Park End Works, Croughton, Brackley, Northants, NN13 5LX.
Tel: 0869 810830.

Softwind Instruments, Munstergasse 52, CH-3011 Bern, Switzerland.
Tel: (0)31/22 28 20.

Jellinghaus Musik Systeme, Martener Hellweg 40, D 4600 Dortmund 70, Germany.
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Enter the database

Mark Smiddy takes a close look at the new standard-setting Superbase Professional

WHEN it comes to the ST, software manufacturers have been quick to seize on the machine's potential as a games computer, but relatively slow on the uptake when it comes to good quality business software.

In particular, the ST has lagged well behind other personal computers with the availability of an easy-to-use, yet powerful database management system. Packages such as K-Data, Trimbase, and DBman come close, but each seems to fall over in one or more crucial areas – reporting, relational capability and so on.

Last year Precision released Superbase Personal – a package meant to put all others to shame. Generally speaking this is exactly what it achieved, breaking new ground with a control panel similar to a video cassette player making record searching a real breeze.

For most applications this was enough, but what it lacked was decent reporting ability and, once again, true relational facilities. In other words, the sort of features that turn a useful utility into a power tool.

Blazing a trail

Bridging this gap, and blazing a new trail for all to follow – enter Superbase Personal's big brother – Superbase Professional. A complete package boasting true relational characteristics in the form of the database management language DML and an extremely flexible forms editor capable of producing tailor-made forms from invoices to advice notes.

As anyone who's ever set up a database will tell you, the hardest part is designing the entry form and the most time-consuming part of the job is entering and updating records.

All databases – and Superbase is no exception – rely on fields, like a set of pigeon-holes containing information. In fact at their simplest level, these fields are like the entry sections on cards in a card index system.

However, in Superbase a field may hold one of many different kinds of information, not just text. Times, dates, and even calculations are possible.

Before any data can be entered the user must first open a new database file. This is done by selecting New file from the project menu and typing in the name of the data file, say Address. Clicking OK results in Superbase requesting a password for the file.

The system operates on up to three levels, requiring three passwords. Each level offers different privileges from read only to complete control. Incidentally, the use of passwords isn't mandatory, although it is recommended for use in an office to prevent a secretary accidentally wiping an entire database.

When the file definition is being created Superbase opens a Gem-like dialogue requesting the field name and type. The default field is text, 20 characters wide, although clicking on the text button brings up another dialogue giving a list of possible options, most obvious being the field width, altered by clicking on one of the symbols sandwiching it.

The next three buttons alter the way in which Superbase handles text entry for that field. The upper and lower case options convert the whole string to the required case, no matter how it was entered.

The capitalise option only converts the first item in the field to upper case. It does seem a pity that this couldn't capitalise just the first letter of each word in the selected field. Each text field can consist of up to nine responses.

Preference selections for the formats of numeric, date and time information are similar to the text dialogue. All fields have a further selection of options accessed from the initial dialogue. While most – like Required – are obvious from their names some, Validated for instance, warrant further investigation.

Clicking the appropriate button brings up a dialogue requesting the user to enter a validation formula for that field. For example, imagine you were offering certain clients a variable amount of trade discount for your products – say between 10 and 25 per cent – then the validation formula for the discount field would read:

```
Discount >=10 AND Discount <=25
```

Superbase would then prevent you entering a value outside that range by mistake – in this case unwillingly giving too little or worse, too much discount.

Calculated fields work in a similar fashion, although now you must enter a formula. Taking the previous example, say another field was called Price – the cost plus profit – then the field containing the actual cost for that client minus discount would read:

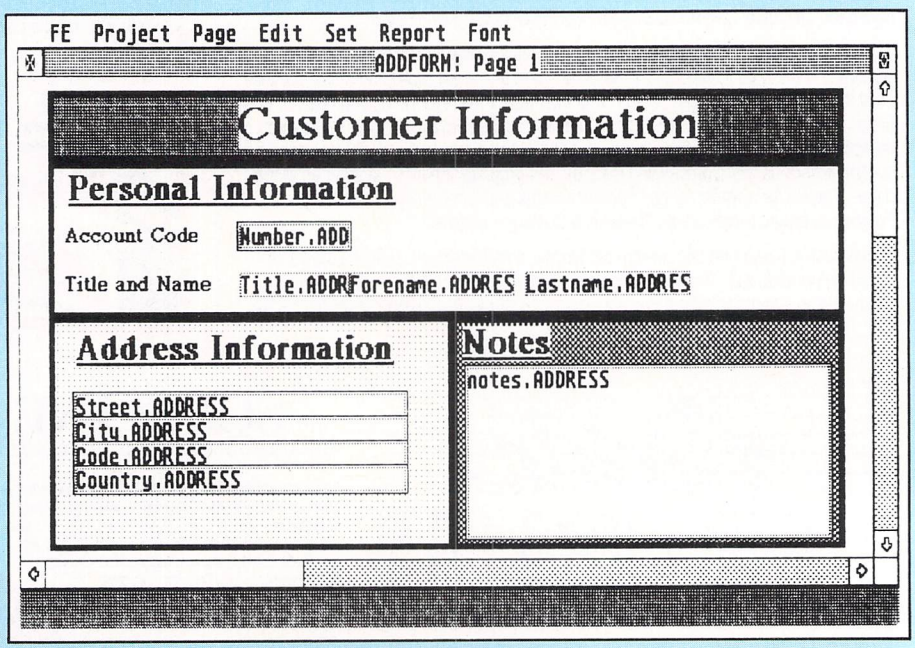
```
Price - (Price * Discount / 100)
```

With any database, once the data has been defined and entered, there has to be some way of getting it back out again in a usable format – to a printer for instance.

By way of illustration, imagine the database contains a list of several thousand client records – names, addresses, telephone numbers, and so on. Now suppose you wanted to find out the names and addresses of those you were offering more than 20 per cent discount to.

Superbase solves this problem with panache. Firstly, the Open Fields option is selected from the Project menu. This allows just the specified fields to be selected, name, address and discount in this case.

Secondly, the search filter is called



Designing a form

from the control panel. This allows the records to be searched using a combination of six relational and three logical operators plus string matching. Brackets may also be included to make the meaning clearer.

The filter for this example is simply:

```
Discount >= 20
```

And to narrow the search still further, display clients that live in the Manchester area:

```
Discount >= 20 AND Town LIKE "Manchester"
```

The LIKE operator used here is special to Superbase. Unlike equals, it isn't case sensitive and in addition, it can even search for part words or use special wildcard functions. The manual lists over a dozen different ways of using it.

Now supposing you can get the relevant information out of the database, but you want to send a letter to your most important clients, announcing some good news. It would be great to address and write each letter personally, but such things take time. The ideal method would be to produce a standard letter and have the computer fill in the blanks. Such a process is called a mailmerge and nestling among the Process menu is just that.

The standard letter is produced in the usual way – using Superbase's built-in text editor – with the blanks containing the field names surrounded by ampersands. It's even possible to include the system date by including &Today& where it is required.

Label printing

To make life even easier, Superbase even includes a powerful label-printing feature so you won't even have to address the envelopes yourself. Like most other features, the label printer requires a filter setup before printing can commence. This is followed by another dialogue controlling the layout of the labels themselves.

Each label can be made up of up to 10 lines of text. However by a simple arangement controlling the number of fields per line, people's names for instance, don't get split up over several lines. The dialogue even includes facilities to test the label setup and print one-offs. The ability to test the output before committing yourself can be a real bonus.

One of the unique features of Superbase is its superb external file management system. This allows the automatic recall of text documents and even pictures corresponding with particular records.

External text files allow the inclusion of memos and long documents, while picture files allow the inclusion of digitised images or drawings from a painting or computer-aided drawing program. To be more precise, Superbase can read Degas compressed and uncompressed, Neochrome or Gem image format pictures, which in fact covers almost all of the popular drawing packages.

The subject of drawing packages brings me neatly to Superbase's forms editor. This is a separate program tailor-made to producing forms for use within database files. Superbase does have an internal forms feature although it is rather basic – the sort of thing I usually expect to find in a database.

By comparison, the forms editor is a gigantic leap ahead. In its own way it is a simple object- oriented drawing program – like a simplistic version of Easy Draw.

Unlike pixel-oriented programs like Degas, the forms editor is concerned with the movement and positioning of objects. A simple analogy is to imagine the form made up of many sheets of paper of different sizes, widths and so on – some are pictures, some text.

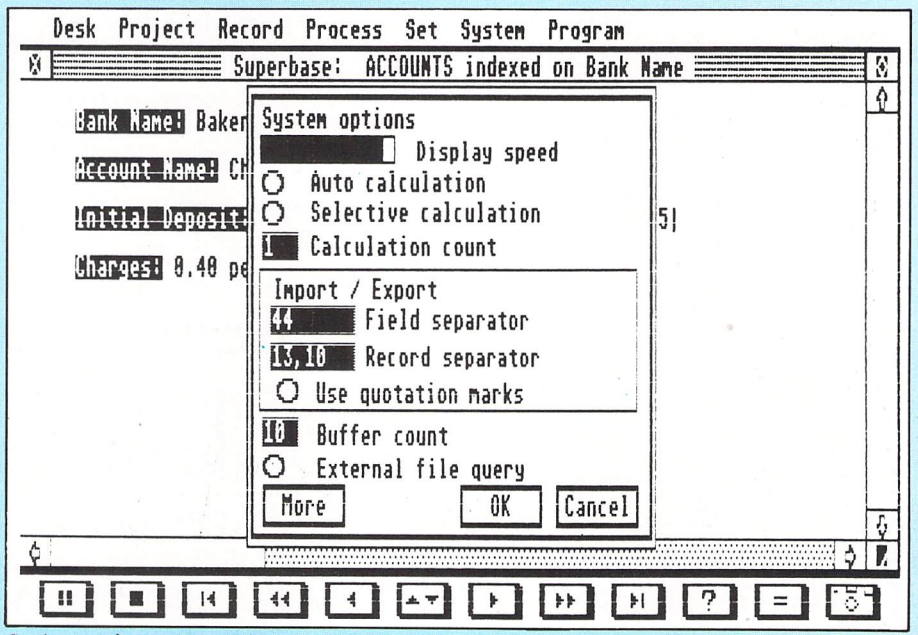
Once you've gathered together all the pieces, you may then proceed to lay them out, with some sheets overlapping others if necessary. This layout can then be juggled around ad-infinitum until you're happy with it.

The complete form can consist of up to nine sheets on a three by three matrix. Each form is approximately equal to one third of an A4 sheet in height and 80 columns wide. Text can be in a variety of different sizes and styles. It's even possible to produce a coloured form if you're using a colour monitor.

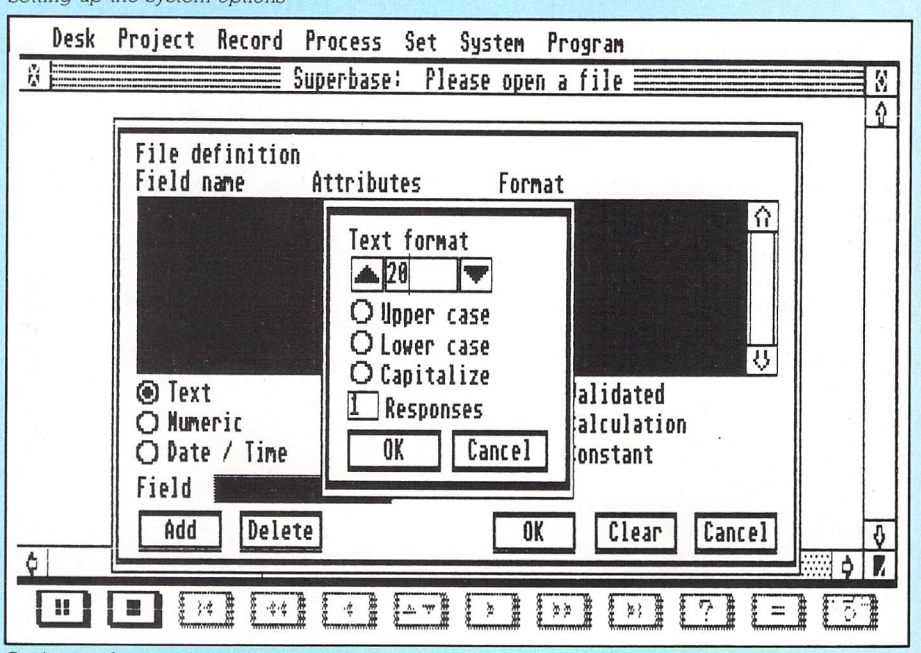
Although the editor is nothing like as concise in operation as Easy Draw, it is, like the rest of the package well designed and very easy to use. With practice, it is possible to produce some quite superb looking designs. To prove it, several examples are supplied with the package to help get you started.

Once a form has been created it may

Turn to Page 22 ▶



Setting up the system options



Setting up format of a test field

◀ *From Page 21*

be loaded into the main database program and used to format the output. In fact information can be plucked from more than one database file simultaneously, including records or pictures using the external file management system.

Finally, perhaps the most significant part of Superbase Professional is its programming language DML. Don't be put off by the fact that DML is tailor-made for use with Superbase – it is in fact not unlike a well thought out Basic.

DML includes commands for all but three of Superbase's menu and control panel functions – that's over 200. At the simplest level, a DML program can be used to execute a sequence of commands just as if they were selected from the drop-down menus.

At the highest level it is even possible to define your own menus – tailored for your own application. And its considerably easier than attempting the same sort of thing in an equivalent high-level language, like C for instance.

However, in my opinion one glaring omission in DML is the lack of the conditional CASE...ENDCASE construct. It is easy to avoid needing this, but in an otherwise well structured language, I was surprised not to find it implemented.

Overall Superbase responded well to all trials. However, there are a couple of areas in which it falls over badly – mainly that of disc directory processing. The system used is an unstable hybrid of the Gem file selector and MSDos. The result is, more often than not, utter confusion.

To change the default drive to drive B, requires you to open the Directory Change dialogue and enter B:». The file selector is not refreshed by this action and you have to select another option to get a directory of the disc. Hardly satisfactory.

One other point worth a brief mention is the program editor, which is quite horrendous. Some remarkably illogical key operations have been chosen, almost at random it seems. For instance, Clr/Home moves the cursor to the beginning of a line Insert moves it to the end and Control+V toggles the insert mode. Fortunately, the same can't be said of the built-in text editor which, by comparison is quite excellent.

Serious users would be well advised to invest in a hard disc, as Superbase stores its records using the virtual memory system. This means the number of records that can be stored is limited by the amount of disc space available. In a commercial application it's surprising just how quickly you can fill a double-sided floppy.

Superbase is supplied as four discs with two hefty manuals. The documentation is verbose, but never overly so, and is literally oozing with pertinent examples and tutorials aimed at getting you going as fast as possible.

Superbase is far and away the best database system I have come across on the ST.

Apart from a few minor niggles, which I sincerely hope will be put right in later versions, the package should fulfil the needs of anyone who needs a sophisticated database.

FACT FILE

Product: Superbase Professional
Price: £249.95
Supplier: Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ
Tel: 01-330 7166

POINTS FOR:
Easy to use. Very flexible. Can handle calculations and graphics.

AGAINST:
Expensive. Disc directory handling could be better. Poor program editor.

COMPETITORS REVIEWED:
K-data, December 1987.
Base 2, December 1987.
Superbase, July 1987.
Trimbase, July 1987.

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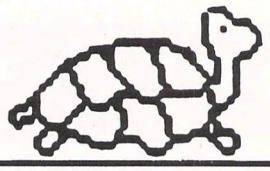

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Lisping into the real world

Nice program, but it's a shame about the sparse documentation, says Stephen Hill as he reviews a new version of the language used in artificial intelligence programming – Lisp

THE Lisp programming language originally started life as an experimental development tool used by computer scientists engaged in artificial intelligence research. It was utilised to create many of the landmarks in the AI field, from the well known Eliza project to the first chess programs.

Unfortunately, Lisp is notoriously memory hungry and processor intensive. This meant the early systems needed phenomenal amounts of memory in order to work, which effectively restricted their use on anything other than a large mainframe computer.

Nowadays with micros such as the Mega ST ever more commonplace, Lisp has finally left the laboratory and entered the real world.

In many respects the ST is ideally suited to Lisp programming, because it combines a large memory with a fast and powerful processor. So it's nice to see a new Lisp system from Talent which could well bring this fascinating language within the reach of most ST users.

The Lispas 2 package comes on one single-sided disc containing a Lisp interpreter and some example programs. It supports a straightforward and easy-to-use Gem-based programming environment capable of working in either high or medium resolution.

After the package has loaded, you are left with around 20,000 Lisp cells available on a standard 520ST. Each occupies 12 bytes of storage, and can hold either data or part of a function definition.

Lispas uses a standard screen editor, very similar to those found in many versions of Basic. Like all such editors, you can only edit the text which is currently on the screen. This limits the size of the Lisp functions you can manipulate to a maximum of 15 lines.

If you do need to edit larger routines you can readily use any other editor you like, as all Lisp programs are stored on the disc in standard Ascii form.

On startup you are presented with a left arrow prompt, which is an invitation to type in a Lisp command, afterwards executed by pressing the F1 function key.

Editing an existing program couldn't be easier. All you have to do is type in the name of your Lisp function as a direct instruction. It will then be printed out neatly on the ST's screen, and you can change it to your heart's content. After you have finished you can re-enter the new definition of this function back into the Lisp vocabulary using F1.

The acronym Lisp is often jokingly referred to as Lots of Irritating Spurious Parentheses. In practice all these brackets can become very confusing indeed, especially at the end of a Lisp function, where you need to successively match every single open bracket you have used in the routine with its respective close bracket.

Fortunately, Lispas saves you a great deal of trouble by allowing you to use a single], which will automatically insert the correct number of closing brackets into your program.

Talent also includes a separate editor in one of the demonstration files. It is written entirely in Lisp, and provides you with a number of useful features not available from the basic system.

These enable you to edit several programs simultaneously using windows, and effortlessly rearrange lists of data. In addition, since the editor is supplied in source form it can be readily modified to suit your own individual requirements.

Another potentially worthwhile feature is a small Lisp-based interactive Help program, which is loaded automatically from the editor whenever you need it.

Although this might have been very helpful, the version supplied was useless, simply because it has yet to be translated from the original German. Hopefully this mistake will have been corrected well before Lispas 2 gets into the shops.

It's interesting to note that Lispas 2 was completely written in an early version of OSS's Personal Pascal (also reviewed in this issue). One unfortunate side effect of this is that the Lisp interpreter tends to run fairly slowly.

To my mind this is more of a reflection of the exceptional complexity of the Lisp programming language than any inherent flaw in Pascal. If anything, it is a tribute to the power of OSS's compiler that it was possible to implement this type of program at all.

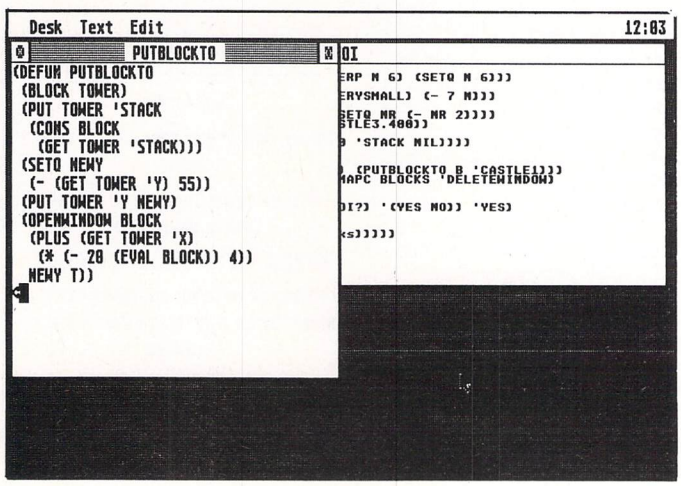
The only way Talent could have realistically solved this problem would have been to rewrite the interpreter from scratch using optimised assembly language, and this would inevitably have increased the price of the package beyond the reach of many people.

Despite having been in existence for more than 20 years, Lisp has yet to establish any consistent set of international standards. This is a real obstacle for anyone who wishes to learn it, as you can't simply pick up a book and execute all of the example programs directly.

Talent has however, made a spirited attempt to sidestep this problem by making this interpreter as flexible as possible. The intention has been to ensure compatibility with other versions of Lisp by enabling you to rename any of the standard functions.

Compatibility is further enhanced by extensive support for the vast majority of standard Lisp constructs. The only real exception is the PROG function, which has been replaced with an expanded version of the DEFUN statement.

If you do require this function, it should prove relatively simple to incorporate a PROG instruction into the Lispas interpreter. A useful set of listings for this, and many other extensions to the language, can be found in Steve Oakey's excellent



Editing a Lisp program

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◀ *From Page 25*

Lisp for Micros (published by Butterworth), which I can heartily recommend.

As Lisp is a fairly convoluted language, it is essential to have some sort of debugging facility. Lispas 2 provides you with a special trace command which readily allows you to examine the action of any function in detail.

Traditionally Lisp is a text-only language, but Talent has also included a small, but useful subset of Gem. You could use this to incorporate simple windowing and pull down menus into your own programs.

If you are interested in the more general type of graphical operations, you will probably be dismayed to learn that Lispas 2 contains no support whatsoever for such activities. Even simple tasks like plotting a line or drawing a circle are therefore impossible to achieve using this software.

The documentation supplied with the package is a major disappointment, especially in a product destined to be used by beginners. It largely consists of a 22 page glossary of the various Lisp functions supported by the interpreter.

As far as it goes this is pretty useful, but the place where the manual really falls down is when it attempts to describe the example programs provided on the disc.

Several of the most significant parts of the package, including both the external Lisp editor and the Help program, are not mentioned at all, and this would almost certainly throw many users into a state of confusion. At the very least, Talent could have placed an explanation of some sort in one of the many READ.ME files on the disc.

Furthermore, the manual also fails to cover a number of other pieces of vital information essential to anyone who wishes to make serious use of the package. It makes no mention for instance, of the interpreter's inability to cope with floating point operations.

Since Lisp uses the point character to denote dotted pairs, anyone who tried to use real numbers as part of a list would be inexplicably presented with a complex and incomprehensible error message.

Overall, this package represents a very inexpensive way of learning about Lisp. It is currently marred slightly by the documentation, but this is largely compensated for by the fact that once you get into it the package is extremely easy to use.

Lispas 2 has no real pretentions as a development system, and there is no facility to allow you to create Lisp programs capable of running independently of the interpreter.

If you're already familiar with Lisp, you would therefore almost certainly be far better off saving up for something more powerful, such as Metacomco's Cambridge Lisp system.

But providing you arm yourself with a good book on the subject, this product would be more than adequate for teaching purposes, and at £29, is undoubtedly excellent value for money.

FACT FILE

Product: Lispas 2
Price £29
Supplier: Talent, Curran Building, 101 St. James Road, Glasgow G4 ONS.
Tel: 041-552 2128

POINTS FOR:
Easy to use. Flexible interpreter. Very cheap.

AGAINST:
Very poor documentation – not suitable for novices.

COMPETITOR REVIEWED:
Metacomco Lisp – July 1987

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Take a break and try Robert Davidson's short, but addictive variation of a classic old arcade challenge

DEMOLITION is a variation of the breakout genre of games currently enjoying an upsurge of popularity on the ST. In this version you drop bombs on to a wall from the top of the screen. However, there is a catch: The wall slowly advances up the screen, and when it overruns your bombs the game is over.

You have an unlimited supply of bombs and when the game is started the first is seen bouncing to and fro across the top of the screen. Tapping the spacebar releases it. At first only single bricks are knocked out of the wall. However, once a hole has opened up more damage can be done.

If you hit the brick at the bottom of a hole then the bricks on the sides above it are also knocked out in a cascade. This is where timing the release of the bomb is crucial for optimum results.

After several bombs have been dropped the wall advances by one space. A new wall will start to appear as the previous one nears the top of the screen.

Although you have plenty of bombs between each advance of the wall in the early stages of the game, the average number slowly decreases with subsequent new walls, thus making it more and more difficult to control the inexorable progress of the wall up the screen.

When a brick reaches the same level as the bombs the game is over. Press the spacebar to play again or Escape to quit the game. The high score is recorded at the end of every game so there is always a compulsion to have just one more go to try to improve on the best result.

The program is written in Fast Basic, so don't enter the line numbers, and is a good example of how its speed can be used to create arcade-type action using simple text graphics. In fact the game runs so fast that delay loops had to be introduced to keep the speed reasonable.

Flicker in the graphics is reduced by making use of the WAIT command just before printing the bombs. This forces the micro to wait for the next vertical sync pulse before printing, and so ensures the character is printed with minimum interference.

Finding the character at each screen position by directly examining screen memory is difficult, so an alternative strategy is used.

The array *A%()* holds a representation of the screen where a zero represents a space and one indicates a brick. As the wall is scrolled up the screen and bricks are knocked out, the array is updated accordingly.

Have a smashing time!

```
  10 REM DEMOLITION
  20 REM By Robert Davidson
  30 REM (c) Atari ST User
  40 REM Fast Basic
  50 REM Don't enter line numbers!
  60 IF SCREENMODE>0 THEN PRINT"Low r
es only":END
  70 PROCinitialise
  80 REPEAT
  90 PROCset_up
 100 count=0
 110 REPEAT
 120 row=1
 130 WHILE row<8 AND NOT dead
 140 bombs=max% DIV2+RND(4)-1
 150 IF bombs<3 THEN bombs=3
 160 FOR go=1 TO bombs
 170 T%=TIME:REPEAT:UNTIL TIME>=T%+10
0
 180 start=RND(2)
 190 dropped=FALSE
 200 WHILE INKEY$<>""
 210 WEND
 220 INK 9
 230 REPEAT
 240 IF start=1 THEN PROCleft ELSE PR
OCright
 250 UNTIL dropped=TRUE
 260 PROCdrop
 270 NEXT
 280 WAIT
 290 TXTSCROLL 0,-8
 300 INK wall_colour
 310 IF count MOD2=1 THEN PRINT TAB(0
,23)row$;
 320 INK 1:PRINT TAB(4,0)"High Score
";hiscore%
 330 INK 7:PRINT TAB(26,0)"Score ";sc
ore%
 340 FOR y=1 TO 22
 350 FOR x=2 TO 37
 360 A%(x,y)=A%(x,y+1)
 370 NEXT
 380 NEXT
 390 FOR x=2 TO 37
 400 IF count MOD2=1 THEN A%(x,23)=1
ELSE A%(x,23)=0
 410 NEXT
 420 FOR x=2 TO 37
 430 IF A%(x,1)=1 THEN
 440 dead=TRUE
 450 x2=x
 460 x=37
 470 ENDIF
 480 NEXT
 490 row=row+1
 500 WEND
 510 count=count+1
 520 IF count MOD2=1 THEN
 530 max%=max%-1
 540 old_colour=wall_colour
 550 REPEAT
 560 wall_colour=RND(10)+1
 570 UNTIL wall_colour<>old_colour
 580 ENDIF
 590 UNTIL dead
 600 INK 5
 610 FOR x=0 TO x2-1
 620 PRINT TAB(x,1)">";
 630 NEXT
 640 PROCdelay(500)
 650 IF score%>hiscore% THEN hiscore%
=score%
 660 INK 9
 670 PRINT TAB(5,24)"Press Spacebar t
o play again";
 680 WHILE INKEY$<>""
 690 WEND
 700 g=GET
 710 UNTIL FALSE
 720 END
 730 DEF PROCinitialise
 740 DIM A%(39,24)
 750 FOR i=0 TO 11
 760 READ R%,G%,B%
 770 PALETTE i,R%*1000/7,G%*1000/7,B%
*1000/7
 780 NEXT
 790 TXTRECT 0,0,320,200
 800 hiscore%=0
 810 brick$=CHR$174+CHR$175
 820 row$="  "+STRING$(18,brick$)
 830 rand=RND(-TIME)
```

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```
  840 HIDEMOUSE
  850 TXTSIZE 6
  860 ENDPROC
  870 DEF PROCset_up
  880 score%=0:max%=13:dead=FALSE
  890 CLS
  900 INK 1:PRINT TAB(4,0)"High Score
";hiscore%
  910 INK 7:PRINT TAB(26,0)"Score ";sc
ore%
  920 FOR y=0 TO 16
  930 FOR x=2 TO 37
  940 A%(x,y)=0
  950 NEXT
  960 NEXT
  970 wall_colour=RND(10)+1:INK wall_c
olour
  980 FOR y=17 TO 23
  990 PRINT TAB(0,y)row$;
 1000 FOR x=2 TO 37
 1010 A%(x,y)=1
 1020 NEXT
 1030 NEXT
 1040 ENDPROC
 1050 DEF PROCleft
 1060 FOR x2=37 TO 1 STEP -1:x=x2
 1070 WAIT
 1080 PRINT TAB(x,1)"0 ";
 1090 IF INKEY=32 THEN dropped=TRUE:x2
=1
 1100 NEXT
 1110 BEEP
 1120 start=start+1
 1130 ENDPROC
 1140 DEF PROCright
 1150 FOR x2=2 TO 38:x=x2
 1160 WAIT
 1170 PRINT TAB(x-1,1)" 0";
 1180 IF INKEY=32 THEN dropped=TRUE:x2
=38
 1190 NEXT
 1200 BEEP
 1210 start=start-1
 1220 ENDPROC
 1230 DEF PROCdrop
 1240 FOR y=2 TO 24
 1250 PROCdelay(2)
 1260 PRINT TAB(x,y-1)" ";
 1270 IF A%(x,y)=1 THEN PROChit ELSE P
RINT TAB(x,y)"0";
 1280 NEXT
 1290 PRINT TAB(x,24)" ";
 1300 ENDPROC
 1310 DEF PROChit
 1320 A%(x,y)=0
 1330 PRINT TAB(x,y)" ";
 1340 PROCscore
 1350 xleft=x:xright=x
 1360 yleft=y:yright=y
 1370 hitleft=TRUE:hitright=TRUE
 1380 REPEAT
 1390 PROCdem_left
 1400 PROCdem_right
 1410 UNTIL hitleft=FALSE AND hitright
=FALSE
 1420 y=24
 1430 ENDPROC
 1440 DEF PROCdem_left
 1450 IF hitleft=FALSE THEN ENDPROC
 1460 xleft=xleft-1:yleft=yleft-1
 1470 IF A%(xleft,yleft)=0 THEN hitlef
t=FALSE:ENDPROC
 1480 A%(xleft,yleft)=0
 1490 PRINT TAB(xleft,yleft)" ";
 1500 PROCscore
 1510 ENDPROC
 1520 DEF PROCdem_right
 1530 IF hitright=FALSE THEN ENDPROC
 1540 xright=xright+1:yright=yright-1
 1550 IF A%(xright,yright)=0 THEN hitr
ight=FALSE:ENDPROC
 1560 A%(xright,yright)=0
 1570 PRINT TAB(xright,yright)" ";
 1580 PROCscore
 1590 ENDPROC
 1600 DEF PROCscore
 1610 score%=score%+1
 1620 INK 7:PRINT TAB(32,0);score%
 1630 BEEP
 1640 PROCdelay(20)
 1650 ENDPROC
 1660 DEF PROCdelay(n)
 1670 T%=TIME
 1680 REPEAT
 1690 UNTIL TIME>=T%+n
 1700 ENDPROC
 1710 DATA 0,0,0
 1720 DATA 7,0,0
 1730 DATA 7,3,0
 1740 DATA 7,7,0
 1750 DATA 7,0,4
 1760 DATA 7,0,7
 1770 DATA 3,7,0
 1780 DATA 0,7,0
 1790 DATA 0,7,4
 1800 DATA 0,7,7
 1810 DATA 0,4,7
 1820 DATA 0,0,7
```


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The sky's the limit!

Ian Waugh trains his trusty telescope on the heavens and tracks the moon and stars with a superb new astronomy program – Skyplot

THIS is a program of galactic proportions in every sense of the word. The Universe is vast and won't fit into less than one megabyte of ram and although it can be shown in either monochrome or colour, the latter monitor tends to display circles as ellipses.

The program contains data for the eight planets, the sun, moon, three comets (Halley, Wilson and Kohoutek), 612 stars (for the visible constellations), and 1,053 nebular objects such as clusters and galaxies. There's also data for an additional 15,383 stars – virtually all those up to magnitude 7.0.

This data is stored in three files in Ascii form and takes more than 20 minutes to load. The good news is that the program will save all this data in compressed form, so subsequent loadings will only take about three minutes. Data is held in Ascii form so you can change it and add your own objects – for those of stout heart.

The manual is also vast, a mammoth 95 pages. You'll be able to find your way through most of it without the manual, but it provides lots of additional information. Strangely, there's a Help screen for pirates which gives the basics for operation – no real substitute for the manual, though.

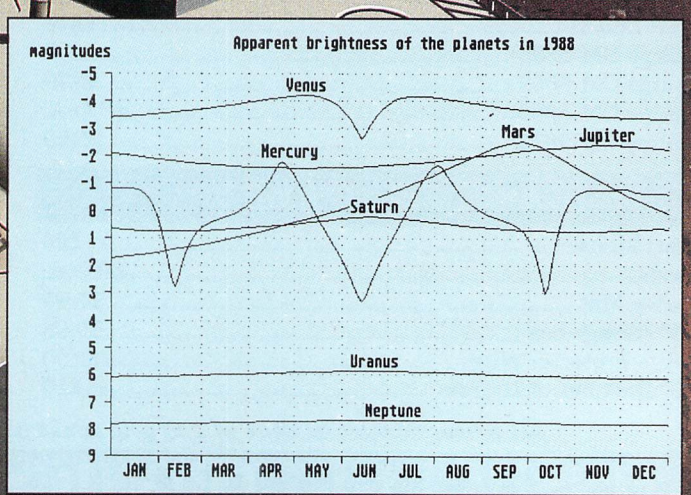
Once the data has loaded you're presented with the Present Setting screen which shows the date, time, location and which heavenly bodies have been selected for display. The Settings menu lets you alter the date and location, and select the range of objects you want to see.

In order to display the sky as it will appear from your position on Earth you need to enter your longitude and latitude. If you don't know these you can select Location in the Search menu.

This draws a globe of the world which you can magnify and turn until your position appears under two crosshairs. You can use this to view an eclipse, for instance, which may only be visible from the Southern hemisphere. Super.

There are five types of display: The complete sky, equatorial map, horizon map, polar map and the visible sky. If you select the last option you can move back and forward in time to see how the bodies change their position.

If you click on an object, a box appears containing its name and some information about it. If you click on a star and it's part of a constellation, a click on the right button will join the stars. Alternatively, if you select a



Plotting the magnitudes (brightness) of the planets

planet or comet, clicking on the right button will reveal a little history or observational information.

You can rubberband a sector to magnify it and the manual claims a magnification factor of about 3.7 trillion. Although you can't see surface details of the planets, you can see the phases of the Moon and the rings of Saturn.

As well as the variety of displays, there are a myriad of other options to choose from. Skyplot will display elliptical and parabolic orbits of objects and you can limit the bodies displayed by setting a minimum magnitude – this will only work with those stars whose magnitude is known.

You can change the mouse cursor to crosshairs, and as you move it around the sky the coordinates will be shown. There's a 3D display, along with instructions on how to contort your eyes to produce the effect, which is interesting, if perhaps not always 100 per cent successful.

You can display the sky as it would be seen from another planet – or in fact, from any point in space – within a range of about 100,000 parsecs from the sun. See what the universe looks like from Alpha Centauri!

There are all sorts of options to locate planets, stars and constellations, and you can search for conjunctions – an astrological term pinched by Russell Grant – of the planets.

You can display our solar system as seen from the side or above and you can produce an animated display of the planets' movements around the sun. You can also bring up a map of the planets' movements through the sky.

The program will calculate the rising and setting times of an object and plot a graphic display of the planets' brilliance and diameters over a year. It will produce a set of stellar statistics showing the number of stars on view, along with their magnitude.

To use these maps in practice you'll want a printout. There's only one print routine and that sends the screen map to a Casio FP-1011PL plotter. However, it's easy enough to dump to a dot matrix printer if you install a printer routine. Thoughtfully, you can invert the screen so the stars appear black on white, which makes the printouts easier to read and preserves your ribbon.

You can save pictures to disc and give them a Degas header. You can also save a sequence of pictures for display in the Planetarium, a separate program also supplied on the disc. This displays a sequence of sky pictures which is both entertaining and educational.

The German programmer Frank Thielen also wrote the manual, and although his English is fair I do wish it had been given to an English reader to edit. There is just no excuse for some of the Germenglish and he doesn't even manage to get the names on the menus correct, which is absolutely unforgivable.

Two more gripes: You have to hold the mouse button down too long to make it register – the response is very poor. Also, the box the program comes in is a squashy thin cardboard affair.

The price of the program is going to limit its potential sales severely, and anyone paying this amount of money deserves good mouse response, a well-written manual and sturdy packaging.

In spite of that, Skyplot is impressive. It began life back in 1980 on a Sharp PC1211 with 1,424 bytes of memory, and, the ST version has been in development for over two years. Since its inception it has undergone over 700 revisions. A labour of love indeed.

I think Skyplot will be welcomed with open arms by serious and amateur astronomers everywhere. It could well be used for educational purposes, and even the interested layman will be able to derive a lot of pleasure and information from it, although, unfortunately, its price will deter the casual observer.

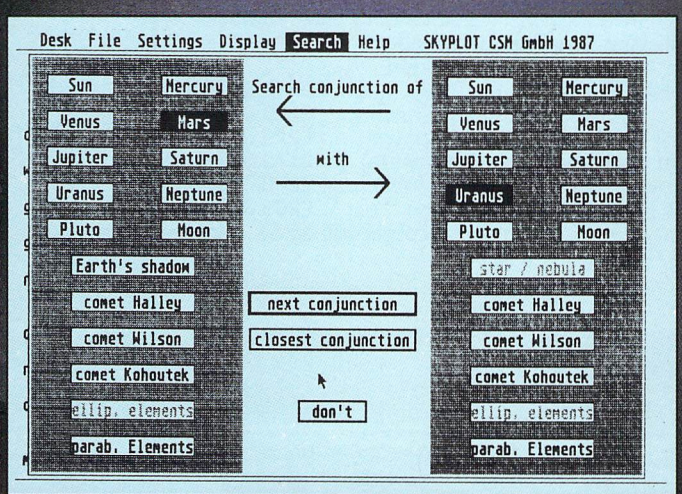
If you watch The Sky at Night, this is for you.

FACT FILE

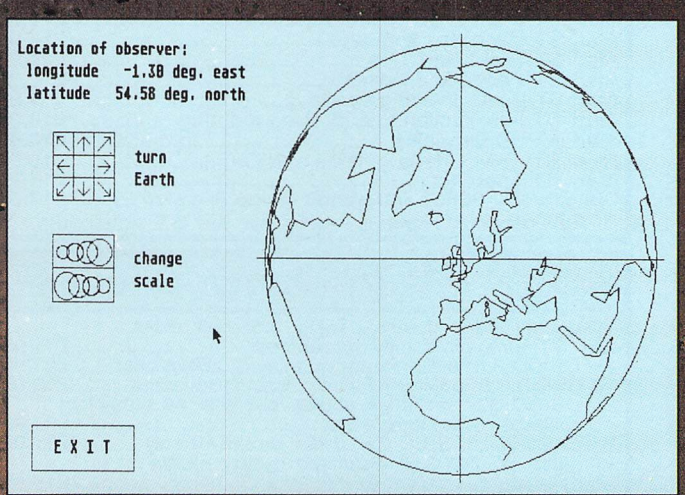
Program: Skyplot
Price: £69.95
Supplier: Robtek, Unit 4 Isleworth Business Complex, St. John's Road, Isleworth, Middlesex TW7 6NL.
Tel: 01-847 4457

POINTS FOR:
Comprehensive program with a vast number of features.

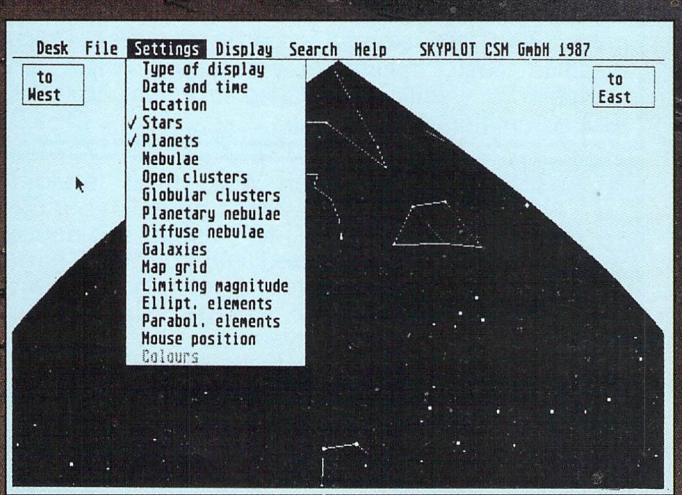
AGAINST:
High price. Poor English in the manual. Needs 1Mb of rom.



The search dialogue box



Setting the longitude and latitude of your position



The options on the settings menu

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Ron Massey tries out an art package which also doubles as a highly effective animator and flexible sprite designer

Artistic impressions

AN observation related to me recently was that the only reason for the range of drawing programs for virtually every micro now available must be the differences between users' working preferences and priorities. With each new program title, it seems as if each is destined to become the industry standard in much the way Gem has.

One of the reasons for this may lie in the fact that subsequent programs tend to encourage new programmers, who in turn, become inspired by the existing range of products and think to themselves: "I can do better than that". And quite often they do.

Whatever the cause though, a new product from MichTron, GFA Artist, only proves that lightning does strike in the same place more than once.

It is supplied on two discs (system and data), and includes a particularly well-written manual. In addition to the main drawing program, you also receive program-related application modules.

The software is compatible with standard ST picture formats such as Degas, Degas Elite, NeoChrome, Art Director and Colourstar and automatically converts one picture format to another.

Pictures produced by other drawing programs can be loaded into Artist for inclusion in a film sequence. It will also save pictures in other screen formats.

After loading Artist from the system disc, the screen prompts for a keypress to start the program. If you wish to see the demonstration film, exchange the system disc with the data disc before pressing a key.

Artist's features are accessed through either of two menus (referred to in the manual as boxes). Defaulting to the F2 box on startup, you are offered screen control, files, drawing and sprite production tools. The F1 box is used to organise sprites and backgrounds into a defined sequence.

As supplied in the UK, Artist operates in medium resolution only and defaults to 60Hz, although you can alter the latter with the configuration system accessed with the INF icon in the F2 box.

Drawing options

Artist supports up to four screens – two are known as source and two as destination. Whole or parts of screens may be transferred from one to the other. Parts of one screen may be used to produce sprites and placed on the second screen exclusively.

Access to the drawing and sprite functions is available from the 60-icon F2 box. The inverse cursor in the box is moved by holding down the left mouse button and moving the mouse as required.

Selection is made by pressing the right mouse button. Some of the options, such as Neo colour cycling and 1,000 colours mode, both of which are mutually exclusive, toggle off/on with the right button.

With the exception of inputting characters, interaction with the keyboard has been kept to a minimum. F1 switches to the animation box, F2 switches to the main menu box, Delete toggles the box white on black and vice versa, Escape toggles the menu off and on, Help accesses the nested menu associated with the current icon and Undo toggles the last drawing operation off and on.

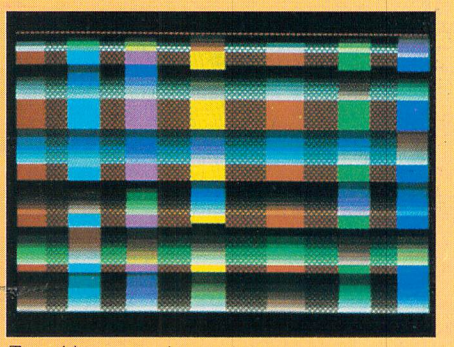
Rubberbanded lines offers you three sets of additional options: You can select which type of line endings you wish to use. The start of line and its terminator may be selected independently and you have a choice of square, radiused or arrowed.

All of the options utilising Artist's flood fill routine, including spray, allow you to select from 34 patterns, design a custom single or multi-coloured fill pattern and select a new fill colour from the current palette. Custom palettes can be saved as separate files.

For most of the drawing tools, you can change colours from the current palette by pressing Help with the relevant icon highlighted.

One of GFA Artist's star features is its facility for allowing you to have 1,000 colours on screen. After switching the 1000 icon to on, select the next icon to the right. Pressing the right mouse button, you are offered a colour palette. Select the colour you wish to be associated with a transition zone – take a look at Figure I to see these zones.

Pressing the right button again, you are

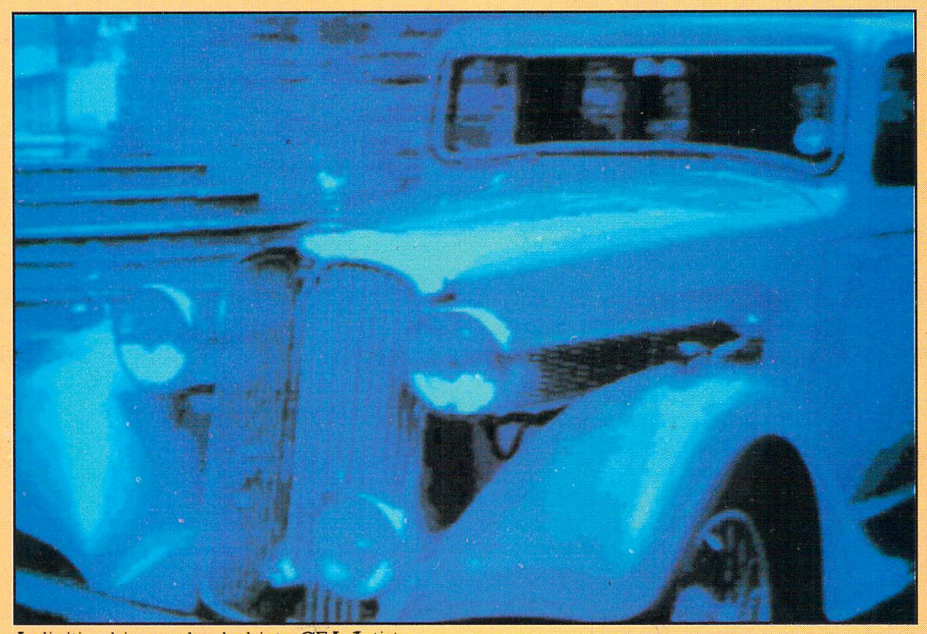


Transition zones in the 1000 colour mode

offered another palette with a set of RGB sliders and two switches for selecting the start and end colours to be used in the transition zone whenever the defined colour crosses it.

Several zones, positioned horizontally, may be superimposed so as to modify associated colours. The picture above shows the effect of drawing over several individually defined zones. The screen was first filled with a red stipple pattern.

The shaded horizontal bands are the transition zones and the vertical bands are the colours to which the zones are



A digitised image loaded into GFA Artist

associated. In this illustration there are six overlayed zones associated with six vertical colours.

In addition to the usual range of drawing tools, Artist includes a number of aids for special effects such as user-defined areas for rotation, localised enlargement, reduction and re-colouring.

Other special effects include functions orientated horizontally or vertically such as translating a defined area into a 3D effect, a drum or a parallelogram.

GFA Artist has one of the most useful magnification facilities I've yet come across. Available in either four or eight times magnification, the upper 20 per cent of the screen displays the image as a band of the 1:1 image.

This is overlayed with a rectangle indicating the area displayed in the magnified image in a separate window below it. Moving the mouse sideways moves the cursor-window, while vertical mouse movement scrolls the 1:1 image, which is echoed in the magnified part of the drawing.

Pressing the left mouse button fixes the position of the magnified image and displays the current magnification value plus colour palette. You can select a colour from the palette and draw in the same way as a 1:1 full screen image.

Most of the functions available for drawing static images have their counterparts for use in making sprite sequences. For instance, if you select the animated drum, you first specify the number of sprites you wish to use in a sequence.

You then select the part of your current drawing to be included in the sprite. The drum can be set so it zooms in and out, rotates or changes size. Once the parameters for the sprite are set up, the sequence is drawn and animated.

Functions available from the F1 box provide you with specialised editing facilities to enable you to assemble your

Distorting a defined block

drawing cells into an animated film.

The animation editor is made up of seven divisions:

- Sequence – Define, copy, swap, kill, move and show.
- Background – Define, info, and screen one or two.
- Group – Define, edit, create, move, copy and new.
- Sprite – Define, new and extra.
- Frames – New, edit and extra.
- Film – show, speed and new.
- Files – load, save and extra.

Two font files, Gothic and Roman, are supplied with the GFA kit. While these are adequate for the majority of requirements, it is probable that occasions will

Turn to Page 37 ▶

Why let your word processor slow you down?

PROTEXT is the fastest on the Atari ST

Unlike its competitors, Protext does not use Gem. The scrolling speed is four times faster than that of Gem based word processors. Yet Protext is still WYSIWYG and still allows access to desktop accessories.

Protext is faster all round, for example the search and replace command is six times faster than First Word +, and the spelling checker, too, is faster.

Protext has all the features you would expect from a good word processor - many text editing commands, print commands, spelling checker and mailmerge. What you might not expect though, is the refinement and thought that has been put into the program - the logical keystrokes and commands, the clear layout, the speed and power ... all go towards making Protext ideal for the novice or the experienced user alike.

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"To sum up, Protext is probably the most powerful word processor on the Atari ST and is quite likely to become the best selling too"...

..."Every feature you could possibly want is here - word processing, Ascii text editing, mail merging and so on"
ATARI ST USER April 1988

Box manipulation	move, copy, or delete any box as well as blocks
Command recall	commands are stored and can be recalled and edited with cursor keys
Configuration	configure most features to your own preferences of line. delete line, block or box
Dictionaries	add/delete words to/from supplied dictionary. Create additional specialised dictionaries.
Disc utilities	copy files, erase, rename, type, create directory, change directory, remove directory, catalogue files
Exec files	store sequences of commands in files for easy use
File conversion	flexible file conversion utility for other WP files
Find & replace	very powerful and fast with many options. All or part of text, forwards/backwards, whole word or part, wildcards, case specific or not, nth occurrence, find control codes, single key for next find/reverse direction
Foreign languages	accented characters can easily be used ä æ ç ö ü è é ß à ù ô ê ñ etc. German dictionary available separately
Formatting	format paragraph, block or whole text, centre line, word wrap on/off, right justify on/off
Headers & footers	up to 9 lines of text, different even/odd headers and footers possible, automatic page numbering
Help	edit and command help available on-screen
Hyphens	soft hyphens and non-break hyphens
Keyboard macros	string any sequence of letters together on a single key e.g. "Yours sincerely"
Line spacing	variable in half lines, including 0, ½, 1, 1½, 2, 2½, 3
Margins	all margin sizes variable, different even and odd
Markers	block markers, 10 place markers, multiple markers
Preview	print to screen to check layout
Printer support	works with any parallel or serial printer. Wide range of printer drivers supplied, incl. lasers and 24-pin printers. Drivers may be edited, or new ones created
Printing styles	bold, condensed, double strike, elite, italics, enlarged, pica, NLQ, subscript, superscript, microspacing, proportional spacing, any other printer fonts
Program mode	program editing mode suppresses formatting
Proportional text	will print proportionally spaced, right justified text
Quick dictionary	dictionary held in memory is very fast
Ruler lines	any number of ruler lines to define document layout. unlimited line width. define left/right margins and any number of normal/decimal tab stops
Spelling checker	check from disc or current text. Suggests alternative spellings. Works with foreign languages
Time and date	set time and date, use within document
Tutorial files	help you to start using Protext
Two file editing	two documents in memory, copy text between them
Typewriter mode	direct printing for envelopes etc.
Undelete	retrieve text deleted in error
Word count	quick count at any time, whole text or just a block
Word puzzles	anagram and crossword solving features
Wysiwyg	on-screen bold, underline, italics, sub/superscript

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◀ *From Page 35*

arise when special characters are needed.

GFA has included an easy-to-use font editor which can be used for modifying the fonts supplied and saving the altered font file under a new name. Alternatively, you can design new fonts from scratch.

Unless you are conversant with the structure of the character set layout, I recommend modifying the existing fonts initially. In order to make the job quicker and less nerve-stretching, try to group your characters on their similarities. Lower case b and d, for example, are often flipped horizontally. Likewise, c and e share similar character outlines.

The font editor can define up to 160 characters (Ascii codes zero through 159) and editing is done in a 16 x 16 matrix. Functions are provided for making global alterations to the current character and include displacing it within the grid, horizontal or vertical inversing, clearing the grid and file handling options.

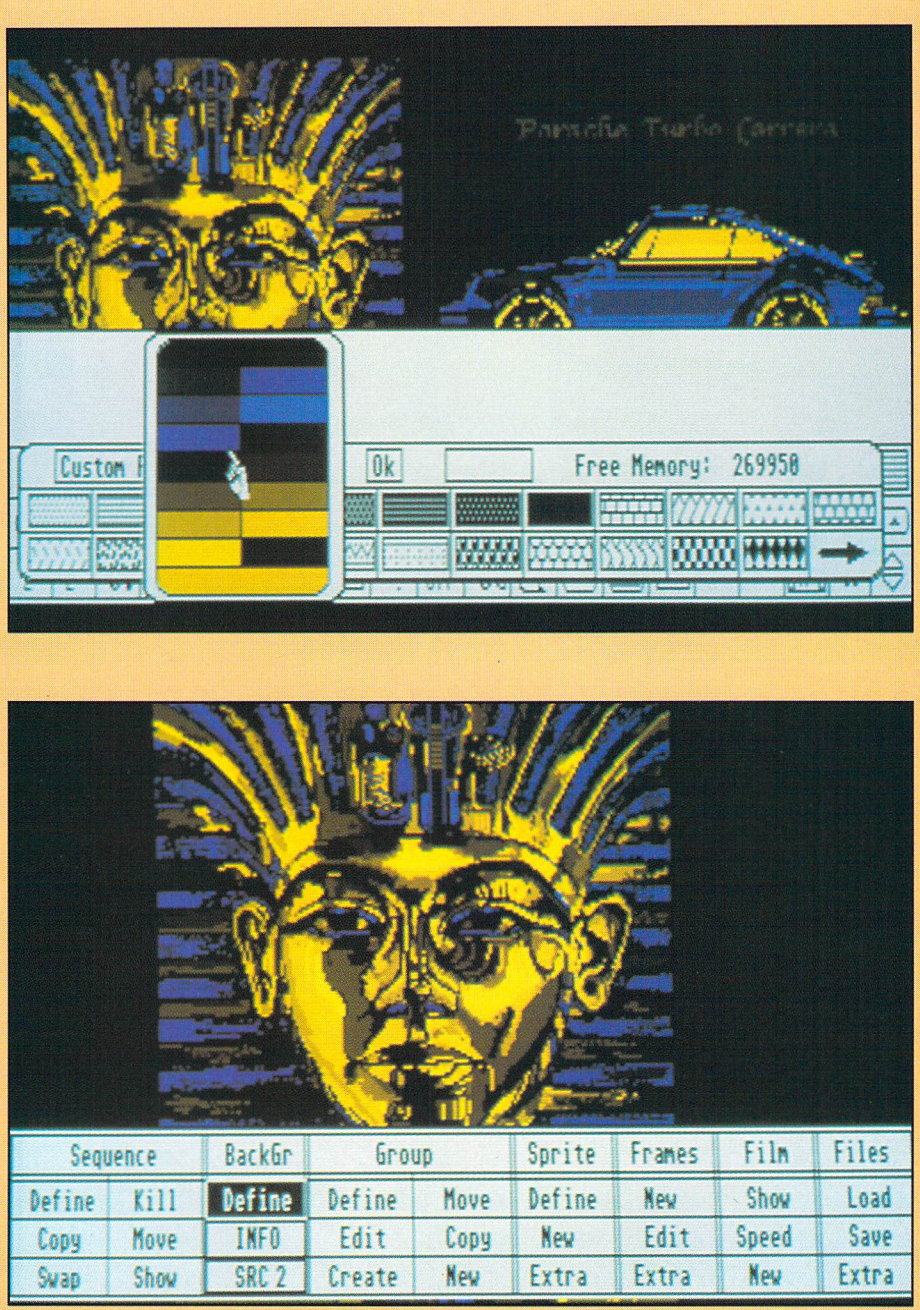
The GFA run-only interpreter has been provided as a utility, allowing you to free a considerable amount of memory otherwise occupied by Artist. Also, it is free of copyright restrictions, so you can distribute your films to friends who may not have a copy of Artist.

Film size is limited to the amount of memory available and, to some extent, is also influenced by the size of the sprite file. In practical terms and depending upon a number of other factors, films up to about 2,000 frames can be held in memory with 1Mb of ram.

The demo film supplied with Artist is made up from 1,500 frames, 75 sprites and a 32k background. At the default speed, the film takes about 3 minutes 40 seconds from start to finish, making its flip-through rate about 6.5 frames per second.

By using GFA's run-only interpreter, it is possible to have a maximum of 20,000 frames. At the default speed, this amounts to a film with about 51 minutes showing time.

For applications where several films share a sprite file in common with a run only interpreter file, it is possible to use GFA's film merger utility, enabling you to join several together.



The main menu

Conclusions

Working with GFA Artist is a little like going on a treasure hunt. Its nested menu system is comprehensive, and following the growing trend of a number of other art programs, replaces the standard Gem menu bars.

Infrequently, I come across a program that leaves me with the feeling of "WOW!". Artist is one of these. The few areas which I felt could be improved have more to do with my own working preferences than any real shortcomings of the program. I felt that some of the options, such as paint, would have been improved had the position of the brush been highlighted.

Also, an option of having coordinates and/or dimensions would improve the ease of precise positioning. While viewing animation sequences, having an optional frame/sprite counter would also be useful.

GFA Artist is easy to use and, with only a very little practice, you can produce pictures and animated sequences of a very high standard.

In addition to being a top-grade drawing program, it is an animator's dream. What is really is astonishing is that with the exception of a few machine code additions for improvement in speed, GFA Artist was written in GFA Basic.

FACT FILE

Product: GFA Artist
Price: £49.95
Supplier: Microdeal, 41 Truro Road, St. Austell, Cornwall PL25 5JF.
Tel: 0726 68020

POINTS FOR:
Produces animated film sequences. Built-in sprite functions.

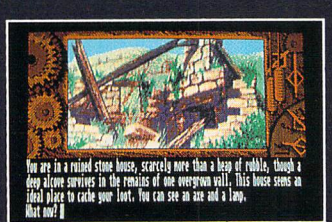
AGAINST:
Paint option could be better. Coodinates would improve positioning.

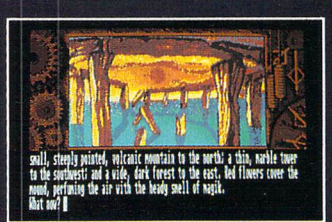
COMPETITORS REVIEWED:
Cyber Paint – April 1988.

Time and magik

The trilogy

Interactive fiction from Level 9





Screen shots from Atari ST version

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Cut-price ANIMATING

Struggling trying to animate characters in Basic? A B Animator could be the answer to all your problems, says Roland Waddilove

MANY programmers writing games or other applications involving animated graphic sequences using Basic would like to include sprites. In fact, they're essential to a good arcade game.

However, they are very difficult to implement, as the built-in commands – if there are any – are often very rudimentary. On top of this, there is the problem of designing the sprite frame in the first place – you need some sort of editor that produces the character data in the right format.

A B Animator, another budget release from A B Software, is aimed at the Basic games writer who is experiencing difficulty handling animated graphics.

The program, written in GFA Basic, features custom dialogue boxes which are easy to use and very colourful to boot. The first appears on loading the software and lists four options: Files, Edit frames, Animate sprite and Exit.

The last option is self explanatory so let's concentrate on the others, starting with Files.

Selecting this brings up another dialogue box with five file-related options. You can load Degas low resolution or Neochrome pictures into memory, and the Grab frame option enables you to grab small chunks of these to use as sprites in your animation.

Grabbing a number of sprites is tedious, as the one grabbed is always allocated to frame number one, overwriting whatever is currently stored there. So to pick up several you must grab one, exit, enter the sprite editor – which I'll talk about in a minute – copy it to another free frame, exit, re-enter the file menu, select Grab, choose the next, and so on.

What is obviously needed is an option to select the frame number before grabbing it.

The second item in the Files dialogue box enables you to load a sprite animation file. There are several demonstration files on the disc which give you a good idea of what the package is capable of.

When you've created your own you'll be able to load them too after saving them – the option is also on this menu. If you wish you can just load and save the palette associated with a sprite animation file.

Going back to the main menu, the second option is Edit frames. This takes you to a screen showing the 20 sprite frames held in memory – these will initially be blank unless you've loaded a file from disc.

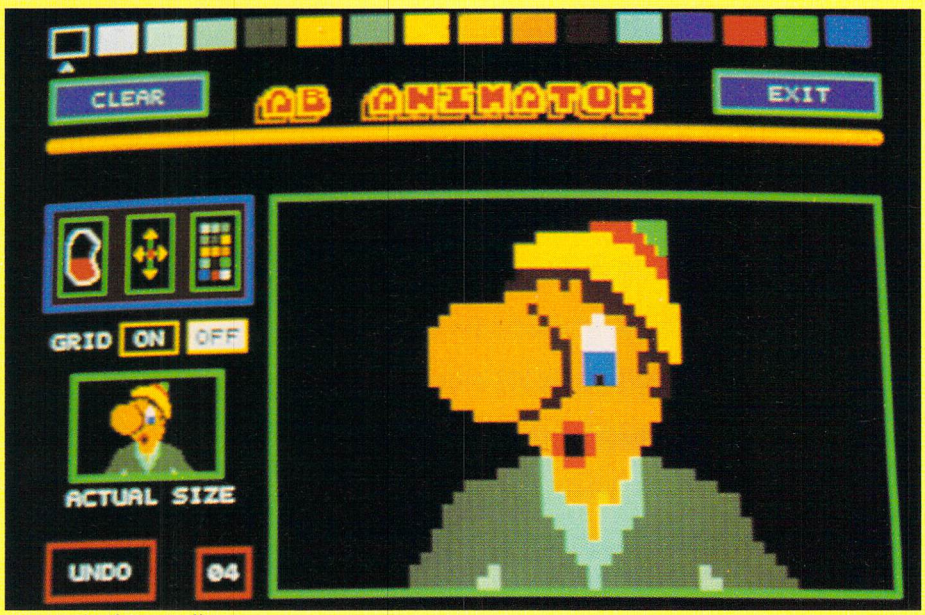
Here you can delete, copy, insert and print frames, or select one for editing. Clicking on a frame brings up the sprite editor. The frame is shown actual size – a fixed 56 by 33 pixels – and you work on a large magnified image.

The palette is displayed at the top of the screen and clicking on a colour selects it.

You can then paint on the magnified image by holding down the mouse button. The RGB values of the colours are definable, enabling you to alter the default palette.

There's a simple flood fill option and icons for flipping the sprite vertically and horizontally and scrolling it up, down, left or right. A useful Undo function cancels the last operation, restoring the frame.

Returning to the main menu, the remaining option enables you to see the sprite frames animated – called a film



The sprite frame editor

Turn to Page 40 ▶

◀ *From Page 39*

sequence. Selecting it brings up a further screen which is blank except for a control panel at the bottom.

There are icons for selecting the frame numbers to animate and the speed they flick through. The frames can be fixed in the centre of the screen or made to move up, down, left and right. The movement step size can be set in single pixel units.

The film sequence can be played forwards or backwards and wound to either end, rather like a video recorder.

I found the speed control had quite a limited range – at first I thought it wasn't working. There's no reason why this range couldn't be extended.

Another problem came when using the animator on a Mega ST with the blitter switched on. This totally messed up the frames and it was impossible to see the animation. It could have been merely a timing problem caused by the Mega's extra speed when carrying out blit operations.

The problem disappeared when the blitter was switched off.

Once your animation sequences have been created you'll want to incorporate them into your own programs. Background screens can be drawn using Degas or Neochrome and a utility called Convert will strip out the colour information – this is included in the animation file, so isn't required.

There are several example programs on the disc, written in both GFA and Fast Basic, and they are quite impressive.

However, you're pretty much left high and dry when it comes to writing your own programs. The section in the manual dealing with this topic is brief and sketchy. And although the procedures required to implement animation sequences are stored on disc for you to merge with your own listings, they are by no means simple to use.

This is probably the most complex aspect of implementing animation. I would have liked a few simple worked examples in the manual. I would say that unless you are a fairly good GFA or Fast Basic programmer you might have great difficulty using the package to produce your own animated displays.

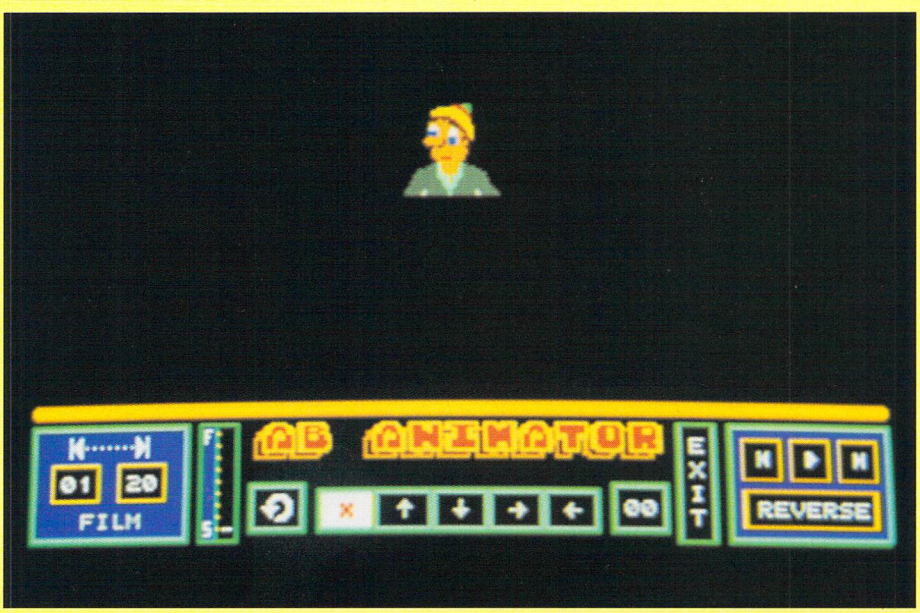
Having said that, although written in GFA Basic, the quality of the software can't be faulted – it's excellent. The accompanying manual is well written, though parts of it are too simple and it wastes too much space talking about basic concepts and processes in a Janet and John style.

More space should have been devoted to the quite complex technical aspects of animating the film strip sprites once created, and less to the more simple operation of the editor. The latter is quite straightforward, with clear icons and dialogue boxes for every option. The majority of operations are obvious, and the others I worked out by trial and error without even opening the manual.

The fixed size of the sprites – 56 pixels by 33 – is also a limitation and I would have liked some flexibility here – perhaps a choice of two or three sizes.

Despite these criticisms, overall I'm quite impressed with the software. When you consider its low price – £12.99 – the faults are really minor. This is a useful tool if you don't mind getting your hands dirty with a bit of Basic programming.

The 20 sprite frames



Viewing the animation sequence

FACT FILE

Product: A B Animator
Price: £12.99
Supplier: Ladbroke Computing, 33 Ormskirk Road, Preston, Lancs PR1 2QP.
Tel: 0772 203166

POINTS FOR:
Cheap. Easy-to-use editor and animator.

AGAINST:
Good knowledge of Basic programming required.

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Unfortunately, something went terribly wrong, and the last shuttle taking supplies to the almost completed space station never returned home. Someone must be sent to investigate and report back to Earth. This is where you come in – you've just been volunteered for the job.

The game starts just after you leave your shuttle on the surface of the space station. Northstar initially looks deserted and the life support systems are off, but within seconds hordes of aliens intent on your sudden demise are sprinting rapidly in your direction.

Fortunately, you aren't 100 per cent human. You have robotic implants which provide protection against the hostile environment, and an extendable mechanical arm which can be used as a weapon against the alien army.

Blast everything that moves...

Your task is to make your way to the project centre and restore the life support systems, rescuing any humans you come across. There are several levels to negotiate, though I don't know how many as I only managed to get to the second. On completing the first you descend a lift to the next lower level.

You are hampered by alien soldiers who come at you from all directions. If you hang about too long they'll sneak up behind you, so it's best to keep on the move. It wouldn't be so bad if the way was clear, but you'll find your route blocked by machinery and all manner of space debris.

Fortunately you're quite athletic and can jump on, or over most obstacles. However, jumping is fraught with danger. You'll find yourself being killed time and time again by leaping into some unseen danger just off the edge of the screen.

The action takes place in a smallish window in the centre of the screen and you view the action from the side. The screen scrolls smoothly as you run left and right and the speed is surprisingly fast.

The graphics are very bright and colourful, and the detailed backgrounds are excellent. The characters are superbly animated and equally well-drawn.

Northstar is a brilliantly programmed game and is extremely addictive. It has superb graphics, animation, sound and gameplay.

I can thoroughly recommend it.

Julie Boswell

Sound	***9***
Graphics	***10***
Playability	***10***
Value for money	***9***
Overall	***9***

Battling through the alien defences

SECOND sight

This was a smash hit on the Amstrad and I couldn't wait to see the ST version. I wasn't disappointed, Northstar is amazing. It's probably the most colourful game out on the ST, and the graphics have to be seen to be believed.

The action is fast and furious and the soundtrack constantly playing in the background is nice. Northstar is very addictive, and is one of those games that keeps you saying "Just one more go ...".

Andy Richards

On your bike!

Product: BMX Simulator
Price: £19.95
Supplier: Code Masters, Lowerfarm House, Stoneythorpe, Southam, Warwickshire CW33 ODL.
Tel: 0926-814132

ALTHOUGH Code Masters has been around since the end of 1986, this is the first product it has released for the ST. This particular game has been available on most other popular home computers for some time now, and has already become one of the best sellers.

The object is to race around many different courses within a time limit, competing alongside either another player or a computer-controlled BMX.

Once loaded, a menu will be displayed. At this point you select the controls for each player and the number of courses you wish to race – up to a maximum of seven. The high-score will also be shown. If you leave the game in this mode for too long a demonstration starts automatically.

Peddling is automatic – just steer

The game begins with the message "Riders ready, pedals ready, go" being shown at the bottom of the screen. The moment this is seen you should press accelerate – remember, one tenth of a second may decide between winning and losing.

Your ride over the bumps and ramps is very realistic, as the bike picks up speed. In order to qualify for the next course you must finish within the set time limit. If during a two-player game one of the players doesn't make it, the computer will automatically take over control of the other player from the next course on.

Whenever you complete a race you can sit back and watch where you could have done better by using the action replay option.

The main part of the screen is used to show the course and the two BMX riders – both are on the course at the same time. At the bottom various pieces of information are shown. This includes the time limit and the number of times you have to lap the course, as well as the individual players' details.

Although not quite the best graphics I've seen, I thought that good use had been made of the ST, especially for displaying the course. The presentation is fine with most options you could think of being well covered.

One point against the game: I found the control a little unresponsive, making play a bit on the difficult side at times.

Those of you who like to be sure of winning occasionally may find a few short-cuts which allow you to get ahead of the computer safely. Go and buy it – you won't be disappointed.

John Butters

Sound	*7*
Graphics	*9*
Playability	*6*
Value for money	*7*
Overall	*8*

SECOND sight

BMX Simulator is a faithful computer reproduction of that great sport. There are seven tracks, one-or two-player options and even a slow motion replay facility built in.

The graphics are excellent, the sound is good and the overhead display is clear. It's difficult to get to grips with, but once you've mastered the technique – a bit like riding a bike really – it's great fun to play.

Andy Richards

Racing certainty

Product: Out Run
Price: £19.99
Supplier: US Gold, Units 2/3 Holford Way, Holford, Birmingham B6 7AX
Tel: 021-356 3388

AFTER nine months US Gold has finally released this popular coin-op arcade game for the ST. Was it worth the wait?

You have been given an £85,000 Ferrari Testarossa convertible with a full tank, and a companion sitting in the passenger seat. The aim is to race to one of five finishing lines against the clock. There are five stages and when you enter each of these you will be awarded extra time.

As the starting lights change to green smoke pours from the wheels as you accelerate from standstill to nearly 300kph within seconds.

If the gears are used correctly at the bends you should have no problems, but if you take one too fast be prepared to end up sliding off the road and colliding with trees or rocks. The car is thrown into the air – this is superbly animated – making you lose valuable seconds.

To make the race more difficult, lorries, Beetles and Porches try their best to get in your way. However, if the going gets too tough there is an option to either decrease – or increase if you find things too easy – the number of vehicles.

Towards the end of each stage a row of trees appears in the middle of the road. The side you drive decides which route you take in the next stage. When you run out of time a course map will appear showing the route taken and how far you travelled along it.

The sound is quite near to that of the original arcade game. In addition an audio cassette holds the original soundtrack taken from the arcade machine. There are three different pieces – Passing Breeze, Splash Wave and Magical Sound Shower.

You can use either a joystick or mouse to drive the car. However, I had great problems with the mouse and couldn't even get past the first stage. It would doubtless get easier with practice.

I can find very little fault with the game, other than the three minute wait when loading, but this can't be helped as it's a massive game.

This is one of the best car simulations I have seen for the ST, and a great improvement on the versions released for other home computers.

John Butters

Sound	***8***
Graphics	***9***
Playability	***7***
Value for money	***8***
Overall	***9***

SECOND sight

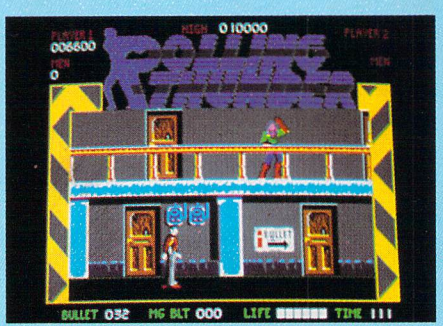
Out Run is excellent. I must admit, I've been spoilt by the arcade machine which is brilliant, and it's too much to expect the ST to live up to it. However, US Gold has done a good job and come up with a winner.

The graphics are well drawn and the animation is fairly rapid considering how much is going on. If you like car racing games, this is a must.

Andy Richards

Undercover escapade

Product: Rolling Thunder
Price: £19.95
Supplier: US Gold, Units 2/3, Holford Way Holford, Birmingham B6 7AX.
Tel: 021-356 3388



Watch out for ambushes

ACTION, excitement, entertainment – Rolling Thunder has the lot. It'll keep you glued to your joystick for many hours, despite the nauseating colour scheme.

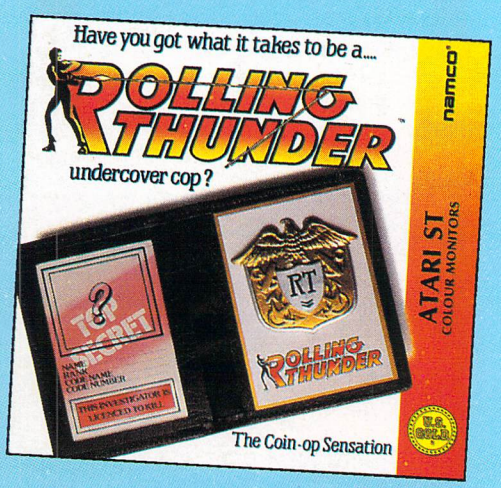
This horizontally scrolling cross between a platforms and ladders game and shoot-'em-up is based on a successful coin-op machine, and is a pretty faithful conversion.

You play the part of a dedicated secret agent, codename Albatross, sent to infiltrate and destroy the headquarters of a sinister organisation which is holding a colleague hostage.

The action takes place in a warehouse complex, as you shoot and dodge your way through the enemy agents against a time limit.

The baddies emerge from doors and off-screen, shooting as they come. If they don't shoot you, they'll beat you to death if they catch you, so keep moving.

You have to jump or duck to avoid their bullets, and gun them down mercilessly, at which point they crumple convincingly.

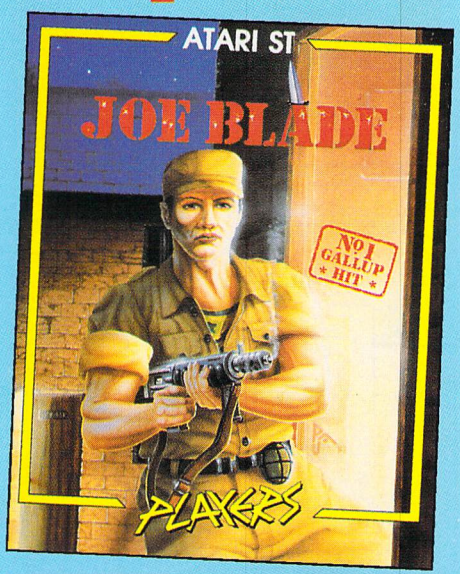


Above you is a balcony, to which you can leap to avoid enemies. The drawback is that the baddies can also stand on it and lob hand grenades at you, so watch your step. There are also doors to hide behind, some of which conceal stores of ammunition.

Both ordinary bullets – and mega-bullets which kill with one shot – must be picked up as you progress. When you complete each stage you get a bonus according to the time left, and you see a scene of the Geldra leader and his fanatically saluting army.

Finding your way through the maze of

Explosive adventure



Product: Joe Blade
Price: £9.95
Supplier: Players Software, Mercury House, Calleva Park, Aldermaston, Berkshire RG7 4QW.
Tel: 07356 71145

SIX of the world's top politicians are being held to ransom by a group of terrorists'. Their respective governments have refused to submit to the terrorists' demands. Instead they decide to enlist the help of Joe Blade, rock star and Kung Fu expert. Joe is the only man alive who has a chance of succeeding before the deadline expires.

The hostages are being held inside the highly fortified base of Crax Bloodfinger, the chief terrorist and all-round bad guy. Joe's mission is simple – sneak into the base, free the hostages, activate six explosive devices, then escape.

Joe Blade is a game of the arcade/adventure variety. You know the type – collecting objects, solving puzzles and machine gunning guards. I was very impressed with the graphics – the capabilities of the ST have been fully utilised in order to produce true cartoon quality.

Colour, shade and outline are used to great effect, so much so that you eventually forgive the programmer for the rather leisurely pace at which the game is played. As you play, various on-screen counters display how many cell keys, hostages and bombs you have collected, released and activated. Unfortunately, there is no mention of the state of your ammunition reserves, apart from a sign which appears as you attempt to fire thin air.

Your life expectancy can be greatly extended if you are thrifty with your bullets. Contact with a guard drains your energy at an alarming rate. However, your incredible physique and Kung Fu training enable you to leap over him without incurring energy loss.

The base contains many objects that will prove useful on your mission. An enemy uniform will allow you to walk

unharmed among the guards, food restores your energy, cell keys create new exits, and weapons replenish your ammo.

The most frequent cause of death are the bombs. There are six in the base and all must be activated before you can leave. They manifest themselves as huge grenades and walking over one calls up an activation code which initiates a 30 second countdown. Failure to rearrange the code into alphabetical sequence within the allotted time is fatal.

Joe Blade's graphics are its strongest feature, while the gameplay, although not particularly bad, tends to lack variation. I enjoyed playing the game, but I have a niggling doubt about its long-term appeal.

James Riddell

Sound	*5*
Graphics	*9*
Playability	*7*
Value for money	*7*
Overall	*7*

SECOND sight

Joe Blade reminds me of Eagle's Nest, but instead of the overhead viewpoint the action is seen from the side. The cartoon-like graphics are superb, but the animation could be better.

The playing area is quite large and there's lots to discover and explore, so it will keep you occupied for quite some time.

Andy Richards

catwalks, piles of crates, rows of tyres and shafts is difficult enough.

In the later stages, things become more hair-raising as you are attacked by even deadlier foes – fast-moving fire demons emerging from pools of lava, automatic lasers and savage panthers.

If you can fight your way through all the levels, you finally clear the command

Look behind all the doors

centre and face the enemy leader Maboo in single combat.

There are plenty of strategic tricks to learn. For instance, if you leap into the air, some of the hidden enemy agents will do the same, allowing you to shoot them without getting within their range.

The most enjoyable parts of Rolling Thunder are the antics of the masked, uniformed baddies, and the detail and colour of the background.

The music and sound effects are merely passable, and the action could have been a smidgeon faster. But overall it's an absorbing blast which will hold your attention for many plays.

Chris Jenkins

Sound	*6*
Graphics	*8*
Playability	*8*
Value for money	*6*
Overall	*7*

SECOND sight

Rolling Thunder is an exciting arcade adventure in which you take on the role of secret agent attempting to penetrate enemy headquarters. The place is crawling with enemy agents and the game runs at quite a hectic pace.

I didn't get too far into it, but it kept me coming back for more.

Andy Richards

Creepy crawly capers

Program: Spidertronic
Price: £19.95
Supplier: Infogrames, Mitre House, Abbey Road, Enfield, Middlesex EN1 2RQ.
Tel: 01-364 0123

THE object of Infogrames' Spidertronic is to move a spider creature around a 3D maze-like structure made up of flat tiles. Some have holes in them which you must repair by passing over a coloured tile and then moving to the hole to be covered. This bit is dead easy.

Of course, what would an arcade game be without a few adversaries? Here they take the form of bouncing balls which marmalise you if you touch them. Your defence, in true spider fashion, is a web which you can cast on a tile in front of you.

Unfortunately, the webs disappear after a few seconds and you can't pass over one (which is more of a disadvantage than it may at first appear). In any case the balls quickly regenerate.

Now I know the balls are there to make things difficult, but I found them annoying and frustrating rather than a challenge. Just to complicate matters, there are six different colours, each with their own movement patterns.

There are other frills, too, such as restarter squares which let you change the place from which you start after losing a life. You get points for everything including moving, and extra lives are available. That's basically the game. The hard bit lies in avoiding the balls and working out the best strategy for repairing tiles and completing the level.

Oddly enough, for all the memory available in the ST, there are only 10 game levels and each one is loaded separately from the disc.

However, you can edit and create your own using the built-in screen designer and there are an additional 10 test levels supplied.

Creating your own screens is fun – you can design screens without balls, and the editor is far easier to use than some other screen designers I've seen. The nice thing about this is you can play all the levels without having to work your way through them from number one.

The sound is sampled and quite excellent too, with a soundtrack by Ulrich. At the start of the program you are asked if you are using a TV or monitor and the picture is adjusted accordingly.

Spidertronic has little new to offer the avid ST gamer either in concept or execution. However, this is a reasonable if not spectacular game and certainly worth a look, especially if you like designing screens.

Ian Waugh

Sound	***9***
Graphics	***7***
Playability	***7***
Value for money	***7***
Overall	***7***

SECOND sight

This is an interesting game and slightly out of the ordinary too, giving it a bit of novelty value. You control a spider and have to fill in tiles in a 3D maze.

The sound is acceptable, the graphics are simple but good, and the scrolling is smoothly done. The added bonus of the screen designer prevents the game from becoming tedious.

Andy Richards

Fancy being a megalomaniac?

Product: Power Struggle
Price: £14.95
Supplier: PSS, 452 Stoney Stanton Road, Coventry CU6 5OG.
Tel: 0203 667556

THIS is a strategic/political game of world domination. The object is very simple: Gain political influence and invade all the other countries until your side rules every country in the world – not unlike real politics, in fact.

Each country has important information which can be read by clicking on the on-screen map with the mouse. For instance, if you click on England you will see it is strong in military and almost as strong in industrial power, and has a great deal of political influence.

You can, at any time during the game, see the status of enemy and neutral countries.

You and the computer, or another player, alternate turns. During a turn you must decide the actions of all the countries you control.

You can use either political or military means to get a neutral country on your side. Your opponent's countries may only be gained through attack.

At the start it's best to use the political influences of your countries to gain the affiliation of neutral countries.

It's smart to begin with the neutral countries with the greatest political influences so when they are finally on your side you can use their influence to win other countries.

When you completely influence a neutral country it changes to your colour on the world map. You control its army, industrial and political strengths.

You can also choose to attack a bordering country, supply industrial strength to allies, transfer the entire military strength from one country to an ally, and build armies or factories.

It is all very compelling, especially in areas where possession of countries is changing hands every other move, and calls for a great deal of thought and plotting.

The shell of the game, while it does the job, isn't very convenient. When you're at the stage of controlling several countries around the world it is a nuisance having to constantly click every one of them with the mouse then go to the icon panel at the side of the screen and decide what the country should do.

Power Struggle is very challenging until you discover the way the computer thinks. When you finally win one game and realise the underlining logic of how the computerised opponent moves, it becomes easier and a great deal less exciting.

Elliot Stein

Sound	***N/A***
Graphics	***6***
Playability	***7***
Value for money	***8***
Overall	***7***

SECOND sight

Power Struggle is a strategy game, and either you love this type of thing or hate it. I was bored after just five minutes, but I can see some players might find it a fascinating challenge.

The graphics are OK, but there is no sound to speak of. Try before you buy.

Andy Richards

STARGLIDER 2

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Thinking man's shoot-'em-up

Program: Trantor, The Last Stormtrooper
Price: £19.95
Supplier: Go!, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388

NOTHING quite like Trantor has appeared on the ST before. I'm not saying that it's astoundingly good, or a revolutionary idea, just that it should do well because it's a bit different.

This is a horizontally scrolling cross between a shoot-'em-up and an arcade adventure. In other words, you have to think a bit while you're blasting.

You control Trantor, a highly trained and well-armed soldier abandoned by his people on a hostile alien planet.

His mothership floats to the surface, lights flashing and radar spinning, extends landing legs, settles down – then explodes into fragments.

Fortunately, Trantor has left the ship, so he has the fun of fighting his way through eight levels of non-vegetarian meanies in his search for an escape route.

The spacesuited figure of Trantor is a thumping great sprite, nicely animated as he trots along the alien corridors in search of computer terminals. These each hold a one-letter clue to the password for the main computer.

Stand in front of a terminal, press fire, and you'll be given the code letter, or if you've already searched it, you'll be told it's deactivated. This is really the only way to tell that you've been all through a level, because the backgrounds are all much of a muchness.

Along the way you'll find lockers which contain fuel canisters for your flamethrower, defensive shields, and other useful weapons and supplies.

You'll need to use these carefully to fight your way through the hordes of flying aliens – looking like everything from pizzas to kitchen implements – which constantly smash against you.

Find the eight code letters, rearrange them to form a word and type it into the master computer on the eighth level, and you'll be given a beam location. Proceed to that area and the game's over.

Trantor is a nice straightforwrd game which would have been more appropriately priced as a budget title, but you should give it the benefit of a look in any case.

John Renwick

Sound	6
Graphics	7
Playability	7
Value for money	6
Overall	7

SECOND sight

Having played this on the Amstrad CPC I was expecting great things of the ST version. Instead I was disappointed – it's a straight conversion, and in my opinion, the graphics aren't quite as good.

It's still a good game though, and well worth playing. I just wish Go! had put a little more time and effort into the game.

Andy Richards

Tail of newt, eye of frog

Product: Warlock's Quest
Price: £19.95
Supplier: Infogrames, Mitre House, Abbey Road, Enfield, Middlesex EN1 2RQ.
Tel: 01-364 0123

DEEP within the bowels of the Earth, his malevolence the Evil One savours his latest victory over the powers of good. The Karna stone is in his grasp and it's only a matter of time before he learns the secret of its power. You must act quickly or all mankind will suffer.

While the program loads you are treated to a classic animated opening sequence – superb Hammer Horror style sound effects enhance an eerie gothic castle scene.

Warlock's Quest is an arcade adventure of the highest quality. The top third of the screen is devoted to a well laid out and easily read ancient scoreboard. You are well advised to keep an eye on the vitality reading – if this falls to zero you can kiss your Warlock goodbye.

To the right of this are two original and useful window features: The first is titled clairvoyance and provides forewarning of the next wave of ghouls. The second describes the objects you find – you need a total of eight specific items if you are to find the Karna...and the Evil One.

The remaining two thirds of the screen form the playing area, which gives a cross-sectional view of the surface level and the underworld. Both are drawn on an incredibly small scale giving a large playing area. By making full use of disc overlays Infogrames has created a game both complex and enormous.

Tremendous time and energy has been invested in the development of the monster population. On the first screen you are treated to the chilling sight of zombies struggling to free themselves from the soil before ambling in your direction.

In one of the underground sections stands a huge grey giant – he doesn't appear to be anything special until he opens his mouth and hey presto – Warlock kebab.

In addition to the special items you need to collect, there are potions and spells that will replenish your vitality and power.

Unfortunately it's all too easy to get into the habit of picking up everything you see – sooner or later you'll find the special potion bottle and end your days as a genie.

Probably the greatest strengths of Warlock's Quest are its humour and ingenuity – never in the field of human conflict has one reviewer been suckered into so many "why didn't I see it coming?" deaths.

Carol Barrow

Sound	8
Graphics	8
Playability	10
Value for money	8
Overall	8

SECOND sight

Warlock's Quest is a well-written arcade adventure. There's plenty to do and lots to discover on each new screen. The graphics are good, though they are a little too small, and the colours chosen are rather dull – I could hardy see the screen in a bright light. It's good fun and it'll keep you occupied for quite some time.

Andy Richards

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Around the world

Program: Bob Winner
Price: £19.95
Supplier: Loriciels/Elite, Eastern Avenue, Lichfield, Staffordshire WS13 6RX.
Tel: 0543 414188

THE game sounded good. Multiple fight mode, a new generation in graphics, digitised images, wild swamps – I couldn't wait to have a go.

The Eiffel Tower loomed in the background as Bob Winner awaited my instructions. I moved off, walking warily to the screen edge. The new screen showed me in front of Notre Dame Cathedral with a Frenchman pirouetting daintily, trying to kick my head in.

I could only manage a pathetic retaliatory kick in the ankle before the first of my nine lives was expended. Judging discretion to be the better part of valour, I legged it.

Next I bumped into a boxer underneath Big Ben who promptly tried rearranging my teeth. There was a boxing glove on the floor – I picked it up and pressed the transform key.

Suddenly I, too, was a boxer, with a new range of fighting commands at my disposal. A few right hooks and straight lefts and I had defeated my assailant.

The boxer dropped a key. I picked it up and it was displayed in a panel below the playing area, along with the boxing glove. In the next screen I found a boot, the very item required to fight the kicking Frenchie. He too was quickly despatched with a couple of high kicks and head butts and gave up a second key as he expired.

Along the way life was made difficult by flying knives, bullets, giant wasps, rolling barrels and bouncing balls, which all depleted energy on contact. Swamps, volcanoes – more like mole hills and no more awesome than a bad case of erupting acne – landslides and quicksands were all to be avoided on pain of death.

There was a third fighter to confront – a gunfighter in New York. I'd picked up the pistol and was ready to face him. If I could kill him I would find the third and final key, allowing me access to the ultimate part of the quest and a number puzzle to crack. But by this time I was really losing interest.

Nicely animated fighters and occasional pretty backgrounds don't make an entertaining game. The middle distance between the figures and backgrounds is empty yellow nothingness, and despite the famous landmarks, there was no sense of adventure or purpose to the game.

Despite a couple of nice touches, Bob Winner failed to appeal to my imagination, spirit of adventure or sense of fun – not so much a winner as an also-ran.

This is one to try before you buy.

Niels Reynolds

Sound	***6***
Graphics	***7***
Playability	***6***
Value for money	***6***
Overall	***6***

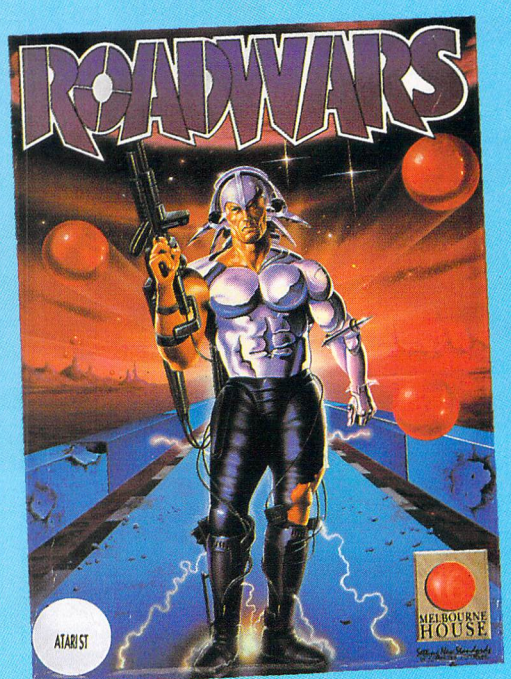
SECOND sight

I wasn't too impressed with this offering from Loriciels. Some of the graphic backgrounds are nicely done, but it's the gameplay that lets this arcade adventure down.

It's just too dull and doesn't seem to stimulate any interest or get the adrenalin flowing and heart pumping. I'd give it a miss.

Andy Richards

Bright sparks don't lose



Program: Roadwars
Price: £19.95
Supplier: Melbourne House, 8-10 Paul St, London EC2A 4HJ.
Tel: 01-377 8411

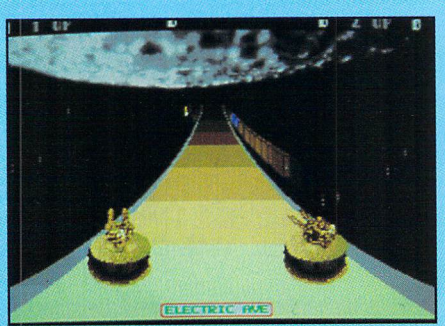
ROADWARS is one of a new generation of 16 bit games. Rather than being licensed from a Japanese company's coin-op, it was developed specifically for Arcadia's Amiga-based arcade machines and transferred directly to the home computer.

Set in the 25th century, when interspacial roadways link moons and planets, the plot puts you in control of a battlesphere assigned to clear the beseiged roadways.

Above the play area is a digitised image of the moon, rotating as the roadways flash past.

The movement of the roadways is conveyed quite effectively by having the segmented border colours flash – a clever effect, though it becomes a little hard on the eyes.

On the roadway appear two battlespheres, both of which can be controlled in a two-player game. Each is armoured with a protective shield, which can be lowered with a push of the joystick to reveal your laser cannon. The shield drops automatically if you fire your laser.



The spheres can be manoeuvred with the joystick, mouse or keyboard, and the lasers aimed independently with diagonal movements.

Across the roadway leap electric sparks which destroy you unless your shield is up, in which case you can pass through in a blaze of electrical discharge.

You can deactivate the sparks by

Super sequel

Product: Impossible Mission 2
Price: £19.99
Supplier: US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388

SEVERAL years ago you volunteered for an Impossible Mission, which resulted in the imprisonment of Elvin Atombender, well known psychotic genius and all round bad guy.

Elvin is now out on parole and the underworld grapevine indicates he is up to his old tricks again. It is for this reason that you are being recalled to embark on the sequel – Impossible Mission 2.

The Atombender Empire centres around an eight-tower complex in Los Angeles, each tower separated from its neighbour by a security coded door.

The object is to collect a series of short musical sequences hidden inside six of Elvin's eight safes.

With the music safely in your grasp it is just a matter of playing the tunes in the correct sequence and the lift to Elvin's penthouse will be at your disposal.

Once there you can destroy the master computer and the world will be safe once more.

Each time you start the game you'll find yourself in a different one of the eight towers. A small display at the bottom of the screen shows the number of rooms contained in the tower, and the number and position of all the exits.

Access to the rooms is by means of service elevators which run either side of the tower.

Readers who are familiar with the original game may experience an overwhelming sense of déjà vu when playing the second mission. Not that I'm complaining – the original program still ranks as one of the best games on the market.

Each room in the tower has been constructed using a combination of aerial platforms and cleverly positioned vertical and horizontal lifts.

The original contingent of laser firing robots has now been supplemented with several new models:

The first is a caterpillar-tracked device that has a nasty habit of pushing you over the edge of platforms. Number two rumbles aimlessly around the room riding on the lifts and generally being a nuisance.

Most of your time is devoted to searching the objects in each room. These may contain code numbers to access the next tower, or tokens that can be fed into any of Elvin's computer terminals.

With the aid of the correct token you can temporarily deactivate the robots, reset lifts to their initial positions, lay mines, position a time bomb next to a safe, or turn on the lights in a darkened room.

The ST version of Impossible Mission 2 takes the mind bending puzzles of the original game and combines them superbly with immaculate sound and graphics.

Nev Astly

Sound	8
Graphics	8
Playability	8
Value for money	8
Overall	8

SECOND sight

This sequel to the original superb platforms and ladders adventure is just as good as I remember it. The only slightly offputting feature is that it's perhaps too similar, and it would have been nice to see something a little different.

If you liked the original, you'll feel at home with this.

Andy Richards

shooting out the blue control panels at the side of the roadway. But take care – they prevent you from plummeting off into the blackness of space.

There are also red panels situated close to the blue ones: Shoot one and the spark will disappear, reappearing elsewhere.

When you have cleared the roadway two green panels appear. Shoot them and you fall through a gate to the next stretch of roadway.

To get as far as possible along the roads, you need to cooperate in destroying the sparks and rolling red spheres which knock out your shields.

You can collect extra weapons along the way. Rotating spheres take up orbits around your craft, and add to your firepower.

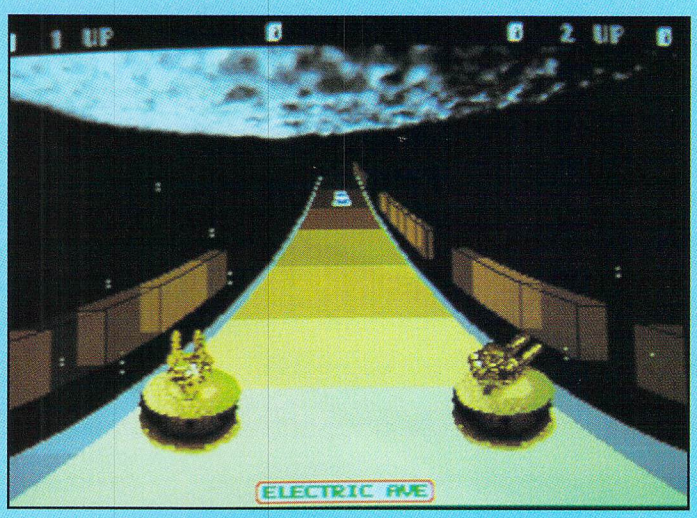
Additional hazards include laser-shooting satellites which appear at each side of the track, chevrons marked on the roadway, and spikes which will destroy your sphere even if the shields are up.

The sampled sound effects are great, though the music is unremarkable and soon becomes annoying.

Roadwars features plenty of action, high quality graphics and an original story line. Unfortunately there isn't much variation, and I doubt whether your interest will long outlast the initial thrill.

Chris Jenkins

Sound	8
Graphics	8
Playability	6
Value for money	6
Overall	7



Shoot the panels at the side of the road

SECOND sight

This is a pretty neat game, featuring nice graphics and an unusual scenario, though I'm convinced I've seen it before – a few years back on the Spectrum perhaps?

It's fun to play initially, but I wonder if I'll still be as hooked on it this time next month as there seems to be little variation in the gameplay.

Andy Richards

Better bit of blaster

Product: Foundations Waste
Price: £24.95
Supplier: Exocet Software, Newfield House, High Street, Tunstall, Stoke-on-Trent, Staffordshire ST6 5PB.
Tel: 0782 811002

THE packaging to Foundations Waste vaguely recounts the story behind the game – some drivel about only a single ship being able to penetrate the defences of The Waste. But who cares why or where they're going, this is the best all out zap and blaster that I've seen on the ST.

Foundations Waste is a game of the vertical scrolling genre – the background moves downwards at a steady rate, while your ship is free to manoeuvre anywhere within the confines of the screen.

The first thing you notice is the standard of the graphics – I have never seen such a multitude of complex, brightly coloured sprites on screen at one time. There were even occasions when I lost a life through sightseeing!

It is not unknown for a game that scores highly in the graphics department to suffer from pitifully slow animation, thereby spoiling the game. This is not the case with Foundations Waste and I was pleasantly surprised by the action's speed. OK, it's not mega-quick, but I never once found myself yearning for more power.

Ground defences in section one – there are five – consist of immobile gun turrets and motorised tanks which provide a constant barrage of background flak. Airborne attack is present in the shape of squadrons of alien spacecraft – fast, evasive, accurate and potentially suicidal.

As you fly up screen you will encounter the occasional pulsing, power sphere, and flying over one will modify your ship in some way. The standard double-action laser cannon may be replaced with a single torpedo.

This beast is not halted by the first object it encounters, it passes straight through, destroying ship after ship. A green haze surrounding your craft indicates the presence of a force shield – why shoot 'em when you can ram 'em?

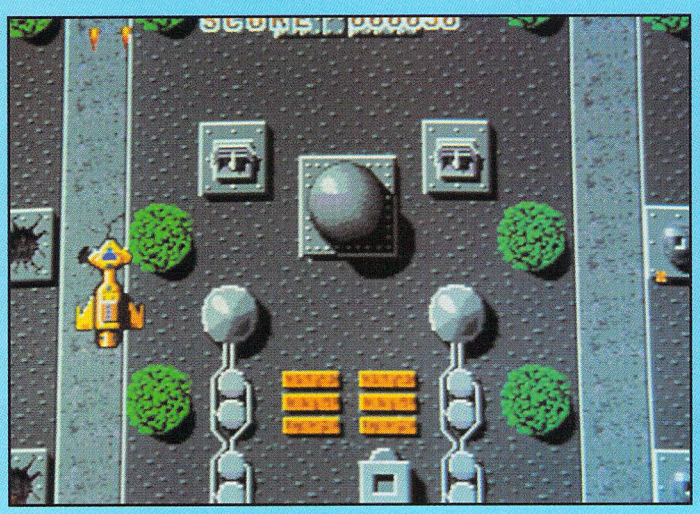
Further adaptations can be acquired by docking with new sections of spaceship – the first enables you to fire simultaneously left and right. Section two is a real beauty – pressing the fire button launches two missiles in addition to your laser bolts. Jettisoned to the left and right, the missiles lock on to the first available enemy vessels.

Towards the end of the first section two huge vehicles rumble into view – these are invulnerable to your weapons and your only chance of survival is to shoot their missiles.

Foundations Waste has all you could want in an arcade game – superb graphics, lots of action, and sufficient variety to keep you playing for weeks.

James Riddell

Sound	***8***
Graphics	***9***
Playability	***9***
Value for money	***8***
Overall	***9***



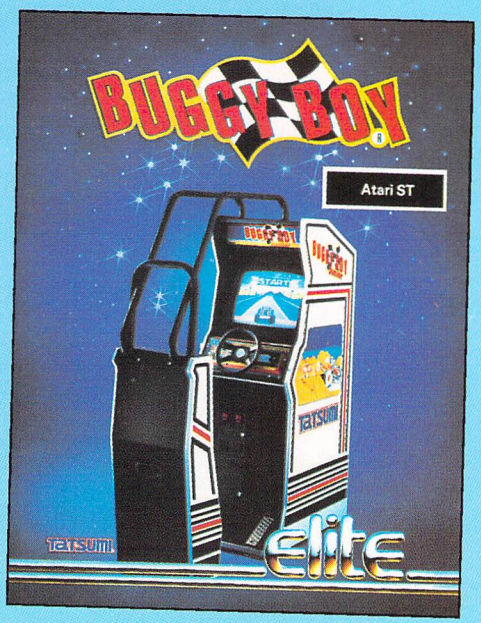
SECOND sight

Oh, no! Not another vertically scrolling shoot-'em-up. It must be all of a week since the last one was released. Still, it's professionally done, has excellent graphics, good sound and so on.

What can I say, except that once you've seen one, you've seen them all. If you like this sort of thing it's a good blast. But you've seen it all before.

Andy Richards

Fast lane fun



Product: Buggy Boy
Price: £19.99
Supplier: Elite, Easter Avenue, Lichfield, Staffs WS13 6RX.
Tel: 0543 424188

DID you fall asleep at the controls of Test Drive? Did Crazy Cars drive you up the wall? Let's face it, you can count the number of 3D racing games for the ST on the fingers of one hand, and none of them are particularly exciting.

Good news then to witness the release by Elite of the Tatsumi coin-op, Buggy Boy. This is far from a serious or high brow simulation, and concentrates more on entertainment than realism.

There are five courses to tackle in your bouncing buggy. Whichever you pick, each of the five stages gets progressively harder. This is a race against the clock – complete one stage in time and you can move on to the next.

Driving the buggy is fairly simple as it is only equipped with two gears. Joystick forwards accelerates, with the reverse movement applying the brakes.

Lining up to get in the way are a plethora of obstacles, some indigenous to certain tracks. In fact the sheer variety of scenery is one of the points in Buggy Boy's favour. Boulders loom up frighteningly, fences seem to sneer, and who knows quite what is lurking in the tunnels?

Some of the screen layouts are quite fiendish, while others are simply clever. These are designed so that only by performing certain hair-raising manoeuvres can they be successfully completed.

Normally the buggy has four-wheel drive, but to get through narrow gaps between trees, boulders, fences, piles of wood and bushes, it is necessary to run over a tree stump or rock. This tilts the thing on to two wheels, which is just as controllable, but now you can, if you have a steady hand, slip through those impossibly narrow gaps.

The other spectacular trick is to hit the logs lying in the road, and soar into the air over the obstacles.

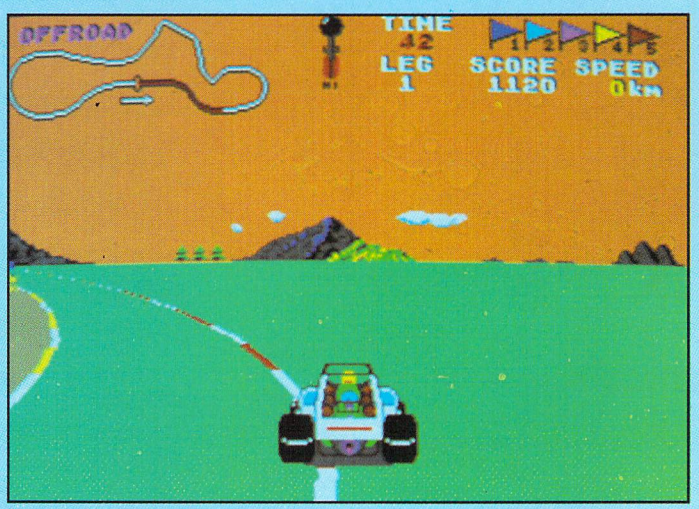
Although there's no way of gaining extra time within a stage, there are time gates which add a couple of extra seconds to your allotment for the next stage – if you get there that is.

One thing you can't accuse Buggy Boy of being is slow. Everything literally hurtles towards you, and though the control isn't perfect it is good enough to enable the skillful to succeed while the clumsy fall by the wayside.

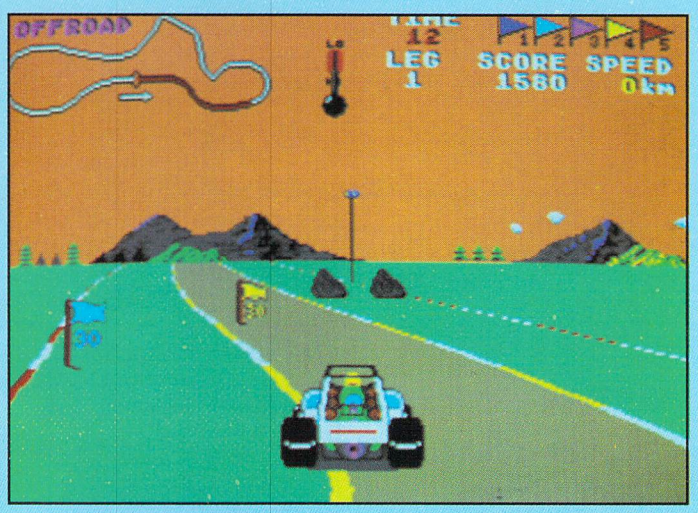
With interesting variations like rivers and lakes, tunnels and climbable embankments, and five courses to race down, Buggy Boy delivers not only in the enjoyment stakes, but also has enough to stimulate that one-more-go feeling.

Mark Luckham

Sound	***7***
Graphics	***8***
Playability	***9***
Value for money	***8***
Overall	***8***



Try and keep the buggy on the road



Avoid the obstacles

SECOND sight

This isn't a true simulation by any stretch of the imagination, but it is fun, exciting to play and quite addictive.

The different stages add a bit of variation to the game, and there are plenty of obstacles to keep you on your toes.

The graphics, while not brilliant, are acceptable, and the sound is reasonable. Of the 3D racing games around at the moment, this must rate as one of the better ones.

Andy Richards

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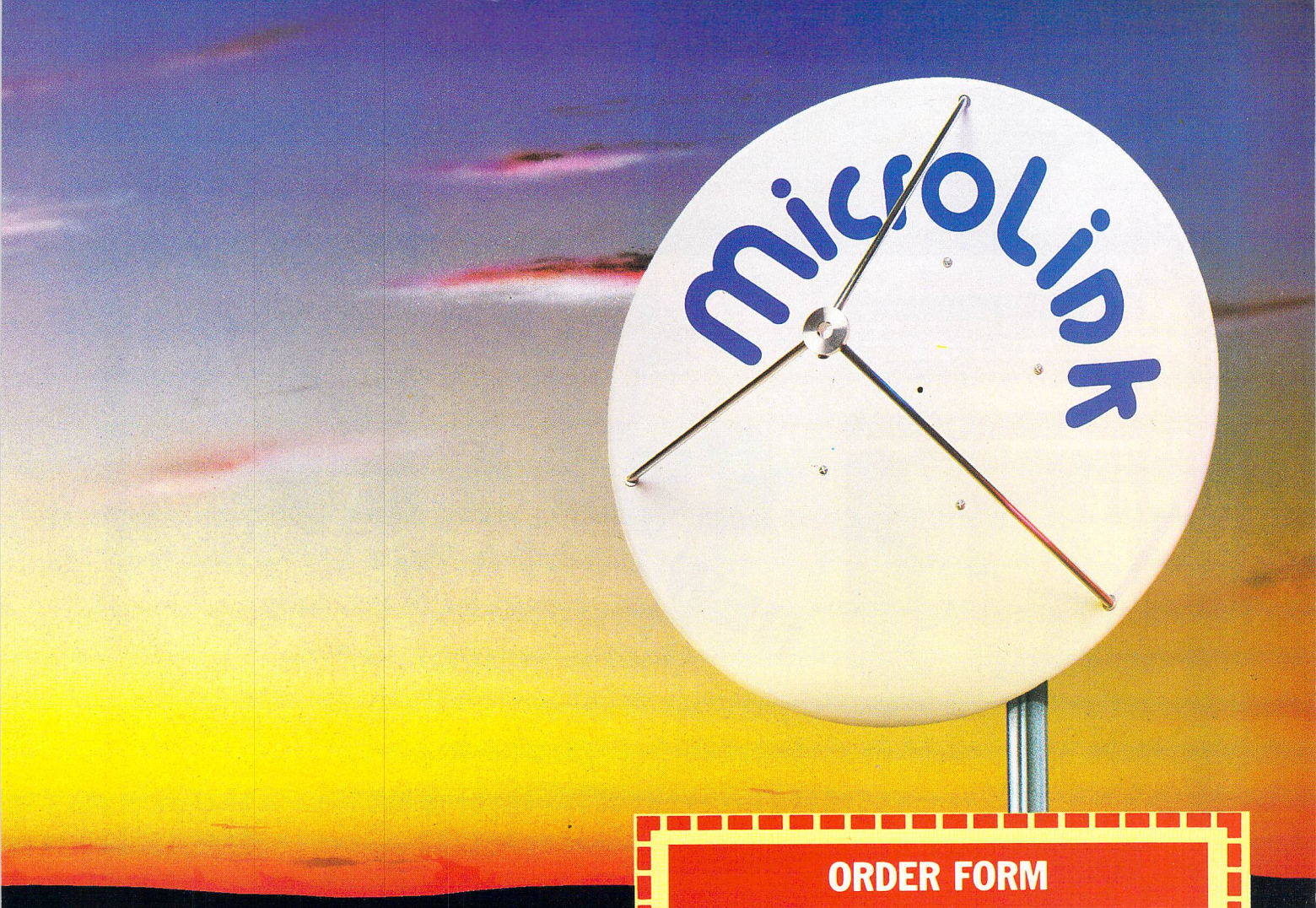

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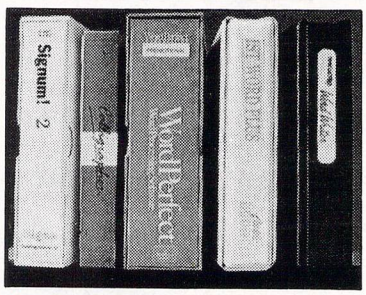

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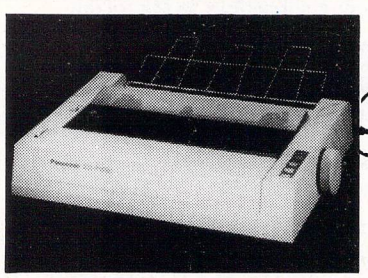

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Art software that took a quantum leap

Ron Massey examines a powerful paint package giving a vast palette of 4,096 colours on the ST

THE original concept of Quantum Paint, from Eidersoft, was that it should be a drawing program similar to Degas Elite, but with several important exceptions. As often happens in the development stages, the current version of the software reflects a definite improvement on its original specification.

Quantum Paint incorporates a comprehensive range of facilities for producing original artwork, modification of digitised pictures and memory-efficient storage of animation cells.

Access to Quantum Paint's features is via two main icon-based menus. The control menu consists of three panels and controls the drawing tools, palette selection and animation icons.

The uppermost panel displays the colour wedges and palette selectors on the left, program identification and memory remaining in the centre and an insert panel displaying the brush icons on the right.

To the left of screen centre are a column of five rectangular keycap icons labelled, Mode, Paint, Stipl, Patrn and Solid.

By selecting the Mode icon you can set the screen for the range of colours you will be working with. A number of start-up options include setting the display mode for 50 or 60Hz (the latter increases the effective screen height and reduces any tendency for flicker), and for the colour range available for the current drawing – this is shown in the table below.

Beneath the palette selector, the large panel to the left of the Mode and Paint control icons provides access to all drawing options, comprising icons for freehand line drawing and erasing, rubberbanded lines, rays, polygons, circles, squares or rounded cornered rectangles, filled polygons, circles and rectangles – again with square or rounded corners.

Completing the catalogue of drawing aids, Quantum Paint also includes conventional facilities for flood fill – in 128 colour modes – magnifying, moving or copying selected areas of the current drawing and spray painting.

To the right of the Mode and Paint control icons three boxes display the current colour, samples of one of the six character sizes and in the current font style (the Font box), one of the 38 stipple/texture patterns (the Fill box), and one of the six line widths available for the rubberbanding drawing options (Line box).

Double clicking on the Line box allows you to change single pixel width lines to one of the six types of broken line. Double clicking on the Font box offers you the options of several types of character modification for italics, outlined and text characters in normal representation, inverted or vertical starting from either the top or the bottom of the screen.

Icons to the left and right of these boxes enable you to alter the size or pattern of the current option. In the case of the Line box, the line type and width displayed is for use with rubberbanded options using straight lines only.

Beneath the boxes in the main menu are three icons which allow you to select which of the two drawing screens you wish to work on, and the second menu. This further menu has been completely revised and replaces the conventional Gem menu bars implemented in the first release of Quantum Paint.

Colour options

The method used for selecting colour depends upon whether you are in medium or low resolution, and if in the latter, which of the three colour drawing modes you are using.

In the standard system mode you can have up to 128 colours on the screen. Super palette extends the colour range up to 512 colours on screen and interlaced palette provides a maximum of 4,096 colours.

Modification of the default colours may be made in two ways. By double clicking on the colour patch you wish to change, you are offered a sub-menu with conventional RGB slider controls. After altering a colour, you have the option of viewing the current drawing in the altered shade, and to cancel or accept the alteration.

Alternatively, you can select the Pick option from this menu, and you are offered the complete colour range available in the current mode and can select

Colour mode	Resolution	Palette range
Standard system	Medium	128 colours
Standard system	Low	128 colours
Super palette	Low	512 colours
Interlaced palette	Low	4096 colours

The colour options

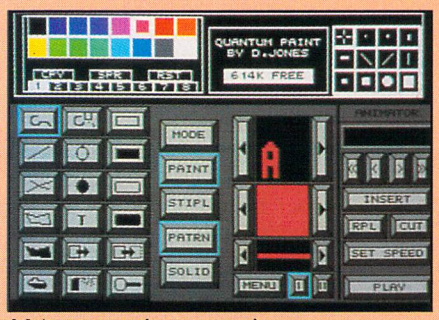
Turn to Page 60 ▶

◀ From Page 59

from a colour step wedge tablet for a specific RGB value from 000 to 777.

Looking at the standard palette first, you have the option of using a palette consisting of 16 different colours over the entire screen.

If you are going to draw, say, landscapes which might contain well defined areas with a predominence of colours – blues for the sky, browns and greens for the landscape – you can divide the screen up into eight positionable horizontal bands and assign a distinctive 16 colour palette in each band.



Main menu selector panel

Palettes are selected by clicking on Menu from the main screen and palettes one through eight, and positioning the bands on the drawing area each one represents.

The next stage for setting up your colour range is to select each palette in turn, and copy one of the colours to another colour patch. Select the Spread option and the palette will then consist of a range of colours in the chosen shades. Alternatively, clicking on one of the colour patches enables you to set the selected colour to a particular shade.

Colours galore

In the super colour mode you can have 512 colours for drawing. Individual colours are set from each of the three eight-position RGB sliders. In practice, you are limited to about 35 to 40 colours per screen line.

One of Quantum Paint's most powerful features is that you have the option of having 4,096 colours on the screen at once. Colour selection is made in the same manner as used in the super palette mode with the exception that the RGB sliders each have 15 different positions.

You can use up to 4096 colours on a single screen, but because of processing complexities, a few limitations are imposed by this facility in order to reduce excessive time delays when converting the image from pseudo 10 bit plane screen map to super palette display.

While you are adding to the current drawing, colours will be displayed in draft mode. Selecting Update from the second menu will allow you to set the time interval required between non-activity of the mouse and display of the picture in the true colours.

Alternatively you may elect to force the screen into true colour display mode by selecting On demand from the Update option. The screen will revert to the display mode by pressing the Alternate key. Movement of the mouse will change the screen back to draft mode.

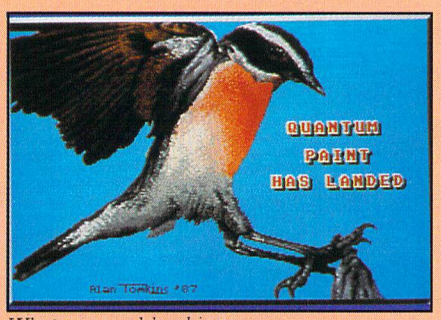
Animation

There are particularly good facilities for producing full screen animation. The animator panel consists of a four-digit frame counter, slow, fast forward and rewind facilities, frame insert and cut. If you make an alteration to one of the frames in a sequence, selecting the RPL icon will update the frame in the storage buffer.

A full range of file handling facilities have been provided. Unless otherwise specified, pictures are always saved with the PBX file extension. Pictures originated in most of the popular range of drawing packages will load into Quantum Paint, and it will accommodate .PBX, .NEO, .PI1, .PI2 and .PI3 filename extensions.

Other options are to load and save animation sequences and a simple monochrome screen dump.

Although it is provided with two drawing screens, each of which may have individual palette configuration, an undocumented feature allows you to use the animator to have a large number of individual pictures – within the limits of the available memory – with the sole restriction that the entire group of frames is confined to a single palette.

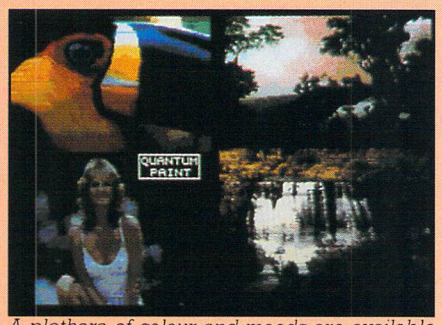


What you could achieve

As you start each cell, enter it into the animator as a frame. Once you have the prerequisite number of frames, you can edit each individually and update the frame store with Cut and Insert.

Individual frames may be saved as pictures by selecting the frame number, entering the second menu and using the Save option.

Judging from the number of empty or untitled icons on the second menu, eidersoft will be providing more powerful upgrades in subsequent releases.



A plethora of colour and moods are available

However, several features mentioned in the manual were surprisingly missing from the review version. Most notable among these were the option for anti-alias – a smoothing tool – a smear option, and one for setting the manner a current colour will interact with existing colours in XOR, OR, AND, ADD, SUB and normal modes.

Aptly described in the manual as a fun package, Quantum Paint is additionally a powerful drawing tool which has a wide range of applications.

Conclusions

The current release of Quantum Paint reflects the care and attention arising from customer feedback received by Eidersoft from the earlier version.

Once all the inevitable teething problems inherent in almost all completely new programs have been ironed out, it is destined to be one of the best drawing packages on the market.

If you have ever used Degas Elite you will find updating to Quantum Paint simple as the concepts are the same. Equally, users new to drawing programs will find the package a comfortable program to get to grips with.

I particularly liked the author's lack of clutter, which, at the same time, provided most of the powerful features of a dedicated animation editor.

One of the most notable features is that it is easy to use. The manual is a useful navigation aid for finding some of the finer features not readily apparent, and can very soon be dispensed with – the acid test of a well designed program.

FACT FILE

Product: Quantum Paint
Price: £19.95
Supplier: Eidersoft, Unit 4, Stannets, Laindon North Trade Centre, Basildon, Essex SS15 6DJ.
Tel: 0268 541212

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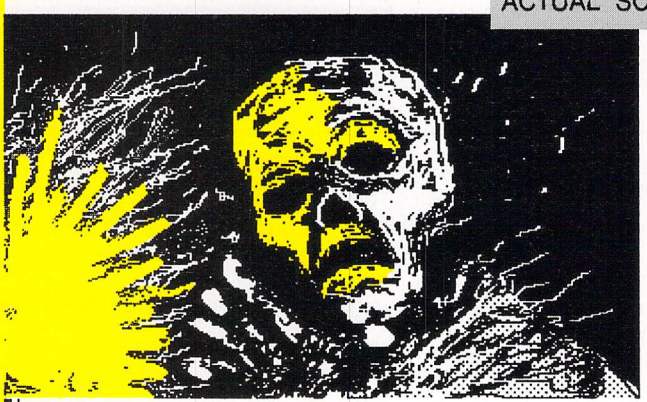

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If you have anything about your favourite arcade game that you feel would be of interest send it to:

Arcade Corner, Atari ST User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

TERRAMEX TAMED

THIS month's Arcade Corner is devoted to a map and solution to GSE's Terramex – reviewed in last month's *Atari ST User* – and is provided by Robert Edge of Dorking, Surrey.

First of all select Fortisque-Smith. Pick up the hoover and fly to the top of screen 14. Now take the expanding bridge, go right and right again to screen 16. Pick up the umbrella. Now go all the way back to the cloud at the top right-hand corner of screen 14.

Move left to screen 13 and quickly run down to the bottom of the cloud and jump to the gunpowder before Fortisque-Smith shakes his head and refuses to go. If you fall short of the cloud and start to drop down, quickly use your umbrella.

Pick up the gunpowder, and go back down to screen 2. Go right, pick up the flute, go right again and when you pass the snakes make sure you are playing the flute, otherwise you will be killed.

Go to screen 6, pick up the cricket ball and climb down the well to screen 26. Go right, move to the end of the wall and use your expanding bridge – it will go across the wall to the other side.

Go right to screen 28 and use your flute. Move right until you get to screen 30. Jump onto the spring and you will bounce up to screen 10 where you can pick up the bellows. To get down, hold the flute and jump next to the monster – a rope will appear. Slide down it and go to screen 9.

You will now be standing next to a balloon. Hold the bellows, and climb into the balloon. It will rise and as soon as you get up to screen 20 steer to the right until the balloon stops rising. Drop the bellows and you will float down.

Pick up the pills and move to screen 22. Jump down while holding the umbrella, and you will find yourself standing next to a cannon. Use the gunpowder and get into the cannon – it will fire you across the pool.

Jump down, again holding your umbrella. Move left to screen 37. Hold your cricket ball, and you should now automatically throw it at the stumps. When it hits them the formula will appear. Pick it up.

Move right until you reach screen 40 and walk right across the lift to screen 41. Guide your man to collect the energy crystal, and go back to room 40. Walk on to the lift and move down to screen 49.

Move left until you reach screen 48 – to get past the bridge you have to keep jumping. When you reach screen 47 take the battery and go to screen 45. When you get there, jump on the trampoline to bounce up to screen 36.

Take the switch, go left and jump down while holding the umbrella until you reach the bottom of screen 44. Now go left, pick up the coat hanger and go left again.

You will now be in a room with a transporter and a plate. Place the energy crystal on the plate and step into the transporter, you will be transported to screen 60.

Move left to screen 59. Hold the anti-radiation pills and pick up the atomic pile. Move right to screen 61. Put the switch on the round thing on the wall, move to screen 62 and a bucket will take you to the other side.

Move right until you reach screen 65, pick up the red button and go back to screen 63. Now turn the switch and go back to screen 62 where the bucket will transport you to the other side. Go to screen 60 and enter the transporter – it will take you to screen 34.

Go to screen 23, and go down until you reach the lift. When you are on it keep going down until you reach the bottom. When you are there, go right until you get to screen 58, go up the ladder and pick up the cup of tea.

Now go all the way back to screen 56. Go to the anvil holding the silver lining and you will make a cross. Move up to screen 51 and go right into 52. Hold the cross to make the man run away without killing you. Move to screen 53 and hold the formula – a bridge will appear over the ray.

Move to screen 54 and at last you will meet the man himself – Professor Eyestrain. He will ask for the formula, atomic pile, battery, coat hanger, red button, and cup of tea. Then when you have given him all the objects the game will at last be completed.

Turn to Page 64 ▶

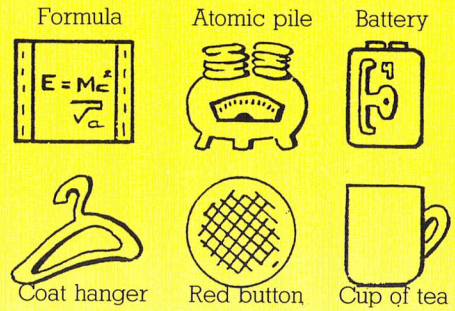
TERRAMEX

THE MAP by Robert Edge

ATARI ST USER

Gunpowder 13	Expanding bridge 14	Party manifesto 15	Silver lining 16	Unicycle 17	Umbrella 18	Fall down 19		Top of hill 20	Anti-radiation pill 21	22		
1	Start Hoover 2	3	Flute 4	Snakes 5	Well Cricket ball 6	7	8	Balloon 9	Bellows Spurs 10	11	Telescope 12	
Gunpowder 23	Flash gun 24	25	26	27	Snakes 28	29	Spring 30	31	32	33	34	
35	Switch 36	Cricket stumps 37	38	Beer barrel 39	Lift 40	Energy crystal 41						
42	Coat hanger 43	44	Tram-poline 45	46	Battery 47	48	49	Monsters 50	51	52	53	Professor Eyestrain 54
55	56	57	Tea 58									
Atomic pile 59	60	61	62	63	64	Red button 65						

ITEMS TO GIVE TO EYESTRAIN



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A thoroughbred among micros

Francis Botto ventures inside the ST following Jack Tramiel's footsteps

IT is hard to believe that little over two years ago Atari was generally regarded as a manufacturer of personal computers of a more, dare I say, entertaining nature. The sort of company that thrived on the computer games industry, anticipated by no one, but exploited by everyone.

Atari's evolution has spanned the A-to-Z of computer advancements, and it seems to have been around for ever, merely waiting for its chance to interject real innovation. Like the ST for instance, which is presently out on its own as a competitively priced and advanced machine.

Like many other success stories, the ST is often attributed to Jack Tramiel, but in actual fact work began on the ST more than a year before his arrival at Atari. Nevertheless, it's almost certain his aggressive marketing campaigns and autocratic company leadership – for which he is well known – has turned the ST into a commercial success.

And under strict observance of Jack Tramiel's maxim "It will be done", the ST was fully-developed, manufactured, and in the shops almost on time. You don't become one of that extremely rare breed by being undetermined.

But on a darker note, amid such doggedness to get it into the shops on schedule, the ST wasn't what it could have been. The Basic on disc wasn't a good idea, but there again it did allow third party companies to produce alternatives cheaply. It's only a pity they didn't allow the customer to benefit from the obvious savings.

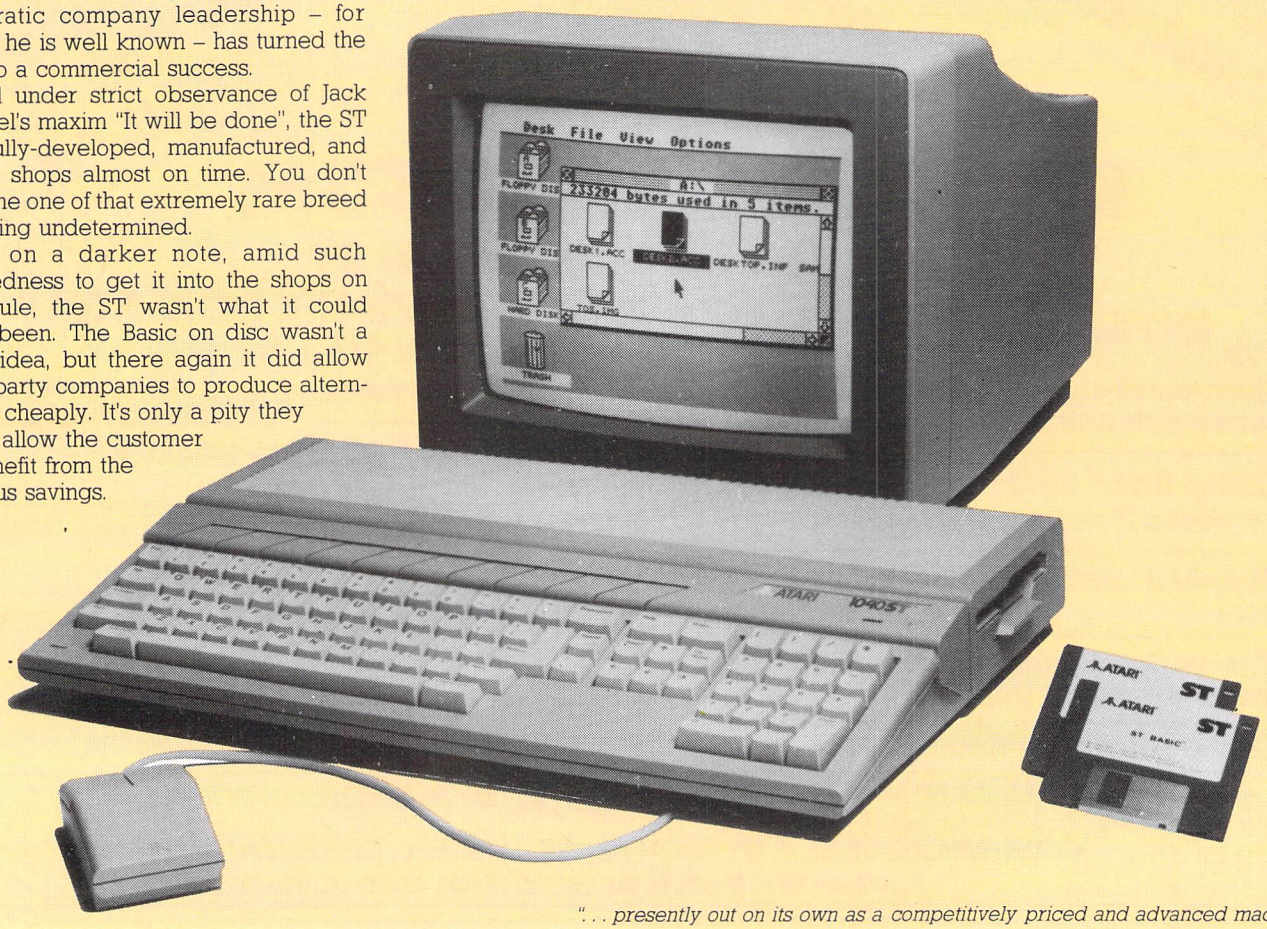
Picture this: It's 1985, a prototype ST is about to be exhibited at the Hanover Fair in West Germany. Journalists wait with word processors at the ready, and eventually report on an extremely raw design which bore little resemblance to the final product. Warning: Prototype watching can seriously damage expectations!

The real confusion began with the memory size, as initially Atari focused on a 130ST, 260ST and 520ST. I know, 130 and 260ST really don't sound right. Luckily, something unprecedented happened to change all that. At the time 256k memory chips were extremely expensive, but thanks to our friends in the Far East, coupled with the Japanese flooding the American market with memory chips costing less than their production costs – doubtless a total delight to US chip makers – 256k chips dropped to around £2.50.

Lessons to be learned

The net result was a 520ST could be built for little more than a 130ST and a lot less than a 260ST. As we now know the design was quickly revised and both the 130ST and 260ST didn't appear.

If there is a lesson to be learned here, it probably leads to the question: "Wonder how much the eventual Abaq will change?". Evidently there are many vari-



"... presently out on its own as a competitively priced and advanced machine"

ables – quite beyond the control of even the Tramiel camp – that could lead to serious re-thinking, shall we say.

The inner labyrinth

The common method of describing a computer's hardware is to state its memory capacity, the processor used and the frequency the processor runs at. That's all well and good – and informative in a concise sense – but there is a certain elegance about the ST which can be admired from afar, if not totally understood.

Its use of custom chips rather than standard off-the-shelf designs or a number of less sophisticated devices, makes its architecture one of essential economy. Following on in fact, from the mould set by Dragon would you believe – their design, though an 8 bit, was very much a pioneer.

Not wishing to be drawn into the argument "Why then did it disappear?" let's just say they were extremely competitive 8 bit times, and it was almost inevitable there would be at least one British casualty.

(The orignal BBC Micro had only one chip which could be described as a custom design, and that was a ULA or uncommitted logic gate array. It's simply a chip carrying a number of gates. What it doesn't have however, is the aluminium interconnections, so the manufacturer lays these according to customer's needs. ULAs are in fact the least expensive of custom type chips.)

Apart from containing many sophisticated chips, some of which could be described as complete systems, today's personal computer is very much a contained communications system, and the ST is no exception.

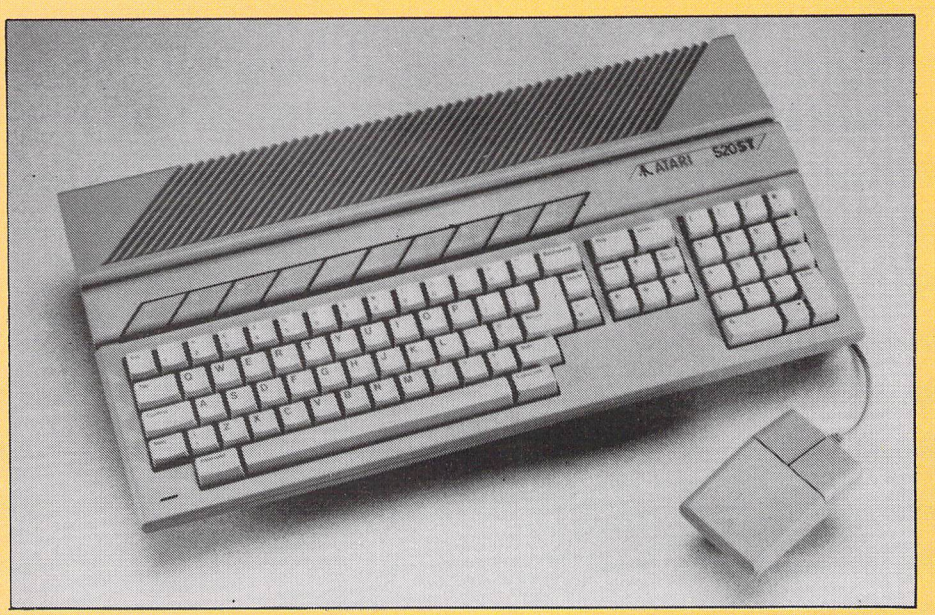
Each time a process is implemented there might be many more receive and transmit operations, not to mention the great number of handshaking and synchronising signals invoked. Writing to a chip, for example, doesn't simply involve data being streamed to it, there is the whole matter of read and write signals, timing, and so on.

Discounting the Dragon, machines usually contained a number of discrete and less sophisticated devices to carry out such tasks – the BBC Micro did. Along the same tack as the Dragon's SAM chip, Atari incorporated the GLUE, which – as its name suggests – is used to stick everything together in an centralised fashion.

A basic conflict in the design of any micro is how memory should be allocated between the processor and video. For example, how do you allow the processor to access memory as well as permit the maintenance of video operations like refreshing the screen and the like?

On some machines – like the Spectrum for one – during video outputs the processor has no access to screen memory, which results in a machine operating significantly below potential speed.

The ST however, irons out this problem admirably, using an MMU, or memory management unit, running twice as fast as the processor. The net result is the video shifter – which is simply a register for video output – can be serviced by the MMU without slowing down the processor.



". . . Atari pours a quart into a pint pot in terms of memory"

Building blocks

An overview of a computer like the ST would be incomplete without saying something about its memory organisation. The ST seems to be a member of that elite group of machines endowed with adequate memory – you rarely hear programmers say: "It's easy to fill".

But memory capacity isn't the be-all and end-all of computer design, although you might have thought so with the amount of emphasis placed upon it.

The organisation of memory is also important, particularly when it exceeds the normal capacity determined by the number of address lines on the processor. If you don't understand the inference here, just accept that in such a direct memory connection circumstance, the greater the number of address lines the more memory that can be linked.

With the ST, Atari, like so many other manufacturers, pours a quart into a pint pot, in terms of memory that is. Without getting involved with low level machine workings, the 520ST's ram is arranged in two columns of eight 256k memory chips. Just for interest's sake the 130ST would have had two columns of 64k chips and the 260ST, four columns of 64k chips.

The MMU, is simply a custom designed chip which permits the incorporation of a large amount of memory. And believe it or not, it could be used to connect up to 4Mb, rather than the comparatively meagre 520k or 1Mb you may have.

The remaining rom is arranged in 64k banks, selected using five lines from the GLUE. The method by which the lines are decoded is complex, and would be out of place here.

The GLUE does a little more than render banks of rom active however. For instance, it controls peripheral devices, and as such is very much interrupt-driven.

Interrupts, if you haven't had the pleasure, are signals generated by hardware

Turn to Page 68 ▶

The 130ST – abandoned at an early stage of development

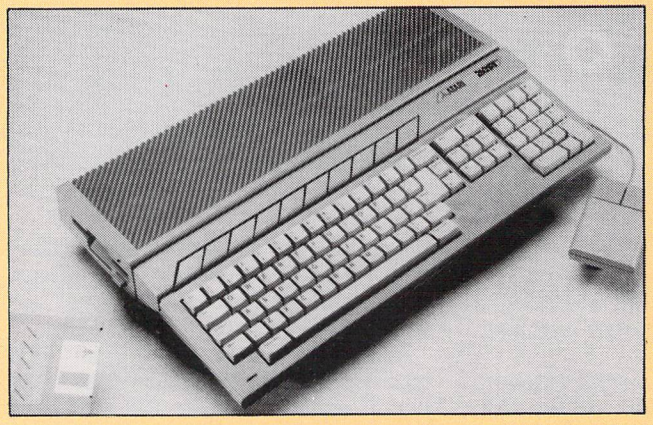
◀ *From Page 67*

devices that tell the processor to stop whatever it's doing and do something else, like perhaps attend to an input/output device. They are kind of pleas for the processor's often precious time, I suppose.

Inevitably the use of interrupts is really an effort to overcome a micro's serial nature, and as the processor can only do one thing at a time, duties have to be carried out according to priority. The chip within the ST that decides which interrupts should be observed first is the 68901. And out of many interrupt requests, the device will appropriately signal the GLUE – this is what is meant by interrupt-driven.

The 68901 is a sophisticated, as well as interesting, device. It has eight interrupt lines, and in a manner similar to the processor, can be set to respond to interrupts above a certain level and duly ignore those that fall below it.

The levels vary from 0 to 7, where each level of interrupt corresponds to particular tasks. For instance, level four interrupts serve keyboard, mouse and Midi. In comparison with the rest of the system it runs fairly slowly, at 4MHz in fact.



The 260ST, also abandoned

Fellow worshippers . . .

Now an established success, it's only natural that a machine like the ST is praised and accepted as a thoroughbred among micros. But such admiration is not simply due to popularity, like perhaps some of the 8 bit designs which in the main were intensely boring and monotonous.

The ST is, as we have seen from this brief overview, a machine of considerable virtue, and extensive work has gone into its design and development, which is evident from its use of full-custom chips that defy any off-the-shelf equivalents for compactness.

In short, it is the machine Sir Clive's QL could have been, and met the high standards that would have led many a manufacturer – in a not so comfortable a financial position – to make compromises.

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MUG THE INDEPENDENT MicroLink User Group NEWSLETTER

Through the Gateway

Gateways are connections to other computers. MicroLink has a number of these, to British, European and American databases, and one which has come in for a bit of publicity recently is the USA-based Mnematics Videotex service.

This offers similar features to MicroLink, but as it's mostly used by American subscribers it is intriguingly different in style.

But the number of MicroLink subscribers using the gateway has made an impact. The UK SIG (Special Interest Group) has passed a message on to MUG commenting on this, and asking us for our ideas and reactions to the service.

They also have online parties; a number of subscribers get on line at the same time and use the Mnematics CHAT facility to discuss anything that seems worth talking about.

So if you've ever fostered a secret ambition to invade America, this might be just the way to do it.

Linkup

Most MicroLink members – even the active ones who regularly chat, mail and use the Bulletin Board (BB) – only know their fellow MicroLinkers as names and numbers. And most subscribers have questions and suggestions about the service, judging from the enthusiastic discussions on features and performance that pepper the BB.

So how about meetings, where users can get together in convivial surroundings and perhaps get to buttonhole a MicroLink official specially imported for the occasion? That's the idea behind the Linkups.

So far, volunteers have said they'll organise Linkups in Manchester, Birmingham and London. As everything is being sorted out on the BB, dates, times and venues are extremely flexible; as things become more definite they'll be published in Mugshot. And if the Linkups are as successful as they should be, they could well turn into regular events.

For the latest details on Linkups, mail MAG95816 or check on the board.

Umbrella organisation

Starting a small business is encouraged these days, but anyone going it alone for the first time soon discovers a huge range of problems – bureaucratic, financial and practical – which can sap the energy of even the keenest start-up.

ExpertLink is a new service aimed at both new and established businesses. Run along the lines of the bulletin board, it provides access to two teams of experts, one based at the University College of Swansea and the other based just about everywhere.

The first group consists of professors and lecturers with qualifications in a wide range of subjects from law to ergonomics. The second has an even wider base of experience – the MicroLink subscribers themselves. Many of these run small (and not so small) businesses, and have solved the problems themselves.

Subscribers can either post a question for public discussion or send it for confidential consideration by the UCS team. And anyone can volunteer answers, or pass on a useful contact name, or even offer a service themselves.

Quick!

Your tortoise is on fire. What do you do? This month has seen some more unusual bulletin board entries, some of which could conceivably solve your problem.

For owners of incandescent reptiles, either the Tortoise Trust (MAG36331) which has been offering advice and leaflets on the care of the beasts or the Merseyside Fire Museum (MAG-100518), which consists of keen fire engine enthusiasts, might sort things out.

Other ideas currently under discussion on the board are chess games via Email, a poetry corner, and genealogy with computers. Someone's even trying to sell their latest music album; while MicroLink has made nobody a rock star yet there's always the first time.

More mundane matters managed to get sorted out, like how to send mail to New Zealand or how to download software to an IBM PC. It just goes to show; all you have to do is ask.

Shots in the dark

This page of news has to be prepared weeks in advance of publication – an inherent problem with such archaic technology as ink and paper.

Things change fast on MicroLink. So a weekly MicroLink User Group newsletter is published on the system itself. This can reflect what's happening faster, as well as dealing with individual problems, provoking discussions (hopefully!) and giving updates on new features.

It's called Mugshot. Written by Rupert Goodwins (MAG95816) it's posted on the Bulletin Board (>BB) in the MUG category late on Sunday evening each week.

It's also sent via MicroLink/Telecom Gold electronic mail to a list of people who would rather get a copy mailed to them than use the BB. This also means that Telecom Gold users who aren't MicroLink subscribers can see what they're missing. Again, contact MAG95816 if you fall into the latter category.

Getting carried away

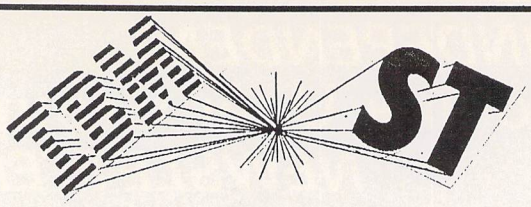
...is one of the reasons the Cambridge Computer Z88 has been so popular. A number of MicroLink subscribers either have one or are interested in the beast. And in the tradition started by Brian Vallot-Lewis' (MAG11357) Archimedes User Group, a Z88 group has started up on MicroLink.

This one's organised by Vance Burton. Everybody in the group keeps a list of all the other members, and the Email system makes it easy for anyone to send a request for help or a new discovery to everyone else.

And if nobody in the group can solve a particular problem, then as soon as Cambridge Computer comes up with the answer it can be distributed to everyone.

The Archimedes group has been doing great things since its inception. Discounts for members on a range of commercial software have been arranged, and contact made with several suppliers. It must also be the only nationwide discussion forum which is entirely free from commercial considerations; the only people making the news are the users themselves.

Suggestions of material for inclusion in the MUG Newsletter should be sent to Rupert Goodwins on MAG95816



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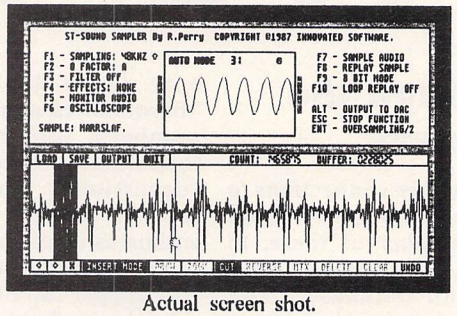

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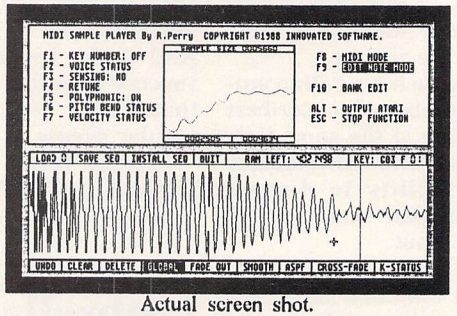

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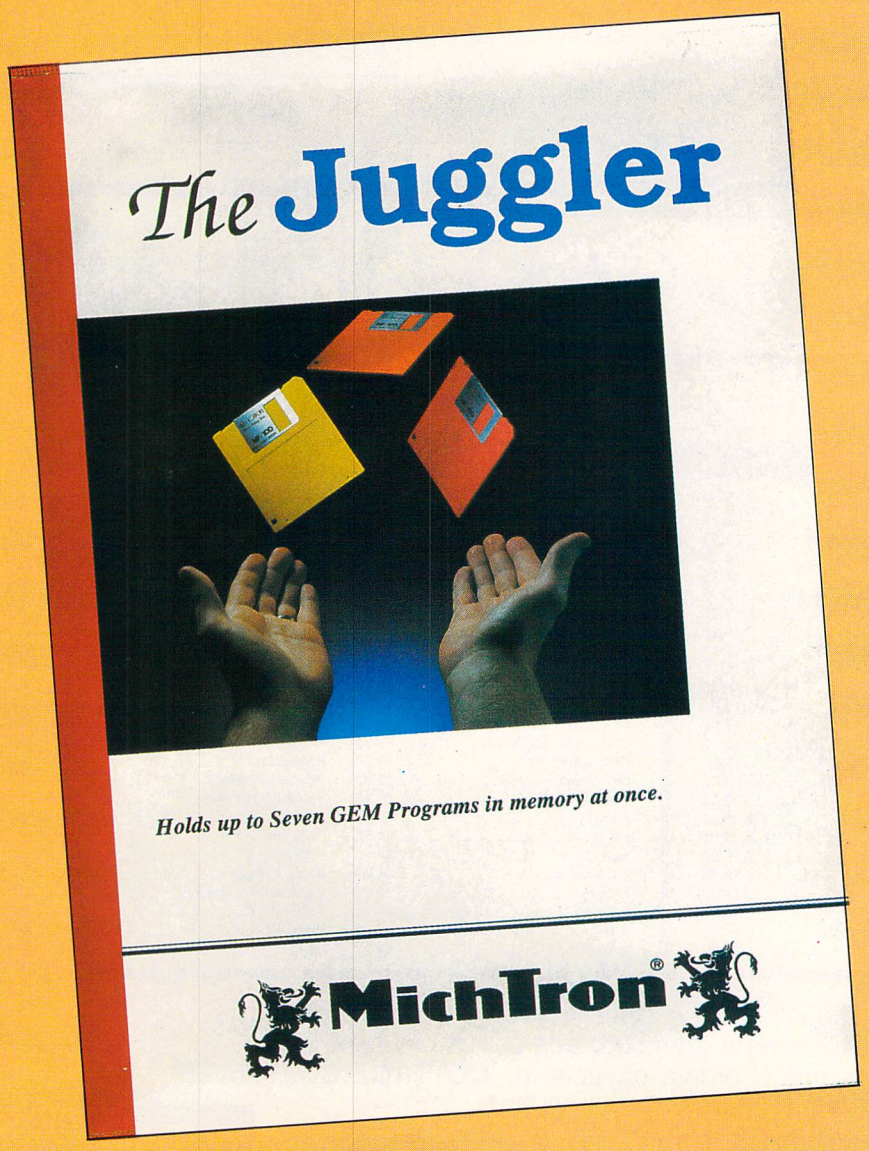
Multitasking with Gem

Need to run more than one application at a time? Try MichTron's The Juggler, reviewed here by Edgar Howard

MANY complex computing tasks mean loading one program, doing something with it, then exiting and loading a different one. This can be both time-consuming and tiresome. The Juggler is a utility which is designed to help in just that kind of situation. Put more formally, The Juggler is a utility program which allows several Gem applications to reside in memory at the same time, and makes it possible to switch between them without having to exit one program and then load another.

As an example of its use, you might have a word processing program and a database both in memory at the same time. A file could be edited using the word processor and then you could switch to the database, consult or edit a record and then switch back.



The Juggler comes on a single disc with a short, but adequate and well-produced instruction booklet. The disc is not copy protected and users are urged to make back up copies for regular use, keeping the original disc as a master.

This is a laudable move by Michtron who produce the software. It means there is no problem in installing the program on a hard disc, and indeed, there is no reason why a number of copies should not be made on different discs with various applications.

However, you are asked not to make unauthorised copies and give these to friends. The request is entirely reasonable. Copy protection is a bane, but piracy is a real threat to software houses.

Installing Juggler could hardly be simpler. Double click on JUGGLER.PRG and the screen clears to display a welcome message. This disappears and is replaced by The Juggler window. This has seven application buttons, a large load button and a close box.

Clicking on the load button brings up a Gem file selector box. The required application is selected, its name appears in The Juggler's application list and the program starts running.

To load another application it is necessary to access The Juggler window, this will bring it to the top, and load is selected again. The second application will then load and run.

This procedure can be repeated in theory as many as seven times. Gem will allow a maximum of eight windows to be open, and since The Juggler itself requires a window, seven is the maximum number of programs that can be loaded.

This would not seem to be a serious limitation. I found that juggling with three programs, one of which had two windows open, was quite enough to handle.

To switch between one application and another, just click on the appropriate window. If you are not used to having several windows open at a time, this can be disconcerting at first. Trying to remember just where a hidden window is placed on the screen isn't easy.

It must also be remembered that if one of the applications is a word processor and two document windows are needed, then only six applications should be loaded.

I preferred to use the second method of access, which is simply to click on the menu bar. This immediately brings The Juggler window to the top.

If there are a number of applications which are to be used together regularly, then pressing the save button on The Juggler window will cause the applications to be automatically loaded each time The

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Juggler is run. This option can be bypassed if the Shift key is held down while clicking on JUGGLER.PRG.

Some programs are memory hungry and will grab all the available ram in the machine. If such a program is loaded first, then trying to load a second one results in an insufficient memory message being displayed. The answer, as the instruction booklet points out, is to load the program that grabs memory last.

Using it isn't all plain sailing, and you could come across one or two problems. For instance, I wanted to modify some printer drivers for use with 1st Word Plus, so that I could use all the facilities of the FX800 printer.

This would mean loading up the printer .HEX file into 1st Word Plus, editing it, saving it, and exiting the word processor. Then it would be necessary to load and run the Install Printer program. Finally, the word processor would be re-loaded to print a trial document.

Unless the modifications to the printer file were correct first time, the whole procedure would have to be done again. It seemed just the job for Juggler.

The first snag is that 1st Word Plus uses all the available memory for documents so it has to be loaded last. The Install program automatically exits when it has produced the configuration file.

The problem was solved by loading the disc version of Fast Basic first and then loading 1st Word Plus. Next, I quitted from Fast Basic which left a chunk of memory free, usable by Install. I loaded the Hex file into 1st Word Plus, edited it and used Save and Resume.

Now it was easy. Use Juggler to load and run Install without quitting 1st Word and then install the new printer configuration and test it. If it required modification, 1st Word Plus was already running with the HEX file loaded and waiting.

The Juggler instruction booklet gives some excellent tips on writing well-behaved Gem programs. Unfortunately, not all programs are well behaved – or Gem-based for that matter – and will not run successfully from The Juggler.

This is no criticism of The Juggler, but it does, at present detract from its usefulness. The only criticism I would make is that it does produce untidy screens when it is loading a program. This could easily be solved.

A most useful improvement would be a method of reserving a section of memory so that a program such as Install could be loaded. This facility would also make it possible to run two memory hungry programs from The Juggler. At present that is not possible.

I tested The Juggler on a 1040ST with two floppy disc drives. You could use it with a single drive, though it would be less convenient. Users of 520ST machines might find themselves short of memory.

The Juggler is an innovative program. Gem is potentially a multi-tasking environment and this utility is, so far as I am aware, the first application to take advantage of that. I enjoyed using it and it saved hours of work.

FACT FILE

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Here are the final four questions in this fantastic New York competition. With the answers to these and to the four questions which appeared in Atari ST User last month, fill in the entry form and ensure that your entry arrives before July 30. The winners will be the first to be pulled from the sack.

FINAL QUESTIONS

5 On which ocean does New York stand?

6 What did the Dutch settlers name New York?

7 Which island is the core of the city?

8 What is the state capital of New York?

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Stephen Hill tries out a new package which adopts a radical new approach to writing programs using Gem

Now for something entirely different

THE first high level language ever written for the Atari ST was Digital Research's C compiler. It was designed from the outset to implement the graphics environment manager Gem, which forms the heart of the Atari ST.

Since this C compiler was only available to registered developers and not ST owners in general, a number of well known software houses such as Prospero and Metacomco rushed to fill the gap.

They produced a range of languages from C to Pascal, and inevitably all of them used the same set of Gem functions originally pioneered by Digital Research.

While this was good news if you needed to convert programs from one language to another, many people have found the standard Gem routines both unfriendly and over-complicated.

Now at long last there is an alternative. OSS has broken new ground with an expanded version of their existing Personal Pascal compiler, which embodies a unique and radically different approach to Gem programming.

The package comes on two single sided discs containing an editor, compiler, linker, and a comprehensive assortment of example programs.

As with most development systems, Personal Pascal supports a Gem-based programming environment – called the manager – which enables you to access every component of the package using one of the many onscreen menus. In addition, most of these options are also available directly from the keyboard.

Unlike Prospero's workbench, this manager doesn't incorporate an editor. In my opinion, this slows down the program development cycle considerably, especially on a standard ST.

Setup snag

Before you can use OSS Pascal, you first need to customise the manager to your ST's configuration. This is done by calling the Locate programs option from one of the menus, and informing the system where it should look for the various parts of the package. Although this should have been perfectly straightforward, in practice I found some setups simply didn't work.

The worst offender in this respect was the editor, which expected to find its resource file in the same directory as the manager. Despite being documented in one of the files, this is still a major annoyance, especially for people using a ram disc.

After you've successfully completed this procedure, you can now save all the current settings into a PASCAL.INF file, which will be loaded automatically whenever the manager is executed.

Spread the load

One particularly useful feature was the Copy command. This allows you to copy files from one drive to another straight from the manager. Anyone restricted to a single drive would therefore find it very easy to spread the development system between several different discs.

Furthermore, with clever use of the locate option described earlier you can arrange for any disc changes to be prompted for, as and when required.

The editor supplied with this package looks very different to the equivalent program found in most other programming languages. Instead of using the standard Gem windows, OSS started from scratch and produced something refreshingly innovative.

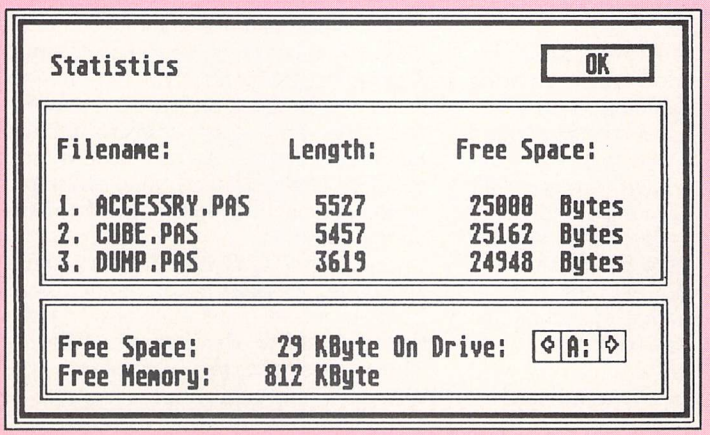
By completely eliminating most of the normal windowing operations, OSS has managed to retain all the power of a normal Gem-based editor while at the same time removing a lot of clutter from the screen. As a pleasant side effect, there has also been a noticeable speed improvement in comparison with more conventional systems.

All the usual editing facilities have been implemented, including auto-indent, search and replace, and a useful set of cut and paste commands. These operations perform extremely quickly, and the screen scrolling is also delightfully smooth.

It's possible to edit up to three files in memory simultaneously, although only one of these can be displayed on the screen at a time. Another welcome option was the ability to execute the compiler and the linker straight from the editor. This was less useful than it might have been, because the editor needed to be reloaded again after the compilation was completed.

The compiler itself is extremely powerful and has a number of extensions, such as an OTHERWISE clause for the CASE statement, and a wide variety of

Turn to Page 80 ▶



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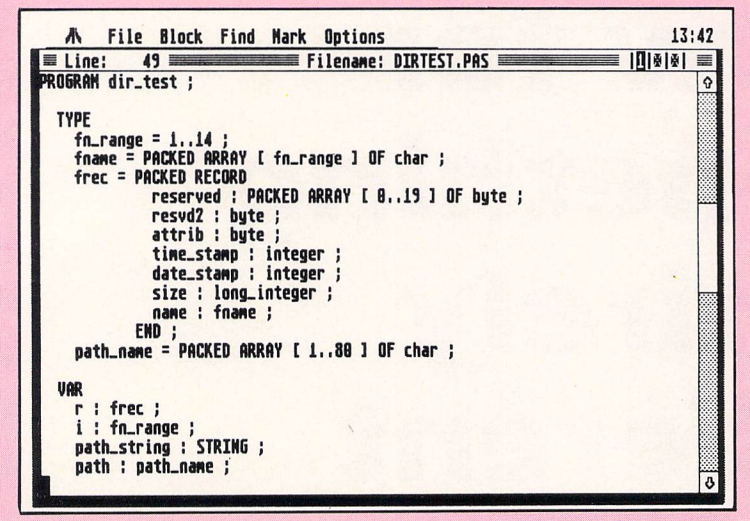

Using the editor to enter a program

◀ *From Page 79*

impressive string manipulation routines. It also incorporates a crude but usable form off segmentation.

One limitation with this system is that it is only capable of generating files in a unique OSS format. You can, however, use the linker supplied with the system to allow you to combine any externally compiled modules with those produced by Personal Pascal, providing they are compatible with the standard Tos linker.

Simplification

Support for Gem is truly excellent. OSS has rewritten the normal set of Gem bindings, completely. A concerted attempt has been made to simplify the process of writing Gem programs in Pascal as much as possible.

The approach is typified by the GEM_INIT function, which single-handedly replaces all of the complicated Gem initialisation procedures such as opening a virtual screen workstation and setting up the graphic handle.

Similarly, a useful library of high level functions is provided to enable you to effortlessly manipulate windows and dialogues. Whenever possible OSS has given these functions sensible names such as *draw_string*.

In addition, OSS made simple the creation of your own desktop accessories by including a special compiler option.

You may think all this sounds slightly too good to be true, and you would be right. The price you have to pay for all this user friendliness is compatibility with other systems. If you are already familiar with the standard Gem programmming model you may well be unwilling to relearn a whole new set of techniques before you can use this package.

Furthermore, if you have already written Gem-based programs using another Pascal compiler, you will inevitably get a severe headache when you try to convert these routines into Personal Pascal.

If the Gem programming environment is wonderful, then the Tos facilities are rather disappointing. The only concession to people who wish to access the ST's operating system directly are three instructions: BIOS, XBIOS and GEMDOS.

This compares badly to the extensive support given by Prospero to these functions. If you really need to use Tos a great deal you can, however, buy a separate library of routines called Tacklebox. This costs $69 in the US, which may well translate to £70 when it finally becomes available in this country.

The linker used by this system is apparently less than 5k long. Unfortunately the reason for this amazing compactness is that many of the more advanced features found in the larger programs have been sacrificed.

As the only linker formats this package supports are the Tos and OSS systems, this means it is therefore currently incompatible with a number of popular programming languages.

Ironically, among these is HiSoft's own Devpac, which is unable to generate linker files in the correct format. HiSoft promises that a program will be available soon to convert between GST and Tos files, and this will hopefully solve the problem.

OSS supplied the documentation in the form of a large paperback manual. Although the writing style is rather too American for my taste, it is still extremely readable and very comprehensive. Because Personal Pascal uses a non-standard Gem interface, you have to rely on the manual completely for information on this subject.

Fortunately OSS has devoted almost 200 pages to Gem programming alone. Every topic you could think of is covered, from menus to desktop accessories. These sections are peppered with examples, and there's an exhaustive set of demonstration programs on the discs to get you started.

Furthermore, OSS has placed a large disc of programs in the public domain which should already be available from your local software library.

The manual is more than just a reference work, it is a Gem programming tutorial. It compares very well in terms of quality with the documentation provided by Prospero, and that is high praise indeed. One feature I particularly liked was the Notes and Cautions appendix at the back, which gave a number of helpful hints to the budding Pascal programmer.

Powerful

OSS Personal Pascal is an exceptionally powerful development system which will be welcomed by a whole army of frustrated Gem programmers. It is not particularly suitable for use in conjunction with other programming languages, so if mixed language programming is an important requirement, you would almost certainly be better off looking elsewhere.

Unlike most of its competitors, Personal Pascal does not include any form of debugging aid, which may be a serious disadvantage to many potential buyers. Having said that, the quality of a development system has to be determined by the quality of the programs produced with it.

I've already seen an impressive Lisp interpreter (reviewed elsewhere in this issue) written in an earlier version of this package, and I expect to see many more programs created using Personal Pascal in the future.

In my opinion the Gem programming facilities provided by this system are better than anything currently on the market. They may seem fairly alien at first, but in terms of user friendliness they leave most of the competition standing.

If you want to write programs using Gem, and wish to try something a little different, Personal Pascal could well be ideal.

FACT FILE

Product: Personal Pascal
Price: £79.95
Supplier: HiSoft, The Old School, Greenfield, Bedford MK45 5DE.
Tel: 0525 718181

POINTS FOR:
Very easy access to Gem. Good manual.

AGAINST:
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COMPETITORS REVIEWED:
Metacomco Pascal – December 1987.

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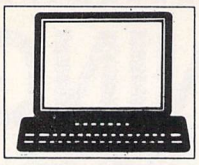

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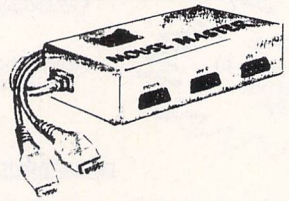

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Going dotty or daisy?

Bruce Smith reviews a range of quality dot matrix and daisywheel printers

PRINTERS are probably the source of more confusion and controversy among computer users than any other add-on you care to name.

For most ST users they are also probably one of the first major hardware peripherals bought, so making the right choice is vital, especially as the range is so wide.

There are a few rules you can follow and this guide, along with a review of some of the new range of Panasonic printers, should help you decide wisely.

Printers are classified by the way in which they form characters on paper, and this is controlled by the printing head mechanism. The most popular is the dot matrix, followed by the daisywheel.

The types

The dot matrix print head consists of a vertical bar of nine pins that hammer out dots on to paper through an inked ribbon. Characters are formed by using combinations of pins across the paper.

Because the pins can be turned on and off in an almost inexhaustible set of combinations, many special effects are possible. For instance, when printing text, by printing the top four or five pins a fraction later than the bottom four or five, characters can be slanted giving you italics.

Selecting the Print Screen option from the desktop options menu allows you to dump a copy of the current screen image to the printer. You can press Alternate+Help to get the same effect.

An important feature of dot matrix printers is that the models produced in the last 18 months or so have a near letter quality (NLQ) mode of operation. By the nature of the dot matrix printer's operation text will often look dotty when printed and be of an inferior quality to that of a typewriter.

In NLQ mode the printer endeavours to fill in the gaps between the dots to give a smoother and more acceptable print for letters.

The final and perhaps most important consideration when it comes to dot matrix printers can be summed up in two words: Epson compatibility. The Epson dot matrix printer has become the world standard, albeit unofficially.

Every program you are ever likely to buy or enter that requires or uses a printer will support the Epson standard. This doesn't mean you have to buy an Epson printer – far from it, just make sure it's Epson-compatible.

Top quality 24 pin printers are dot matrix, but instead of nine pins they have two vertical rows of 12 pins close together. This allows many more dots to be crammed into each character in one pass of the print head across the paper. The result is text that is of a better quality than NLQ dot matrix, and virtually indistinguishable from a daisywheel machine.

Daisywheel printers are effectively computer driven golfball typewriters. The output quality is very good, so for text-only applications this type is first rate.

The disadvantage is that a wheel of characters must be fitted to the print head, so the printer is limited to using the character set you have installed. A variety of wheels can be obtained, but changing them during printing is not really practical.

Prices for these printers start at about £300 and the Diablo standard is the one to plump for.

There are two ways in which a printer can be connected – serial and parallel, the latter also referred to as Centronics.

The ST has a parallel printer port located on the back of the case so it is best to buy a printer fitted with a parallel interface.

You will also need a lead to connect the two together, and any dealer will be able to supply one. It is possible to connect a serial printer via the modem port if you so desire.

The speed at which a printer operates is measured in characters per second (cps). The printer should be capable of at least 100 cps, and ideally more.

Another factor that affects printing speed is the size of the ram buffer which holds information to be printed. A largish buffer of 4k or more is best. A small one means the computer is held up, and can only send the information across in dribs and drabs. A good size is 8k, though 1k is common, and just manageable.

The desktop Desk menu contains an Install Printer option which allows you to define the type of printer you are to use. For a dot matrix the default values are those required. The ST manual contains further details on these settings.

The printers

Panasonic KX-P1081/1082: The first thing that strikes you about this machine is its size. Its footprint – that's the amount of desk space it occupies – is just under 16 inches by 11 inches, and at 4.5 inches high it will remain unobtrusive.

The printer is a nine-pin dot matrix which is fully Epson and IBM compatible. Located in the top panel are three recesses containing various switches – tractor/friction feed selector, on line/form feed and line feed buttons, and lastly a mode selector button which allows NLQ and compressed print to be selected as standard.

Five basic printing pitches are available – standard pica (10 cps), elite (12

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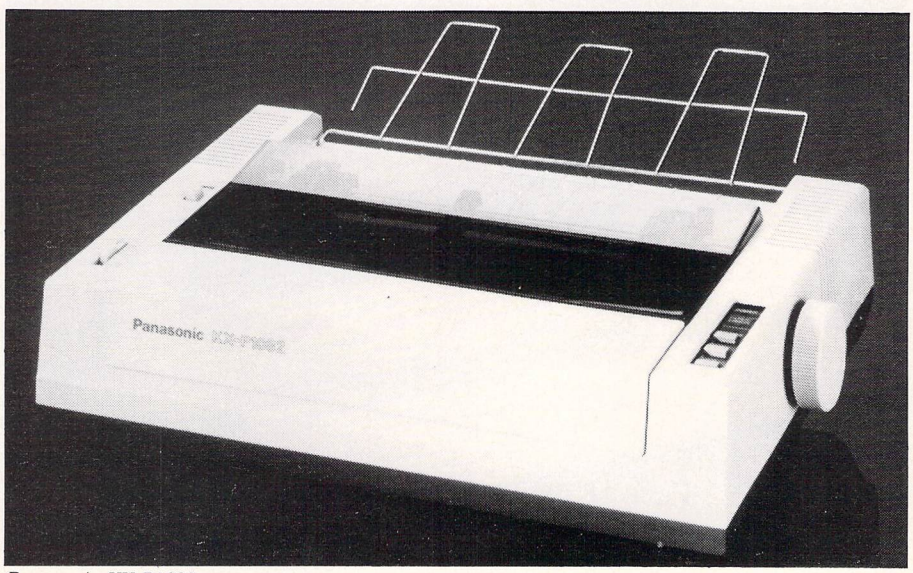


Panasonic KX-P1082

◀ *From Page 83*

cps), compressed (17 cps), semi-compressed (15 cps), and proportional spacing. The standard printing speed is quoted at 120 characters per second, and a rather small 1k print buffer is fitted.

In addition to Epson and IBM control codes, several extras worth mentioning are available. The italic character set can be made to print international characters in standard print mode when Ascii codes 128 to 159 and 255 are sent to the printer.

There's a print selection mode. Most printers allow you to combine various effects, for example double width and emphasised elite, but to do this would normally require three sets of control codes to be sent – one set for each.

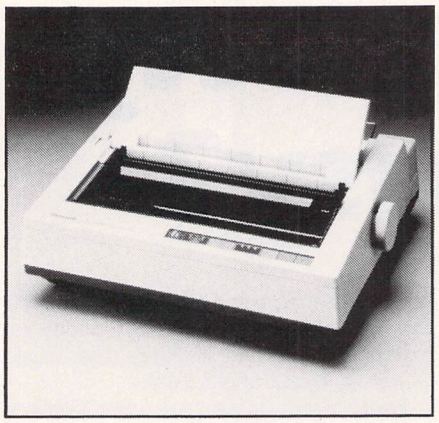
By using the print selection mode the whole lot can be produced by sending a single three-number code, the last number defining the effects to be switched on, of which there are 64 different combinations.

The NLQ offered by the KX-P1081 is well formed and may be printed in pica or elite pitch mode, and may also be in italic.

Standard, double and quad density graphics are available, plus 640 dot, 576 dot and 720 dot density modes. The 576 dot density mode is particularly interesting as it provides a 1:1 printing ratio which should enable the printer to be used to print proportional screen dumps.

Most of the screen dumps throughout *Atari ST User* are printed using the KX-P1081, so take a look at them to see what the print quality is like.

KX-P1083: Like the KX-1081 this is a nine-pin dot matrix printer but is slightly larger all round and somewhat heavier. Touch buttons occupy one side of the top front facia through which NLQ, pica, elite, compressed and proportional print



Panasonic KX-P1083

modes may be selected. An interesting feature is a small dial switch which can be turned to set the form length of paper from 3 to 12 inches.

The K1083 is fast – 240 characters per second in draft mode – and has a more acceptable 6k print buffer which can be expanded to 38k – ideal for printing long documents.

The KX-P1083 has all the special effects that the KX-1081 offers plus a few more. Interestingly, and this is the first time I've seen it on a printer, super and subscript can be printed in NLQ. There are 80 selectable effect combinations in Print Selection mode.

KX-P3131: This is a 110-column daisywheel printer, somewhat larger and heavier than the P1081, but at 19 inches wide by 13 inches deep it is still desk-sized.

It's always odd using a daisywheel printer after a dot matrix because of the speed difference. At 17 cps the P3131 is not particularly fast, but its print quality is very acceptable.

A Courier 10 daisywheel is supplied with the printer, and this is compatible with the Diablo 630 series daisywheel which is a sort of unofficial standard in the world of such machines. At the top front of the printer are four unobtrusive slider switches to the left, and three touch switches to the right. The right ones control online, form feed and line feed.

The first switch on the left, margin control, has three settings plus normal. The LM and RM settings allow the left and right carriage margins to be set and JUST will justify text between these margins.

The pitch selector switch allows the character pitch to be set to 10 cps (pica), 12 cps (elite), 15 cps and proportional. In a similar fashion line spacing can be pre-set to 1/6, 1/4 and 1/3 by using the line spacing switch.

Finally comes the impression switch, which allows three densities of printing to be set – light, medium and heavy. Surprisingly enough the printer has a graphics mode. It is rather limited, but effective graphs can be built up.

A special program mode allows non-standard print wheels to be used with characters being accessed through their spoke position on the print wheel.

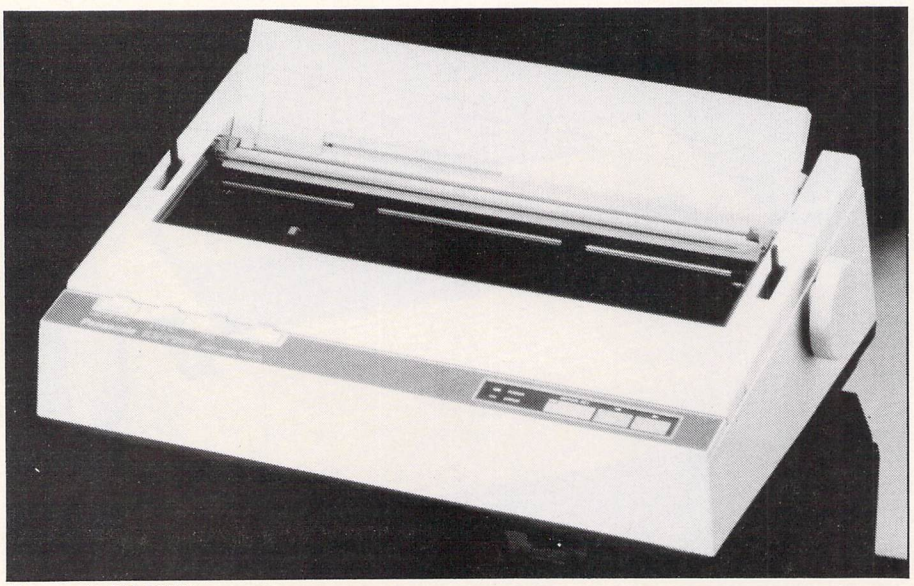
Summary

The three printers come with the standard bells and whistles expected of the modern machines. Centronics parallel interfaces are fitted as standard. Overheat, paper out and cover open detectors are also there.

All have much to offer, in particular the KX-P1081 which at under £200 (shop around) has to be one of the best all-round budget printers.

The KX-P1083 is fast, especially in the normally slow NLQ mode, and robust, but overall slightly disappointing in terms of facilities offered. Nevertheless the print quality is excellent, and the wide range of control codes, particularly in print selection mode, make it easy to use within any application.

The KX-P3131 is a sturdy designer daisywheel printer and its ability to accept a wide range of print wheels ensures acceptance, and makes it a very good buy.



Panasonic KX-P3131

FACT FILE

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Plotting to get things moving

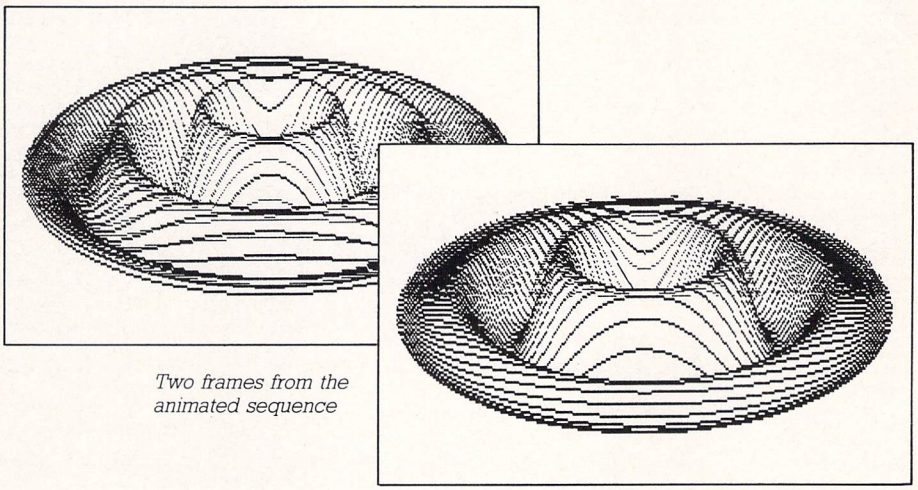
David Maw presents an animated 3D picture written in GFA Basic

LOOKING over some old notes of things to try out I came across one which suggested "Draw 3D plot and page flip". At that time I had an Atari 400 with 32k of memory, and was just learning about page flipping. However, flipping between three or four high resolution screens was not going to give me much animation, so I had let the idea drop.

At this point I remembered the GFA Basic demonstration of an animated horse galloping across the screen. This program shows how to load the pictures from disc, but not how to save them in the first place.

The saving and loading has to be done just right or you get garbage or nothing at all on the screen – as I found out when I tried it. The two programs here show the final results of my experiments.

Program I draws a series of 3D graphs – looking rather like the ripples produced when a stone is thrown into a pond – and saves them to disc. Program II will load these graphs and rapidly display them in sequence, producing an animated picture. The illustrations show two of the frames.



Two frames from the animated sequence

The following statement in the procedure *Storage* gets the area of screen defined by the top left and bottom right coordinates and stores it in the string *A$*:

```
Get 158,100/Res,477,300/Res,A$
```

Strings are limited in size to a maximum of 32k, which means that if the whole screen has been defined it will just fit into the string (if you want to save the whole screen the Sget command is faster and the coordinates don't have to be specified).

On a 520ST you can fit eight full screen strings in memory at once, but this still does not make very impressive animation. However, this can be rectified by storing only a portion of the screen for the animation.

Program I uses a section of the screen to draw a 3D plot and this allows many more pictures to be held in memory at once. If smaller pictures, or small parts of a larger picture, are used, a much longer animation sequence could be created.

The length of *A$* is found and *Mki$* is used to turn the number into a character string, so it can be stored along with the picture by Program I. This is necessary because when *Input$* is used to load the pictures in Program II the length of the string must be known.

Program II loads in the data file created by Program I, separates it into individual pictures stored in strings and then displays them in sequence. The data is loaded with:

```
A$(T)=Input$(Cvi(Input$(2,#1),#1)
```

Input$(2,#1) loads the the picture length string, which *Cvi* converts back into a number so the picture itself can be loaded. Two end of record characters put in by the:

```
Print #1,B$
```

statement when the pictures were saved to disc by Program I are removed with:

```
Dummy$=Input$(2,#1)
```

The statement:

```
Put 161,100/Res,A$(T)
```

puts the picture held in *A$(T)* on to the screen with the top left coordinate of 161,100/*Res*. An extra parameter can be added to the statement to change the mode with which the picture is displayed. Try adding 12 after *A$(T)* and the same with the other Put statements.

Program I takes just over 40 minutes to run in high resolution and 20 minutes in medium, but it is only needed once. Program II can be used repeatedly to show off the results.

If you are interested, try out another 3D plot with the line:

```
F=(S-1)*Sin(S*Ch)
```

in the procedure *Doplot* of Program I replaced with:

```
F=Cos(Ch*S)*(1-S)/2
```

Don't forget to change the names of the data files in the Open statements or the original data file will get overwritten.

Not much good for the animation, but still interesting are:

```
F=Exp(Cos(Ch*S)
F=Sin(S*Ch)
F=(Ch-S)/4
```

which tend to oscillate up and down the screen. This method of producing animation is clearly not too difficult to use and can readily be adapted for other needs.

Program I

```
Rem 3D Plot
Rem By David Maw
Rem (c) Atari ST User
Rem Written in GFA Basic
Clear
Resolution=Xbios(4)
If Resolution=0
Alert 3," Please use High-res Monitor
 | or Medium-res Colour ",1," end ",Q
End
Endif
Res=1
If Resolution=1
Res=2
Open "o",#1,"plot_3dm.dat"
Else
Open "o",#1,"plot_3dh.dat"
Endif
```

Turn to Page 88 ▶

◀ *From Page 87*

```
Cls
H=315
V=100
D1=H/2
D2=D1*D1
E1=V/2
E2=V/4
For Ch=1 To 32
Cls
Gosub Doplot
Gosub Storage
Next Ch
Close #1
End
Rem **** Plot 3D Picture ****
Procedure Doplot
For D=0 To D1
D4=D*D
M=-E1
A=Sqr(D2-D4)
For I=-A To A Step 3*Res
S=Sqr(D4+I*I)/D1
Rem Next line can be substituted
F=(S-1)*Sin(S*Ch)
E=I/5+F*E2
If E<=M Then
Goto Bypass
Endif
M=E
E=E1+E
X=D1-D+160
Y=276-((3*E)-75)
Plot X,Y/Res
X=D1+D+160
Plot X,Y/Res
Bypass:
Next I
Next D
Return
Rem ******************************
Procedure Storage
Rem Get the picture into a string
Get 158,100/Res,477,300/Res,A$
Rem Get the length of the string
L$=Mki$(Len(A$))
B$=L$+A$
Print #1,B$
Clr B$
Return
```

Program II

```
Rem 3D Animator
Rem By David Maw
Rem (c) Atari ST User
Rem written in GFA Basic
Resolution=Xbios(4)
If Resolution=0
Alert 3," Please use High-res Monitor
 | or Medium-res Colour ",1," end ",Q
End
Endif
Res=1
If Resolution=1
Res=2
Open "i",#1,"plot_3dm.dat"
Else
Open "i",#1,"plot_3dh.dat"
Endif
Print "Please wait.....";
Print "Loading data from disk."
Dim A$(3),B$(3),C$(3),D$(3)
Dim E$(3),F$(3),G$(3),H$(3)
For T=0 To 3
A$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
B$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
C$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
D$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
E$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
F$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
G$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
H$(T)=Input$(Cvi(Input$(2,#1)),#1)
Dummy$=Input$(2,#1)
Next T
Close #1
Rem **********************************
Rem Change the value of P
Rem to speed up or slow the animation
P=2
Rem **********************************
Cls
Cycle:
For T=0 To 3
Put 161,100/Res,A$(T)
Pause P
Put 161,100/Res,B$(T)
Pause P
Put 161,100/Res,C$(T)
Pause P
Put 161,100/Res,D$(T)
Pause P
Put 161,100/Res,E$(T)
Pause P
Put 161,100/Res,F$(T)
Pause P
Put 161,100/Res,G$(T)
Pause P
Put 161,100/Res,H$(T)
Pause P
Next T
For T=3 Downto 0
Put 161,100/Res,H$(T)
Pause P
Put 161,100/Res,G$(T)
Pause P
Put 161,100/Res,F$(T)
Pause P
Put 161,100/Res,E$(T)
Pause P
Put 161,100/Res,D$(T)
Pause P
Put 161,100/Res,C$(T)
Pause P
Put 161,100/Res,B$(T)
Pause P
Put 161,100/Res,A$(T)
Pause P
Next T
Goto Cycle
```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Design your own expert software

Intelligent software is currently in vogue. Bruce Smith teaches K-Expert a thing or two and finds it a very stimulating experience

THE computer marketplace regularly goes through phases, with certain subject areas becoming the "in" thing. While desktop publishing fills the graphical needs for many, the more academically minded have been getting their vogue fix from expert systems.

For the uninitiated, an expert system can mean many things, but in essence it is the logical extension of artificial intelligence, AI. It provides software that, prearmed with a series of questions it can ask of you, will hopefully come up with the right answer.

Already such systems are making an impact in the larger teaching hospitals where interns can seek assistance in making diagnoses. Of course, such systems have to be written, and K-Expert is a rather interesting package from Kuma which provides an expert system programming language.

You type in your program, compile it, and then it can be run. The software is supplied on a single disc and so will work quite happily on any ST configuration.

The system uses both the standard approaches to problem solving, namely forward and backward chaining. The former being a recursive system and the latter a "use what information we already have" method.

Like most expert systems, K-Expert is rule based, and a program is written by using these rules to ask questions and act upon the answers supplied by the user. In addition to rules, programs also consist of variables, forms and reports.

Programs are written using the text editor supplied as part of the product, running under Gem. However, compiled files can't be run directly from the desktop. Variables are used in the traditional way to hold information in the form of alphanumeric and numeric values.

Option and confidence variables are also implemented, and these can hold results and certainly factors measured numerically on a scale of zero to 100.

Forms contain information which is known before running the program. These could be considered a direct equivalent to Basic's data statement.

Finally, reports are used to gather information as the program is running, so any conclusions reached during use can be recalled. But for the majority, programs will be constructed from two basic types of rules.

The query rules are comparable to Basic's input command, in that they are used to prompt for and get information from the user. Solve rules link Query rules together to provide a structured procedural type language.

Because expert system programs have to make informed guesses based on probability factors each rule has a certainty factor assigned it by the programmer.

Writing programs is made easy by a useful program editor which features an extensive range of editing facilities, some of which are on function keys.

In addition to the desk menu four other pop-down menus provide access to various options. Disappointingly, the software is supplied with just a single example – the famous "guess the animal" game.

While the compiled program worked fine, the source seemed to contain a number of items that the compiler wasn't happy with and so would not compile.

Compilation is set in motion from a menu, and the time taken will depend on the length of the program. It includes full error checking, and if a problem is encountered a suitable message is displayed in a status line, with the cursor resting at the point the error was encountered.

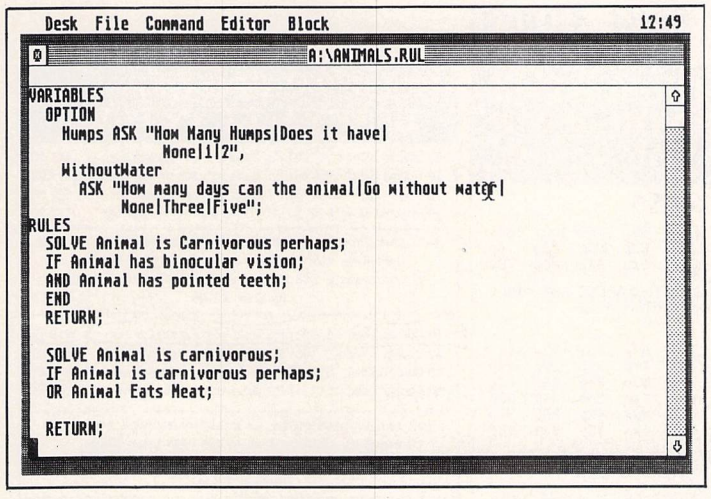
When a compiled source file is run a bar is displayed across the screen with a number of buttons from which choices to answers, which are prompted in turn, are made. The options are listed below the bar if the question is multiple choice.

In addition to the obvious Yes/No buttons, a Why button is also available so you can avail yourself of the reasoning behind the question. Similarly, when K-Expert has provided you with a final answer, the Investigate button allows you to see the reasoning behind the choice.

I found this particularly useful when developing programs which didn't come up with the right answer, as it showed where logical errors of deduction had been made.

Overall, K-Expert is a very interesting product and for anybody who has an interest in expert systems or who is looking for a new area to investigate or tinker with, they will find it most stimulating.

That said, the product is badly let down by incomplete documentation and worked examples.



The example expert system supplied with the software

FACT FILE

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AGAINST:
Documentation could be better. More examples needed.

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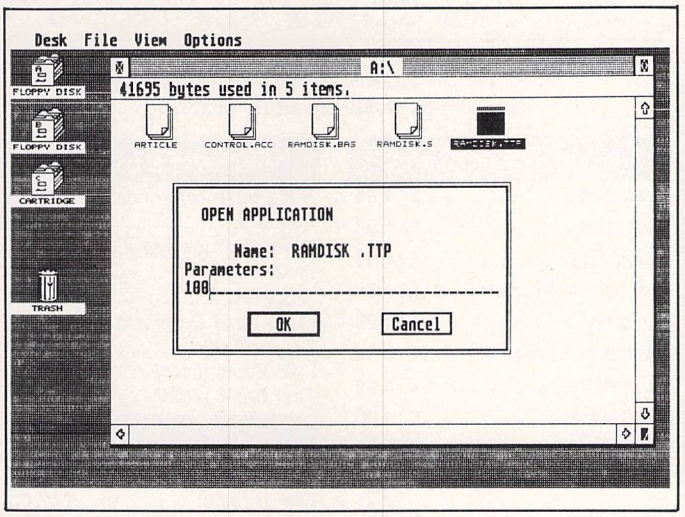
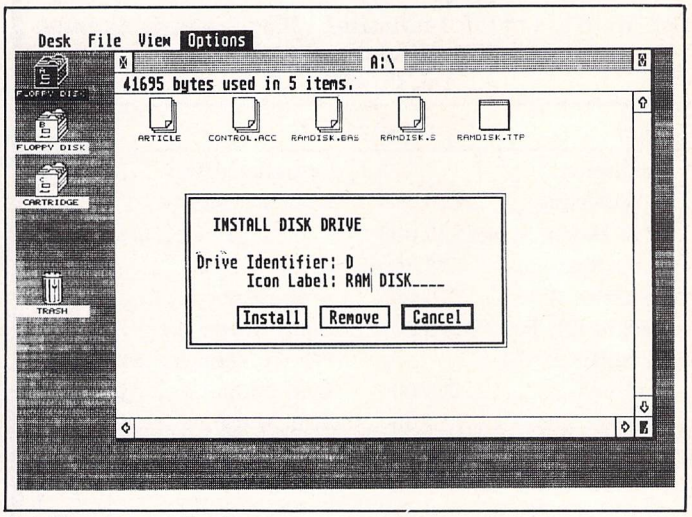


Setting up the ram disc



Installing the ram disc icon

Fancy a free disc drive?

Speed up your ST with this ram disc utility by Richard Phillips

THE ST's disc system can at times be very annoying. For instance, copying files on a single drive system requires much disc swapping – even for a single file – and accessing a disc can be tediously slow. The utility presented here is designed to overcome these difficulties by installing a ram disc.

The advantage lies in its great speed – it is many times faster than a floppy disc – and it can be used in exactly the same manner as an external drive as all software will recognise and use it as if it were a real one.

And of course, it costs nothing at all.

The disadvantage is that all the files and data stored on the ram disc will be lost when you switch the micro off, or crash it due to a programming error. It's left to you to ensure that the contents of the ram disc are saved to a floppy regularly, especially before carrying out anything potentially dangerous – like testing the latest version of your machine code masterpiece.

Getting started

You'll see that there are two listings. Both programs produce the same result, but are written in different languages, so you have a choice of which one to enter. The first is in assembly language, for which you'll need an assembler – I used HiSoft's Devpac – and the second is in ST Basic. Use whichever one you want, as the end result is the same.

Either assemble the first listing or run the Basic program to create a file called RAMDISC.TTP on floppy disc. Before you can use the ram disc you must install it, otherwise Gem won't know it's there.

To do this, double click on it from the desktop and enter the size of disc in 1k blocks in the dialogue box – 100 would be a 100k ram disc. Now click once on the drive A icon and select the Install disc drive item on the last menu. Enter D for the drive and RAM DISC for the name and click on Install. The ram disc is now ready to use.

Note that if you make it too big there may not be enough free memory left to run any programs. It all depends on how much memory you've got in the first place, and how much memory a particular program requires to run. Try a 500k ram disc on a 1040ST, or a 100k ram disc on a 520ST.

Quite a sizeable chunk of the machine code is the same or similar to that used in the printer buffer utility published in the January 1988 issue of *Atari ST User*. Most of the initialisation code is the same with the exception of the re-vectoring of the various Tos variables. Also the *buf_flg* has been renamed *disk_flg*.

As the initialisation code has been explained before, I won't go into this again; instead I'll concentrate on how the actual ram disc code works.

Gemdos views any type of media as a contiguous block of sectors and the Bios decides what type of media a particular device is, and deals with it accordingly. In the case of a floppy disc the appropriate routines in the Bios are used to access it, and in the case of a rom cartridge the Bios just transfers the code to the main memory of the ST.

If a disc has been selected that the Bios does not know how to deal with, it jumps through three hard disc vectors. These are:

- HDV_BPB – used to obtain a structure which contains data about a device, that is, how large it is.
- HDV_RW – accessed when a read or write operation has to be carried out on an unrecognised device.
- HDV_MEDIACH – accessed when Gemdos wants to know whether or not a device has changed media.

The Bios doesn't know whether a hard disc is connected or not, which is why you can substitute a ram disc instead. In simple terms, a ram disc emulates a hard disc drive.

Program details

The first subroutine of interest in the listing is *set_disk*. This uses the XBios routine *Protobt* to initialise the first logical sector of the ram disc memory. The set-up chosen is non-executable and single sided.

Once this XBios routine has been executed the number of sectors that are required for the ram disc (the size requested from the command line, plus 9k for Tos, all divided by 1024) is inserted into the appropriate place in the ram disc memory.

This is stored in Intel 8086 format – low byte first, followed by high byte – as this is a Gemdos requirement in order to retain some compatibility with MSdos format discs. After the number of sectors has been set up, the number of data clusters has to be inserted in the correct place in the Bios parameter block (BPB).

The subroutine *set-vec* just re-vectors the three Bios hard disc vectors that have to be intercepted – HDV_BPB, HDV_RW

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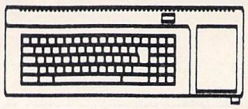

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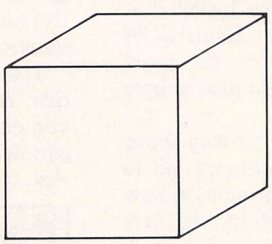

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and HDV_MEDIACH. The *new_bpb* subroutine will return the BPB of the ram disc if drive D has been selected. Otherwise it will call the old BPB handler.

The subroutine *new_rw* needs some explanation as it has to carry out some very esoteric functions. As in the previous function, the subroutine will pass control on to the previous Bios handler if drive D is not selected.

The first function that has to be performed is that the number of the first logical sector to be read or written is pulled off the parameter stack.

This is then multiplied by 512 to get an offset in bytes into the ram disc memory (a sector is 512 bytes long). This is then added to the base address of the ram disc memory in order to produce a starting address for the loop that will ultimately read or write the data block.

The buffer address for the data is pulled off the parameter stack and passed to a register for later use. The number of sectors required to transfer is also pulled from the stack and is used as a counter in register D1.

If you want to write data to the ram disc the two pointers to the appropriate data areas are swapped in order that the data flows in the right direction. This coding method is used so only one transfer routine is needed, instead of having two separate methods of reading and writing data.

The data is transferred in four-byte blocks at a time to achieve a fast execution time. Once the data has been transferred, D0 is cleared to indicate a successful operation.

The routine *new_mdch* will return a result indicating that the media has not changed if drive D is selected – the ram disc media can't be changed.

The code is quite heavily commented so you shouldn't experience too much difficulty deciphering it. It's complicated, but it is also a good example of how to write this sort of application.

```
*************************
* Atari ST Safe Ramdisc *
*  By Richard Phillips  *
*   (c) Atari ST User   *
*************************

* Equate constants

* GEMDOS functions used
term     equ  0        terminate program
conin    equ  7        fetch character from keyboard
prntln   equ  9        print a line of text to the screen
k_proces equ  $31      terminate and stay resident
malloc   equ  $48      allocate memory
setblock equ  $4a      release unwanted memory

* XBIOS routines used
protobt  equ  18       prototype boot sector
supexec  equ  38       execute routine in supervisor mode

* TOS variables used
hdv_bpb  equ  $472     vector for BPB handler
hdv_rw   equ  $476     vector for R/W handler
mediach  equ  $47e     vector for media change handler
drvbits  equ  $4c2     BIOS logical disc status variable

* Initialisation routine
ramdisk
  move.l 4(sp),a6          store the base page pointer
  pea    banner            push address of string on stack
  move.w #prntln,-(sp)     push number of GEMDOS routine
  trap   #1                to be called, then call GEMDOS
  addq.l #6,sp             adjust the stack
  pea    init
  move.w #supexec,-(sp)    execute initialisation routine
  trap   #14               in supervisor mode
  addq.l #6,sp
  tst.w  disk_flg          any errors occurred?
  bpl    no_err            if not indicate so
  pea    err_str           print a message to indicate
  move.w #prntln,-(sp)     that an error has occurred
  trap   #1
  addq.l #6,sp
  bra    exit              quit
no_err
  bsr    prnt_sz           print size of ramdisc installed
  pea    success
  move.w #prntln,-(sp)     print message to indicate
  trap   #1                successful initialisation
  addq.l #6,sp
exit
  pea    exit_str          print a message to encourage
  move.w #prntln,-(sp)     the user to press a key
  trap   #1
  addq.l #6,sp
  move.w #conin,-(sp)      get a character from the console
  trap   #1
  addq.l #2,sp
  tst.w  disk_flg          error occurred in initialisation?
  bmi    no_disk           if so then just quit
  clr.w  -(sp)
  move.l #code_end-ramdisk,-(sp)    reserve required memory
  move.w #k_proces,-(sp)            then exit program
  trap   #1

* Routine called when an error occurres during installation
no_disk
  move.w #term,-(sp)       quit without installing ramdisc
  trap   #1

* Routine which does the actual installation
init
  bsr    rels_mem          call routine which releases memory
  tst.w  disk_flg          back to GEMDOS
  bmi    initexit          if an error occurred then exit
  bsr    get_size          call routine which gets ramdisc size
  tst.w  disk_flg          if error then exit
  bmi    initexit
  bsr    get_mem           call routine which allocates memory
  tst.w  disk_flg          for the ramdisc
  bmi    initexit          if an error occurred then exit
  bsr    set_disk          call routine which inits disc
  bsr    setvec            call routine which sets up ramdisc
  bset   #3,drvbits+3      tell TOS about ramdisc
initexit
  rts

* Routine which gives all unused memory back to GEMDOS
rels_mem
  move.l $c(a6),d0         get the length of the text section
  add.l  $14(a6),d0        add length of initialised data
  add.l  $1c(a6),d0        add length of uninitialised data
  add.l  #$100,d0          add length of the base page
  move.l d0,-(sp)          push all of that on to the stack
  move.l a6,-(sp)          push start address
  clr.w  -(sp)             null word
  move.w #setblock,-(sp)   call GEMDOS routine which releases
  trap   #1                memory
  add.l  #12,sp            adjust the stack pointer
  tst.l  d0                has an error occurred?
  bne    rels_err          if yes jump to rels_err
  rts

* Routine which is called if GEMDOS signals an error when
* memory is being handed back to GEMDOS
* This subroutine should never be called - hopefully
rels_err
  subq.w #1,disk_flg       make disk_flg reflect that an error
  pea    blk_str           has occurred
  move.w #prntln,-(sp)     print a message to indicate that an
  trap   #1                error has occurred
  addq.l #6,sp
  rts

* Routine which determines the size of ramdisk required
get_size
```

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```
  lea    $81(a6),a0        get address of command line
  tst.b  (a0)              test for empty command line
  beq    usage             error - print  program usage
spc_loop
  cmp.b  #' ',(a0)+        skip all space characters
  beq    spc_loop
  subq.l #1,a0             kludge correct address
  cmp.b  #' ',(a0)         if end of string encountered
  ble    cmd_err           error out
  move.l a0,a1             save start address of string for
  move.l a0,strt_adr       use later
  clr.l  d0                clear counter
num_loop
  cmp.b  #' ',(a1)         if a non-numeric is encountered
  bgt    not_end
  clr.b  (a1)              kludge an end of string marker
  bra    end_str           and then break out of loop
not_end
  cmp.b  #'0',(a1)
  blt    cmd_err           if character is not numeric
  cmp.b  #'9',(a1)+        cause an error
  bgt    cmd_err
  addq.l #1,d0             increament string counter
  bra    num_loop          loop again
end_str
  cmp.b  #2,d0             if string length < 2
  blt    too_smll          then error
  cmp.b  #4,d0             if string length > 4
  bgt    too_lrge          then error
  move.l disk_siz,d0       initialise storage register
get_num
  mulu   #10,d0            multiply size by ten
  move.b (a0)+,d1
  sub.b  #'0',d1           subtract ascii base to get digit
  add.l  d1,d0             add onto ramdisc size
  tst.b  (a0)              any more characters?
  bne    get_num           yes to loop again
  add.l  #9,d0             add 9K for TOS sectors
  move.l #10,d1
  asl.l  d1,d0             shift size to get size in bytes
  move.l d0,disk_siz       store size
  move.l #-1,-(sp)
  move.w #malloc,-(sp)     see how much free memory there is
  trap   #1
  addq.l #6,sp
  cmp.l  disk_siz,d0       ramdisc too large?
  blt    too_lrge          yes so error out
  rts                      return to caller

* Routine which is called if no command line is supplied
usage
  sub.w  #1,disk_flg       make disk_flg reflect that error
  pea    usge_str          has occurred
  move.w #prntln,-(sp)     print the error string
  trap   #1
  addq.l #6,sp             restore sp
  rts                      return to caller

* Routine which is called if a dud command line is supplied
cmd_err
  sub.w  #1,disk_flg       make disk_flg reflect that an
  pea    cmd_str           error has occurred
  move.w #prntln,-(sp)     print the error string
  trap   #1
  addq.l #6,sp             restore sp
  rts                      return to caller

* Routine called if size of ramdisc requested too small
too_smll
  sub.w  #1,disk_flg       make disk_flg reflect that an
  pea    smll_str          error has occurred
  move.w #prntln,-(sp)     print the error string
  trap   #1
  addq.l #6,sp
  rts

* Routine called if size of ramdisc requested is too large
too_lrge
  sub.w  #1,disk_flg       make disk_flg reflect that an
  pea    lrge_str          error has occurred
  move.w #prntln,-(sp)     print the error string
  trap   #1
  addq.l #6,sp
  rts

* Routine which attempts to reserve memory for the ramdisc
get_mem
  move.l disk_siz,-(sp)    push the amount of memory required
  move.w #malloc,-(sp)     use malloc to reserve the memory
  trap   #1
  addq.l #6,sp
  cmp.l  #0,d0             has an error occurred?
  bls    mem_err           if so jump to mem_err
  move.l d0,disk_adr       else store start addr of ramdisc
  rts

* Routine called if an error occurres allocating memory
mem_err
  subq.w #1,disk_flg       indicate an error
  pea    mem_str
  move.w #prntln,-(sp)     print message to indicate that
  trap   #1                memory could not be allocated
  addq.l #6,sp             for the ramdisc
  rts

* Routine which prints the size of ramdisc
prnt_sz
  move.l strt_adr,-(sp)    push address of string
  move.w #prntln,-(sp)     call GEMDOS to print string
  trap   #1
  addq.l #6,sp
  rts

* Routine which initialises the ramdisc
set_disk
  clr.w  -(sp)             use XBIOS to create boot sector
  move.w #2,-(sp)          not executable, single sided,
  move.l #$1000000,-(sp)   random serial number
  move.l disk_adr,-(sp)    address of Ramdisc buffer
  move.w #protobt,-(sp)    call XBIOS
  trap   #14
  lea    14(sp),sp         quick & dirty way to reset stack
  move.l disk_adr,a0       get address of ramdisc memory
  move.l disk_siz,d0       get disc size in bytes
  move.l #11,d1            convert to sectors
  asr.l  d1,d0
  lea    19(a0),a0         set up the number of sectors
  move.b d0,(a0)+          on the disc in 8086 format
  lsr.b  #8,d0             swap lo and hi bytes of word
  move.b d0,(a0)           store second 8086 byte
  move.l disk_siz,d0       load size of disk
  subq.l #1,d1
  asr.l  d1,d0             get the number of data clusters
  sub.l  #9,d0
  move.w d0,numcl          store the number of clusters
  rts

* Routine which re-vectors the TOS hard disc bindings
setvec
  move.l hdv_bpb,old_bpb     save address of old bpb
  move.l hdv_rw,old_rw       save address of old R/W
  move.l mediach,old_mdch    save address of old mediach
  move.l #new_bpb,hdv_bpb    re-vector bpb handler
  move.l #new_rw,hdv_rw      re-vector R/W handler
  move.l #new_mdch,mediach   re-vector media change
  rts

new_bpb
  cmp.w  #3,4(sp)          is drive D required?
  beq    do_bpb            yes
  move.l old_bpb,-(sp)     no, so call old BPB handler
  rts
do_bpb
  move.l  #bpb,d0          return to caller with address of
```

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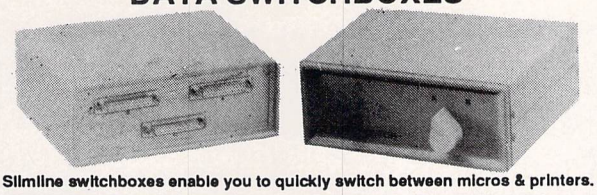

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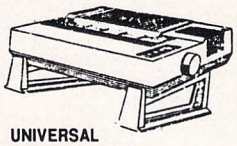

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◀ *From Page 94*

```
  rts                   BPB in D0

new_rw
  cmp.w  #3,14(sp)      is drive D required?
  beq    do_rw          yes
  move.l old_rw,-(sp)   no, call old handler
  rts
do_rw
  move.w 12(sp),d0      get the logical sector number
  move.l #9,d1
  asl.l  d1,d0          times 512 to get byte offset
  add.l  disk_adr,d0    into ramdisk memory
  move.l d0,a0          move into address register
  move.l 6(sp),a1       get the buffer address
  move.w 10(sp),d1      number of sectors to transfer
  sub.w  #1,d1          alter number for dbcc opcode
  btst   #0,5(sp)       Read or write
  beq    transfer       its read, don't swap registers
  exg    a0,a1          swap registers as same code used
transfer
  move.l #127,d0        128 longwords per sector
l_sec_lp
  move.l (a0)+,(a1)+    transfer longword
  dbra   d0,l_sec_lp    do 128 times (127 for dbcc)
  dbra   d1,transfer    do for required sectors
  clr.l  d0
  rts

new_mdch
  cmp.w  #3,4(sp)       is drive D required?
  beq    do_mdch        yes
  move.l old_mdch,-(sp) no, call old handler
  rts
do_mdch
  clr.l  d0             Ramdisc media never changes
  rts                   return to caller

* Set up the BIOS Parameter Block (bpb) for the ramdisc
bpb
recsiz   dc.w $200      sector size in bytes
clsiz    dc.w 2         cluster size in sectors
clsizb   dc.w $400      cluster size in bytes
rdlen    dc.w 7         directory size in sectors
fsiz     dc.w 5         FAT size in sectors
fatrec   dc.w 6         sector number of 2nd FAT
datrec   dc.w 18        number of first data cluster
numcl    dc.w 0         number of data clusters (K's)
bflags   ds.l 4         BIOS flags

* Note : numcl is set to zero as it will be setup once size of
* disk is known

* Variables used
old_bpb  ds.l 1         address of old BPB handler
old_rw   ds.l 1         address of old R/W handler
old_mdch ds.l 1         address of old Mediach handler
disk_flg ds.w 1         initialisation status variable
disk_adr ds.l 1         address of Ramdisk buffer
disk_siz ds.l 1         size of disk
strt_adr ds.l 1         start address of a string
code_end

* General output strings
banner   dc.b 'Atari ST Safe Ramdisk.',13,10
  dc.b '(c) Copyright 1987 Richard Phillips.',13,10,13,10,0
usge_str dc.b 'usage : ramdisk.ttp <size>.',13,10,0
cmd_str  dc.b 'Error in command line parameter.',13,10,0
smll_str dc.b 'Ramdisk size too small.',13,10,0
lrge_str dc.b 'Ramdisk size too big.',13,10,0
blk_str  dc.b 'Can',39,'t release memory.',13,10,0
mem_str  dc.b 'Error in meory allocation.',13,10,0
success  dc.b 'K Ramdisk installed.',13,10,0
err_str  dc.b 13,10,'No Ramdisk installed.',13,10,0
exit_str dc.b 13,10,'Press any key to exit.',13,10,0
the_end  end
```

Basic listing

```
  10 rem  ************************
  20 rem  *                      *
  30 rem  *Ram Disc Program Creator*
  40 rem  *  By  Richard Phillips  *
  50 rem  *   (c) Atari ST User    *
  60 rem  *                      *
  70 rem  ************************
  80 rem
  90 counter = 1
 100 open "R",1,"ramdisc.ttp",1
 110 field #1,1 AS filedata$
 120 read data$
 130 byte = val ( data$ )
 140 if byte = -1 then goto 200
 150 file$ = chr$ ( byte )
 160 lset filedata$ = file$
 170 put 1,counter
 180 counter = counter + 1
 190 goto 120
 200 close 1
 210 end
 220 print "Finished"
 230 rem * Program Data *
1000 data 96,26,0,0,4,180,0,0,0,0
1010 data 0,0,0,0,0,0,0,0,0,0
1020 data 0,0,0,0,0,0,0,0,44,111
1030 data 0,4,72,121,0,0,3,126,63,60
1040 data 0,9,78,65,92,143,72,121,0,0
1050 data 0,130,63,60,0,38,78,78,92,1
43
1060 data 74,121,0,0,3,112,106,0,0,20
1070 data 72,121,0,0,4,126,63,60,0,9
1080 data 78,65,92,143,96,0,0,20,97,0
1090 data 1,240,72,121,0,0,4,103,63,6
0
1100 data 0,9,78,65,92,143,72,121,0,0
1110 data 4,152,63,60,0,9,78,65,92,14
3
1120 data 63,60,0,7,78,65,84,143,74,1
21
1130 data 0,0,3,112,107,0,0,16,66,103
1140 data 47,60,0,0,3,126,63,60,0,49
1150 data 78,65,63,60,0,0,78,65,97,0
1160 data 0,56,74,121,0,0,3,112,107,0
1170 data 0,44,97,0,0,108,74,121,0,0
1180 data 3,112,107,0,0,30,97,0,1,88
1190 data 74,121,0,0,3,112,107,0,0,16
1200 data 97,0,1,144,97,0,1,222,8,248
1210 data 0,3,4,197,78,117,32,46,0,12
1220 data 208,174,0,20,208,174,0,28,6
,128
1230 data 0,0,1,0,47,0,47,14,66,103
1240 data 63,60,0,74,78,65,223,252,0,
0
1250 data 0,12,74,128,102,0,0,4,78,11
7
1260 data 83,121,0,0,3,112,72,121,0,0
1270 data 4,50,63,60,0,9,78,65,92,143
1280 data 78,117,65,238,0,129,74,16,1
03,0
1290 data 0,146,12,24,0,32,103,250,83
,136
1300 data 12,16,0,32,111,0,0,154,34,7
2
1310 data 35,200,0,0,3,122,66,128,12,
17
1320 data 0,32,110,0,0,8,66,17,96,0
1330 data 0,22,12,17,0,48,109,0,0,122
1340 data 12,25,0,57,110,0,0,114,82,1
28
1350 data 96,222,12,0,0,2,109,0,0,126
1360 data 12,0,0,4,110,0,0,142,32,57
1370 data 0,0,3,118,192,252,0,10,18,2
4
1380 data 4,1,0,48,208,129,74,16,102,
240
1390 data 6,128,0,0,0,9,34,60,0,0
1400 data 0,10,227,160,35,192,0,0,3,1
18
1410 data 47,60,255,255,255,255,63,60
,0,72
1420 data 78,65,92,143,176,185,0,0,3,
118
1430 data 109,0,0,76,78,117,4,121,0,1
1440 data 0,0,3,112,72,121,0,0,3,191
1450 data 63,60,0,9,78,65,92,143,78,1
17
1460 data 4,121,0,1,0,0,3,112,72,121
1470 data 0,0,3,221,63,60,0,9,78,65
1480 data 92,143,78,117,4,121,0,1,0,0
1490 data 3,112,72,121,0,0,4,0,63,60
1500 data 0,9,78,65,92,143,78,117,4,1
21
1510 data 0,1,0,0,3,112,72,121,0,0
1520 data 4,26,63,60,0,9,78,65,92,143
1530 data 78,117,47,57,0,0,3,118,63,6
0
1540 data 0,72,78,65,92,143,12,128,0,
0
1550 data 0,0,99,0,0,10,35,192,0,0
1560 data 3,114,78,117,83,121,0,0,3,1
12
1570 data 72,121,0,0,4,74,63,60,0,9
1580 data 78,65,92,143,78,117,47,57,0
,0
1590 data 3,122,63,60,0,9,78,65,92,14
3
1600 data 78,117,66,103,63,60,0,2,47,
60
1610 data 1,0,0,0,47,57,0,0,3,114
1620 data 63,60,0,18,78,78,79,239,0,1
4
1630 data 32,121,0,0,3,114,32,57,0,0
1640 data 3,118,34,60,0,0,0,11,226,16
0
1650 data 65,232,0,19,16,192,224,8,16
,128
```

```
 1660 data 32,57,0,0,3,118,83,129,226,
160
 1670 data 4,128,0,0,0,9,51,192,0,0
 1680 data 3,82,78,117,35,248,4,114,0,
0
 1690 data 3,100,35,248,4,118,0,0,3,10
4
 1700 data 35,248,4,126,0,0,3,108,33,2
52
 1710 data 0,0,2,194,4,114,33,252,0,0
 1720 data 2,220,4,118,33,252,0,0,3,46
 1730 data 4,126,78,117,12,111,0,3,0,4
 1740 data 103,0,0,10,47,57,0,0,3,100
 1750 data 78,117,32,60,0,0,3,68,78,11
7
 1760 data 12,111,0,3,0,14,103,0,0,10
 1770 data 47,57,0,0,3,104,78,117,48,4
7
 1780 data 0,12,34,60,0,0,0,0,9,227,160
 1790 data 208,185,0,0,3,114,32,64,34,
111
 1800 data 0,6,50,47,0,10,4,65,0,1
 1810 data 8,47,0,0,0,5,103,0,0,4
 1820 data 193,73,32,60,0,0,0,127,34,2
16
 1830 data 81,200,255,252,81,201,255,2
42,66,128
 1840 data 78,117,12,111,0,3,0,4,103,0
 1850 data 0,10,47,57,0,0,3,108,78,117
 1860 data 66,128,78,117,2,0,0,2,4,0
 1870 data 0,7,0,5,0,6,0,18,0,0
 1880 data 0,0,0,0,0,0,0,0,0,0
 1890 data 0,0,0,0,0,0,0,0,0,0
 1900 data 0,0,0,0,0,0,0,0,0,0
 1910 data 0,0,0,0,0,0,0,0,0,0
 1920 data 0,0,65,116,97,114,105,32,83
,84
 1930 data 32,83,97,102,101,32,82,97,1
09,100
 1940 data 105,115,107,46,13,10,40,99,
41,32
 1950 data 67,111,112,121,114,105,103,
104,116,32
 1960 data 49,57,56,55,32,82,105,99,10
4,97
 1970 data 114,100,32,80,104,105,108,1
08,105,112
 1980 data 115,46,13,10,13,10,0,117,11
5,97
 1990 data 103,101,32,58,32,114,97,109
,100,105
 2000 data 115,107,46,116,116,112,32,6
0,115,105
 2010 data 122,101,62,46,13,10,0,69,11
4,114
 2020 data 111,114,32,105,110,32,99,11
1,109,109
 2030 data 97,110,100,32,108,105,110,1
01,32,112
 2040 data 97,114,97,109,101,116,101,1
14,46,13
 2050 data 10,0,82,97,109,100,105,115,
107,32
 2060 data 115,105,122,101,32,116,111,
111,32,115
 2070 data 109,97,108,108,46,13,10,0,8
2,97
 2080 data 109,100,105,115,107,32,115,
105,122,101
 2090 data 32,116,111,111,32,98,105,10
3,46,13
 2100 data 10,0,67,97,110,39,116,32,11
4,101
 2110 data 108,101,97,115,101,32,109,1
01,109,111
 2120 data 114,121,46,13,10,0,69,114,1
14,111
 2130 data 114,32,105,110,32,109,101,1
11,114,121
 2140 data 32,97,108,108,111,99,97,116
,105,111
 2150 data 110,46,13,10,0,75,32,82,97,
109
 2160 data 100,105,115,107,32,105,110,
115,116,97
 2170 data 108,108,101,100,46,13,10,0,
13,10
 2180 data 78,111,32,82,97,109,100,105
,115,107
 2190 data 32,105,110,115,116,97,108,1
08,101,100
 2200 data 46,13,10,0,13,10,80,114,101
,115
 2210 data 115,32,97,110,121,32,107,10
1,121,32
 2220 data 116,111,32,101,120,105,116,
46,13,10
 2230 data 0,0,0,0,0,6,14,14,10,22
 2240 data 14,22,34,14,14,70,6,44,58,3
6
 2250 data 20,14,6,18,6,18,6,18,6,16
 2260 data 24,8,6,16,28,16,6,24,16,10
 2270 data 8,8,6,8,8,20,8,18,20,62
 2280 data 0,-1
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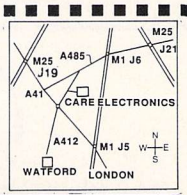

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ADVENTURES

Brillig lends a hand in solving problems for fantasy fans

Adventurer Supreme

THE postman has taken to his sick bed following your latest deluge of letters. The poor old chap's back simply isn't up to coping with the weight, and it's ironic that he only volunteered for this particular round because he thought no one in their right mind would bother writing to a decrepit old adventurer with the unlikely name of Brillig.

My star reader this month has to be R.G.B. Marshall of Congleton in Cheshire. RGB is a prolific solver of adventures and has been sending in complete solutions faster than I can write the reviews! Even though it is well known that I have a brain the size of a planet, RGB's achievements in the field of adventuring are beginning to make Brillig's abilities appear puny by comparison.

Among the goodies he's submitted are detailed solutions to Leisure Suit Larry, Space Quest II, Police Quest and Beyond Zork – yes, he's solved that already – and bags of hints and tips for Lurking Horror and Starcross. The man must be an adventuring genius.

He's set my mouth watering concerning Beyond Zork: He says that it has one of the best endings he's seen in an adventure, and he should know as he's played many. The game has you on cloud nine for ages and gives you a tremendous feeling of satisfaction when you finish. I can't wait to get stuck back into it again after hearing that.

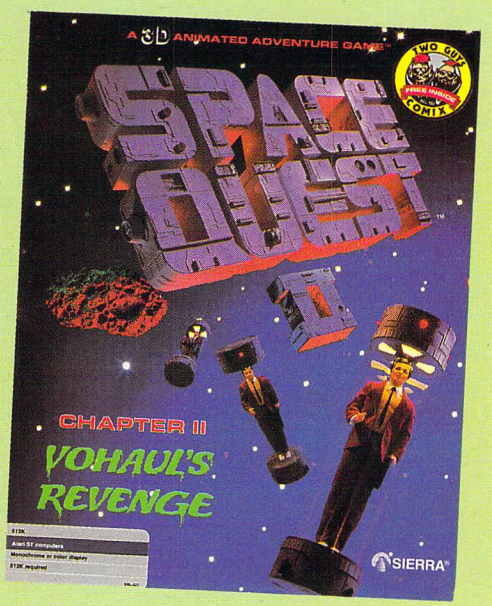
Let me now thank RGB for his prodigious services to the cause of adventuring and award him Brillig's much-coveted honorary title of ST Adventurer Supreme. Keep on sending in your material, RGB, it is highly appreciated. And while you're at it, how about a detailed solution to Mirrorsoft's Dungeon Master? It should take you all of 30 minutes to crack, knowing your talents.

RGB has also let it be known that he is willing to assist any adventurers if they drop him a line at 3 Mereside Avenue, Congleton, Cheshire CW12 4JZ. The list of adventures he is able to help with is too long to list here but suffice to say it covers the most popular Infocom and Level 9 games as well as many others.

My thanks also to an old chum, W.K. Walraven who, true to his word, has sent in a detailed solution to Guild of Thieves. Special mention, too, of Allen and Mark Errington of Durham for their complete map of Leisure Suit Larry in the Land of the Lounge Lizards. They and M. Scholes of Huddersfield have pointed out that Leisure Suit Larry bears more than a passing resemblance to a much earlier Sierra program called Softporn Adventure which used to be available for the 8 bit Atari range.

Indeed, Allen and Mark have sent me a map of Softporn Adventure and this confirms that LSL is actually a new version based on this earlier adventure. Well spotted, lads.

Tim Brown of Norbury has sent in some



much-prized tips on Déjà Vu – he's the first to do so. Well done, Tim – I needed those. I wonder how many more of you ST adventurers have tried Déjà Vu yet – I can highly recommend it if you haven't.

Mr J. Capener has supplied some hints for the hilarious but testing Leather Goddesses of Phobos, while the anonymous Z of Ipswich has provided a generous helping of tips for Mindshadow. Z is having a spot of bother of his own with Hitch Hiker, as is Andrew Dickinson of South Shields. Hope this month's tips solve your problems.

Geoff Brent, from French Forest in Australia, is surprised that I did not include Bureaucracy in my Top 20 favourites. He finds it thoroughly entertaining and very witty – but extremely frustrating. My only defence is that if I had put every Infocom adventure I liked into the Top 20, I'm afraid there would have been no room for any other company.

Geoff would like to know how to get off the aeroplane in Bureaucracy – the answer is in the panel. And, Geoff, if you're looking for another amusing Infocom adventure to play, look no further than Stationfall – I think it's probably Infocom's best.

I have received letters from Noah Bunn (aged 6) and Daniel Gilkes (aged 7) – can these be our youngest ST adventurers? And I wonder who our oldest adventuring reader is? Write in and tell me if you think it is you.

G. Blake of Southampton would like to find out how he can get his hands on a coin in Stationfall while D. Jessup from Edenbridge wishes he could find out how he can escape getting snared once past the swamp in Space Quest II. Answers are also in the panel, gentlemen.

Ramzi Khali has written in from Abu-Dhabi with some helpful hints on King's Quest II and III. Can anyone tell him how he can make the captain appear in the tavern and if there's a magic lamp to be had?

In the same adventures Jon Akerman of Surbiton wants to know where he can lay his hands on the wand in KQIII while Derek P. Inwood of Bracknell wants some light in KQII. This month's hints and tips should help.

The clockmaker's shop in Jinxter is causing Richard Douglas of Wandsworth some pain, while Alexis Wadsley of Hildenborough and Clive Mewse of Berkhamsted are held up in Guild of Thieves. Fret no more – help is at hand.

Wizard's Crown is troubling C. Willis from the Isle of Man. He has only found one dungeon, a tavern, a mansion and the laboratory and has no money to stay at the inn. He also finds the short day a

Turn to Page 100 ▶

◀ *From Page 99*

problem and his morale loss is running at a high rate. Who can help?

Mirrorsoft's Dungeonmaster – reviewed in May's *Atari ST User* – is a cracking fantasy game. The more you play it, the more it grips. You just can't let go until you've completed it, and that takes some doing. Whatever else you do, don't be without this one in your collection or you'll miss out on what old Brillig firmly believes will be the main contender for the ST game of the year award.

And wouldn't you just know it – we already have a reader who has completed Dungeonmaster. The intrepid adventurer is Bob Goffman – Goffo to his friends – who has written from Paris enclosing some useful information.

Goffo's discovered that there are 14 levels and if you want to find the firestaff you'd be well advised to search level seven for it. The power gem lies much deeper, so keep going onwards and downwards. Thanks also for the spell tips, Goffo. Well done that man.

Just space for a quick mention of Rainbird's newest Magnetic Scrolls adventure. Now from the team who brought you The Pawn, Guild of Thieves and Jinxter comes Corruption, an adventure set in the dog-eat-dog world of high finance.

Set up by your double-dealing partner, you'll find yourself behind bars where a drugs baron is intent on using you as a motorway foundation. You'll need all your wits and deviousness to deal with the villains in Corruption, which concentrates on character manipulation and information extraction rather than the usual gathering of objects for unusual uses.

Graphics are reputed to be even better than the earlier games. Watch this space for a full review of what promises to be yet another Rainbird dazzler.

HINTS AND TIPS

HITCH HIKERS GUIDE TO THE GALAXY

Want some intelligence to open the screening door?

● Show the door how clever you are by carrying tea and no-tea at the same time. It can be done!

Don't know how to handle the electronic hitch-hiking device?

● Press the green button. In the dark keep waiting – and read the responses *very* carefully. Notice that you can now smell? So smell!

SPACE QUEST II

Caught up by a snare?

● You can't avoid being snared and imprisoned by the hunter. In the cage, call him twice and when he comes near, let him have it with the spore. Then take the key from his inert body.

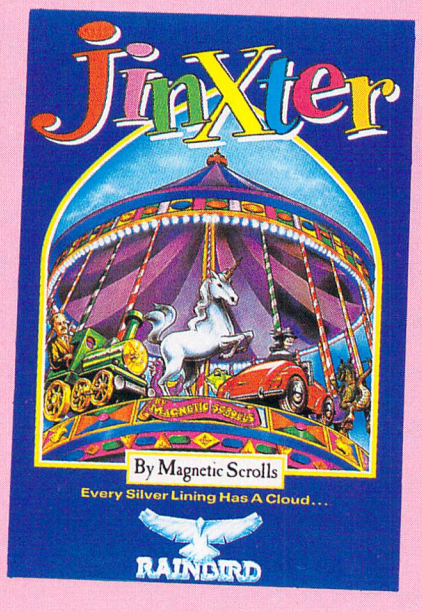
KING'S QUEST II

Want a light for the dark stairs?

● Look for a candle in the dresser in the upstairs bedroom.

Key to the chest missing?

● You will need to use the mallet and stake on Dracula to get it.



JINXTER

Need the metal stool from the clockmaker's shop?

● Knock at the door. Throw something at the oil lamp. Oojimy the hot stool.

STATIONFALL

Can't find a coin?

● Try blasting the box in the loan shark's office.

KING'S QUEST III

Want some money for a drink?

● Pull the rope in the hole of the tree near the desert. Be sure when you climb the tree that there are no bandits waiting above!

Wand not available?

● Try searching in the study.

GUILD OF THIEVES

Rats on the stairs a problem?

● Open the stopcock, pull the pipe, wait close the stopcock and then proceed down the stairs.

Bank manager won't let you get to the vault?

● First chew the gum and teach the bird to say Hooray. In the office, shake the champagne bottle, drop the cage and bottle and wait to be escorted out. When the door has been locked behind you, put the gum in the keyhole. Then sing and fly.

BUREAUCRACY

Stuck on the plane?

● Sit in seat 3C and wait for food. Go to seat 8D and press light button. Return to 3C. When the phone rings, go to the back and answer it then say STINGLAI KA'ABI to the attendant.

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THIS month's gallery features the work of the combined talents of Susan Frudd and Wayne Grundy. Together they have produced an entertaining variety of pictures ranging from the frightning Madness to the cute Love.

The pictures were created using The Advanced OCP Art Studio in Neo format and took around one and a half to two days each to draw.

Gallery is an opportunity for anyone with the slightest artistic bent to demonstrate not only their own ability, but also the superb graphic capability of the Atari ST.

If you have a work of art you would like to see exhibited on our world wide stage, why not send it to Gallery. Remember though, anything you submit must be all your own work, you must own the copyright, and you must provide us with written permission to publish it.

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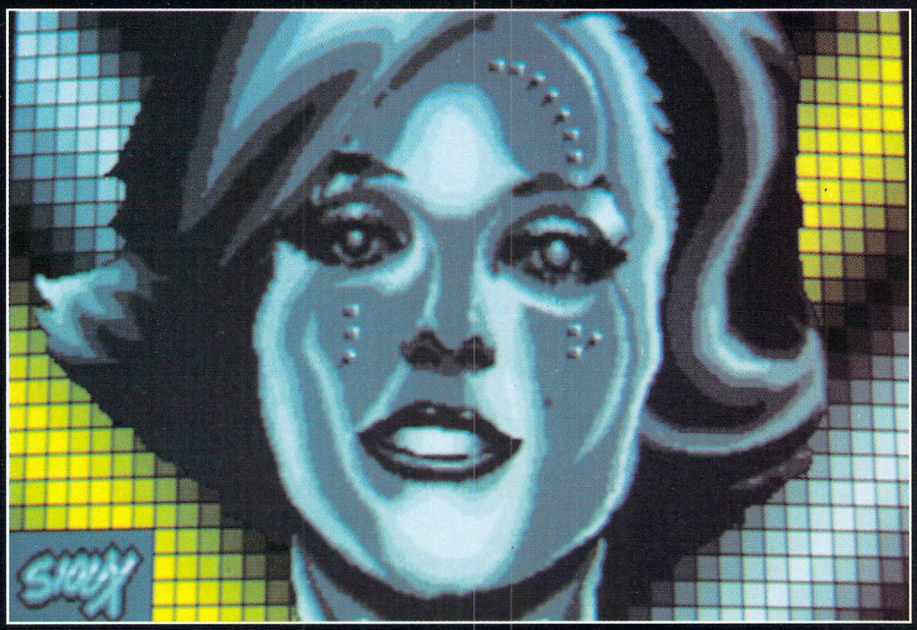

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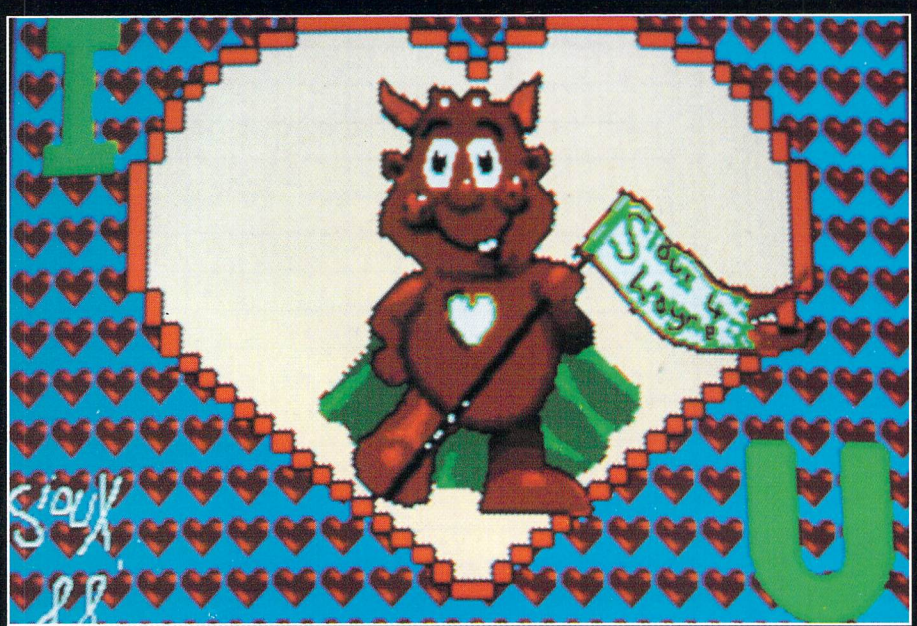

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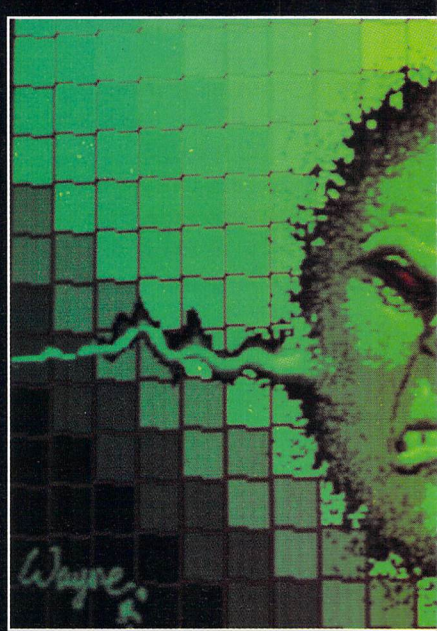

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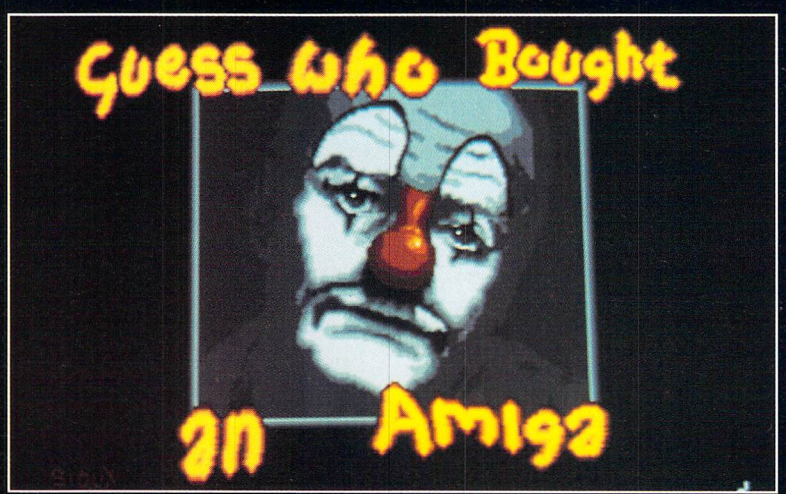

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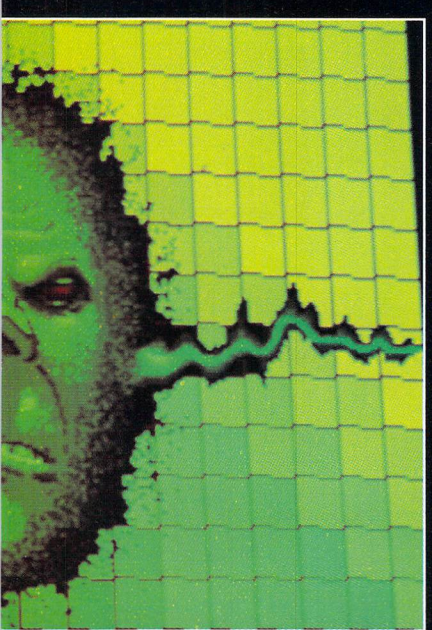

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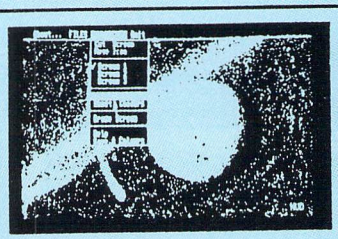

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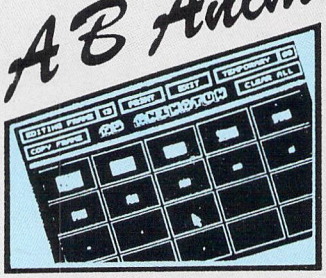

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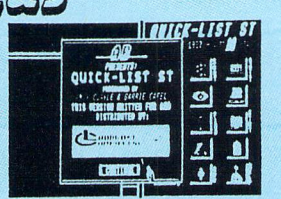

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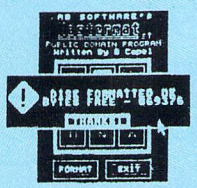

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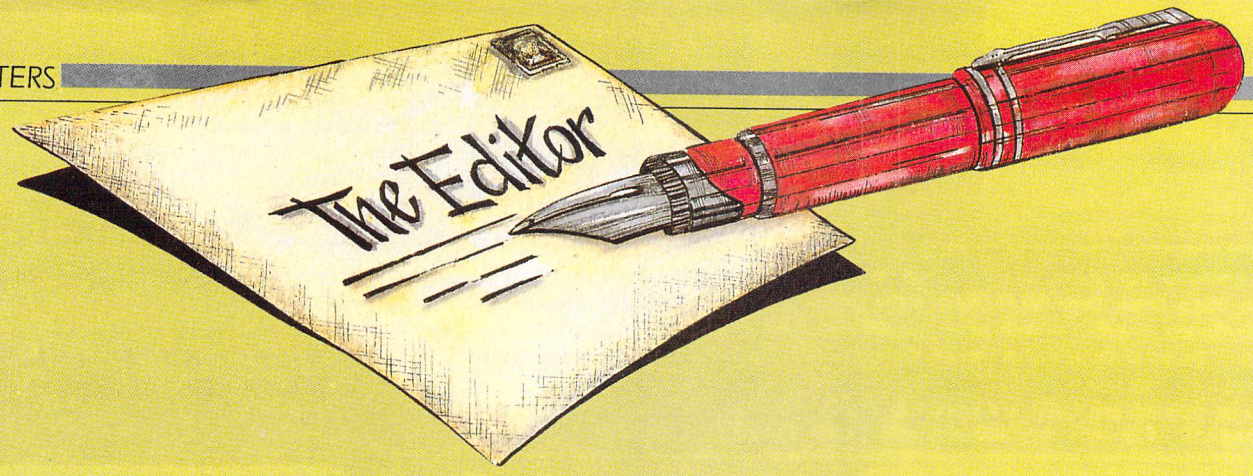


Carrying out mouse surgery

I HAVE suffered a similar problem to F. Isaacson (Atari ST User *May 1988*) *with the left mouse button, and have found quite a simple solution, although it is somewhat Blue Peter-style.*

First turn the mouse on its back, then undo and remove the two screws by the tail. Remove the top by holding the base firmly and pulling above the tail where the two buttons meet.

The problem with the switch can then be solved by building up a strut that transfers the mechanical movement of the button to the pad on the circuit board, by the addition of two or three pieces of sticky tape.

This should increase the length of the strut enough to compensate for the pad wearing down. It is then simply a matter of putting the mouse back together again, ensuring the tail is properly in position before screwing it together. It may be necessary to experiment a few times to find the best position for the tape.

I believe your answer to Andrew Gane (Atari ST User, *May 1988*), *may have been in error concerning the 68010 processor. You state that since software will not use any of the new instructions on the chip there will be no performance improvement.*

Although the additional instructions will not be used – unless you write your own code – some of the existing ones have been optimised so they require fewer clock cycles to complete their function, which will increase speed.

More importantly, the DBxx function has been given a loop mode, which means that it will execute much faster when used with a displacement of –4. This means block transfers can be carried out much faster. Consider the following simple piece of code:

```
LEA source,A0
LEA destination,A1
MOVE.W #length,D0
cpy_byte
MOVE.B (A0)+,(A1)+
DBRA D0,cpy_byte
RTS
```

This code will work on both the 68000 and 68010. However on the former each time the loop is executed the MOVE and DBRA instructions will be loaded from memory.

On the 68010 the MOVE instruction will be held in the chip while the DBRA instruction is being executed. This means the processor does not have to recall it from memory once the DBRA has been completed. A similar process takes place for the DBRA while the MOVE is being executed.

The upshot is that for a loop of this type the 68010 has only to load the instructions once, while the 68000 has to load the six bytes that make up the loop D0 times. Hence the 68010's speed advantage.

I would not advise anyone to try to change the processor, as it will probably be more trouble than it is worth. The speed advantage will be of little advantage on word processors and other such things, while it may mess up the timing in games, making things happen at different speeds to those the programmer intended.

The speed change may also mess up careful timing for dealing with some I/O devices, so the processor can no longer communicate with them. **– Nicholas Sillito, Weeping Cross, Stafford.**

Too warm for comfort

*I WAS interested in the recent letter from L.J. Hallett (*Atari ST User, *May 1988), in which he was commenting on power supply failures in the ST series of machines.*

While I have, fortunately, not had the problem he mentions, it does seem to be too frequent for comfort, and I have noticed letters about it in several publications recently.

There may be several causes of this type of failure, but I strongly suspect that some of the blame must lie with the poor ventilation of the ST. The clearance underneath the machine is very small and the ventilation slot area is much smaller than would be found in a hi-fi amplifier of similar power rating.

The situation tends to be made worse by the fact that, by its nature, the machine is likely to be switched on for very long periods. Be careful not to obstruct the lower slots in any way, such as by standing the unit on a carpet or other soft surface. And avoid covering any of the upper slot area with discs, papers or books.

I have fixed some plastic feet about 14mm high on the underside of my unit to increase the clearance, and this seems to have greatly improved the air circulation – and the top is definitely a lot cooler.

A further improvement can be achieved by opening the machine and removing the large aluminium shielding plate. But don't try this unless you are quite sure of your ability in this area. **– D.K. Powell, Tupsley, Hereford.**

DBasic manual wanted

I HAVE obtained a public domain disc of the language DBasic. The disc info tells me that I can order a manual from America, but also that the person or company has no export license. Can you tell me anything about DBasic, or how I might obtain a manual?

Could you also tell me the relative processing speeds of ST Basic (old and new), Fast Basic and DBasic. **– A. Russell, Queenborough, Kent.**

● We haven't come across DBasic before, so we'll have to ask our readers for help with this one. In general, ST Basic is quite a slow performer, though the new version isn't as sluggish as its predecessor.

Fast Basic is much quicker, but in spite of its name, isn't really all that fast. HiSoft Basic, and HiSoft Power Basic are the speediest versions we've tried.

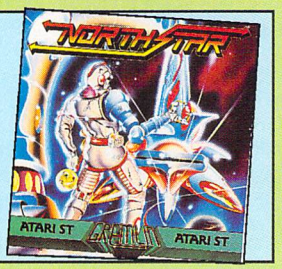
Marketing strategy

AS an owner of the Atari 1040ST and Apple Macintosh, I feel I am in a position to make certain judgements about the pros and cons of using these systems.

Atari has managed to produce a very powerful machine at a very reasonable price, but is unable to remove the stigma

Star Game for a Star Letter

Each month we'll select a letter of the month – and the sender will receive the program which our reviewers have rated Atari ST User Star game. This month, reader Sandra Vogel will receive Northstar, which is reviewed on Page 44. Letters on every subject of interest to Atari ST users are welcome. Send them to: The Editor, Atari ST User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.



Male chauvinist ST users

I AM a 24-year-old female ST user. As such, I suspect I am quite rare, though I did recently read of a 48-year-old mother of two who was also an ST owner, and a dab hand at Sentinel.

My reasons for writing are twofold. First I am sure there are some other female users out there, and I would like to start a national user group if enough people are interested. As yet, I have no concrete plans for the group, and would be willing to extend it beyond just ST users if enough interest is shown.

There would be a newsletter, but its content and format are by no means settled. Anyone vaguely interested, please drop me a line. If I get enough response the user group will be born.

My second reason for writing is to bring to the attention of ST users the blatant sexism of much of the software currently available.

This is clearly visible in gender roles described by many inlays. Our hero, in various guises, bravely fights off all manner of enemies to ensure safety, and often the hand of a fair maiden into the bargain.

There is also increasingly apparent sexism in the advertising of games. Currently we have Vixen and Strip Poker II which exploit women's bodies as much as the law will allow.

When it comes to gameplay I can usually forget the gender of my sprite, and the inlay blurb pales into insignificance. I am simply playing a good shoot-'em-up, ladders 'n levels or whatever.

In adventures gender is harder to forget, as to varying degrees it is reinforced by text and graphics. I certainly wouldn't touch Plundered Hearts with a bargepole. Never having seen a strip poker game I can't comment on these.

My point is that blatant misuse of gender stereotypes in advertising and inlay blurb is not impossible to avoid. It adds nothing to the quality of the game or gameplay of most software, and is an insult to the player's intelligence. (Those prepared to pay out over £20 for the titillation of a strip poker game are beyond recall, and probably have no intelligence to be insulted.)

Software houses should realise their responsibilities concerning sexism, and avoid it. It is not necessary for the production of a good game, and is adverse for both male and female players. **– Ms Sandra Vogel, 90 Thompson Avenue, Kew, Richmond, Surrey.**

● We agree wholeheartedly with most of your points, but the vast majority of ST users are male, and software companies are simply tailoring their products to appeal to this majority by making the main character a macho male Rambo type.

However, the main character in Vixen is a heroine – an athletic female who takes on all manner of fiends and monsters, and is the image of Corinne Russell, the model used in the advert.

of it being nothing more than a powerful games machine.

While Apple is now beginning to appeal to the corporate sectors of the computer market, those people who traditionally would have been fired for not buying IBM are now splashing out on the latest Mac equipment.

So where is this leading us? Well, instead of Atari making new modifications to its machines, I think perhaps it should concentrate on its marketing strategy.

In a bid to continually introduce more bells and whistles, Atari seems to get it wrong all the time. Regardless of the price of the machine, there are several factors which will keep Atari out of the mainstream business market.

Firstly, the software base. If Microsoft, Letraset, Aldus and many other large developers could be made to take an interest, this product would get the recognition it deserves, and not only from musicians and colleges.

Secondly, there is the general sales and marketing of the system itself. The majority of Atari dealers seem to be nothing more than glorified hi-fi salesmen who seem to think that showing a bouncing ball demonstration constitutes the leading edge of technology. A short walk down Tottenham Court Road any Saturday afternoon will prove this.

Finally, a word on the Abaq transputer. It may be all well and good launching this mind-boggling marvel at £3,000, but who is it aimed at?

The monitor needed to take advantage of this machine will probably cost the same again. **– Des Taylor, Beckenham, Kent.**

Now let's be serious

I HAVE recently bought an Atari 1040ST, and this is the first micro I've owned for many years. The Atari is not my first choice of machine, but is convenient because my partner works in the recording industry and can make use of the Midi facility.

For my own part, I am more interested in its use as a business and research tool. The specifications of the Atari, if not its construction, seem more than ample for this purpose.

Your magazine, however, while very readable and interesting, seems to concentrate more on games software. I am hoping you can tell me where I might find reviews of more business oriented software.

My first priorities are to obtain a reasonable word processor program and statistics package. I would also like to buy a more comprehensive manual – that supplied with the machine is wholly inadequate – and have details of programs available in the public domain. Unfortunately, my work at present rarely gives me the opportunity to visit specialist shops, so mail order is much more convenient. **– J. Novak, Wandsworth, London.**

● We are not a games-oriented magazine, despite this popular misconception, and try to cover the whole range of ST applications, including games, business, art and music.

The games section normally takes up around 10 pages, while the other 50 or so pages of editorial space are allocated to the other more serious subjects.

You'll find reviews of word processors in the April 1988 issue (Protext), March 1988 (WordPerfect) and February 1988 (K-Word 2 and TextPro).

We haven't reviewed any statistical

Turn to Page 108 ►

◀ From Page 107

packages, though you'll find reviews of spreadsheets in this issue (Digicalc), May 1988 (MasterPlan), April 1988 (Graphic-Sheet), October 1987 (VIP Professional).

All PD libraries produce catalogues listing their contents, and there are many to choose from. Several advertise in *Atari ST User*.

Cross assembler required

I AM an avid fan of Atari ST User *and have noticed several reviews of the 68000 assemblers available. However, I would like to know if any cross assemblers are available on which I could write Z80 or 6502 programs, and download the object code to my Spectrum, Amstrad or Commodore 64. If there are, what leads would I need?* **– C. Worsfold, Hornchurch, Essex.**

● We don't know of any commercially available cross assemblers, though some software companies have written their own for in-house programming.

If you have a CP/M emulator – like the one supplied with STs bought from Silica Shop – you can use a CP/M Z80 assembler to write Spectrum or Amstrad code. You'll need a lead to connect the RS232 ports together, and the other micros will need an interface with an RS232 as they don't have one built in like the ST. You'll probably need some comms software too.

There's a good public domain assembler, called ZSM, widely available from most PD libraries. We haven't used it extensively, but in our brief tests it appeared to work satisfactorily. We hope to feature the CP/M emulator in a future article.

Portuguese font designer

IN response to Paulo Cambraia's request in the May 1988 issue of Atari ST User *for help in typing Portuguese, you may be interested to know that I have written a public domain software package called Fontkit.*

It contains a font editor and loaders for editing and installing alternative screen and printer fonts, along with a large number of new fonts.

There is also a memory-resident utility for typing characters in the second half of the ST's character set directly from the keyboard, with an option for typing backwards, which may be of interest to anyone wanting to type Hebrew or Arabic.

Alternative screen fonts can be used with any ST program which normally uses the ST's own system font – this includes both Gem and non-Gem programs – and there are alternative printer fonts for a variety of 9 pin and 24 pin Epson-compatible printers.

Fontkit is currently available from ST Club (PO Box 20, Hertford, SG13 8NN), and possibly from other PD libraries, and I shall shortly be releasing a new version. I am also about to release an enhanced version called Fontkit Plus which is able, among other things, to edit Gdos fonts.

This will be available in the first instance to registered Fontkit users in return for a blank double-sided disc, or two blank single-sided discs, and £1 for copying and postage (registration itself costs £6). It may later be marketed commercially for about £10. **– Jeremy Hughes, Oxford.**

All at C with assembly language

AS I'm about to buy an ST I want to try my hand at C or assembly language, but I know absolutely nothing about them. What is the difference between them, and which is the simplest to use for a beginner?

I like the sound of GST C, which seems to have everything in it to start me off, but why is it so cheap at £19 while something like Mark Williams C is over £100? **– David Bain, Greenock, Strathclyde.**

● The "engine" underneath the bonnet of the ST is a microprocessor called a Motorola MC68000. This chip can only understand instructions given to it in a complex and difficult to learn language called 68000 machine code.

No one uses machine code; they use a much simpler substitute language and use a utility program to translate this into a form the processor can understand. Assembly language and C are two entirely different languages, but both produce 68000 machine code the processor can understand when run through a compiler.

C is an increasingly popular and quite powerful language, but can be difficult for beginners to learn. Assembly language is also difficult to learn, but is even more powerful and faster.

Generally, assembly language is used for writing fast arcade games, and C is used for more serious applications such as word processors, business packages and so on.

The difference between GST C and Mark Williams C is a bit like that between a Skoda and a Rolls Royce. GST C is a bargain basement C compiler with the minimum of features, whereas Mark Williams is far more powerful and flexible.

One notable absence in GST C is the lack of floating point arithmetic. This could be a serious limitation under certain circumstances, for instance, if you're trying to write a statistical or financial package. However, having said that, it is probably the easiest C package for a beginner.

Price increase compensation

DUE to rumours about price rises – now fact as shown in your magazine – I recently ran down to my nearest computer shop to buy my 520STFM. I was very annoyed, and was certainly not going to pay £100 extra for the same machine.

The Atari 520STFM may be good, but not that good. Surely now the ST is in the same price range as the Commodore Amiga many people are going to pay the extra for the Amiga? **– Mark Lever, Oldham, Lancashire.**

● Athough the price of the 520ST has been put up by £100, around £400 worth of software is included with the machine. On top of this, the new 520s appear to have double-sided drives – a fact not publicised by Atari. These extras more than compensate for the price rise.

Basically useless

AFTER reading the April 1988 issue of Atari ST User *I was so impressed by the capabilities of the ST that I immediately ordered a 520STFM. Having received the machine I was not disappointed.*

What a shame, though, to spoil such a great machine by only providing the barest of information with it. The few pages in the Basic manual supplied are virtually useless to anybody unfamiliar with Atari Basic. And I suspect they leave a great deal to be desired in informing users of the changes introduced by the new version of Basic, too.

Having realised I required more information, I bought the Atari ST Basic Training Guide published by Abacus before realising that it was written for the old version of Basic. I am certain that, like myself, many of your readers will be anxiously waiting for your promised article on the new Basic.

To date every attempt I have made to alter programs has ended with the machine displaying two bombs and then crashing. **– D. Ness, Macclesfield, Cheshire.**

● The first in a new series looking at programming using ST Basic can be found next month in *The Complete ST*.

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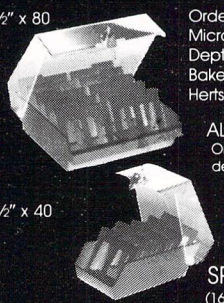

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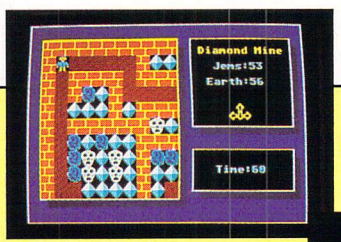

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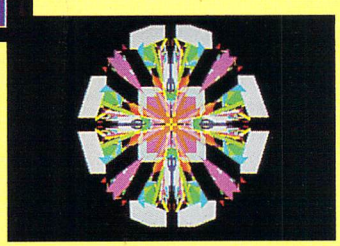

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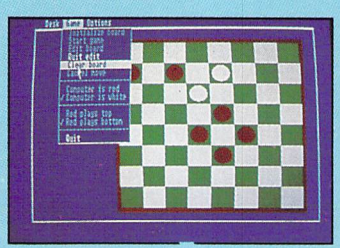

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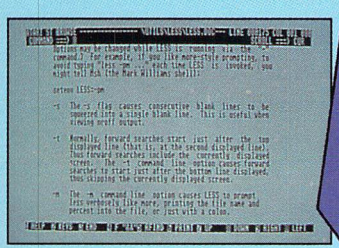

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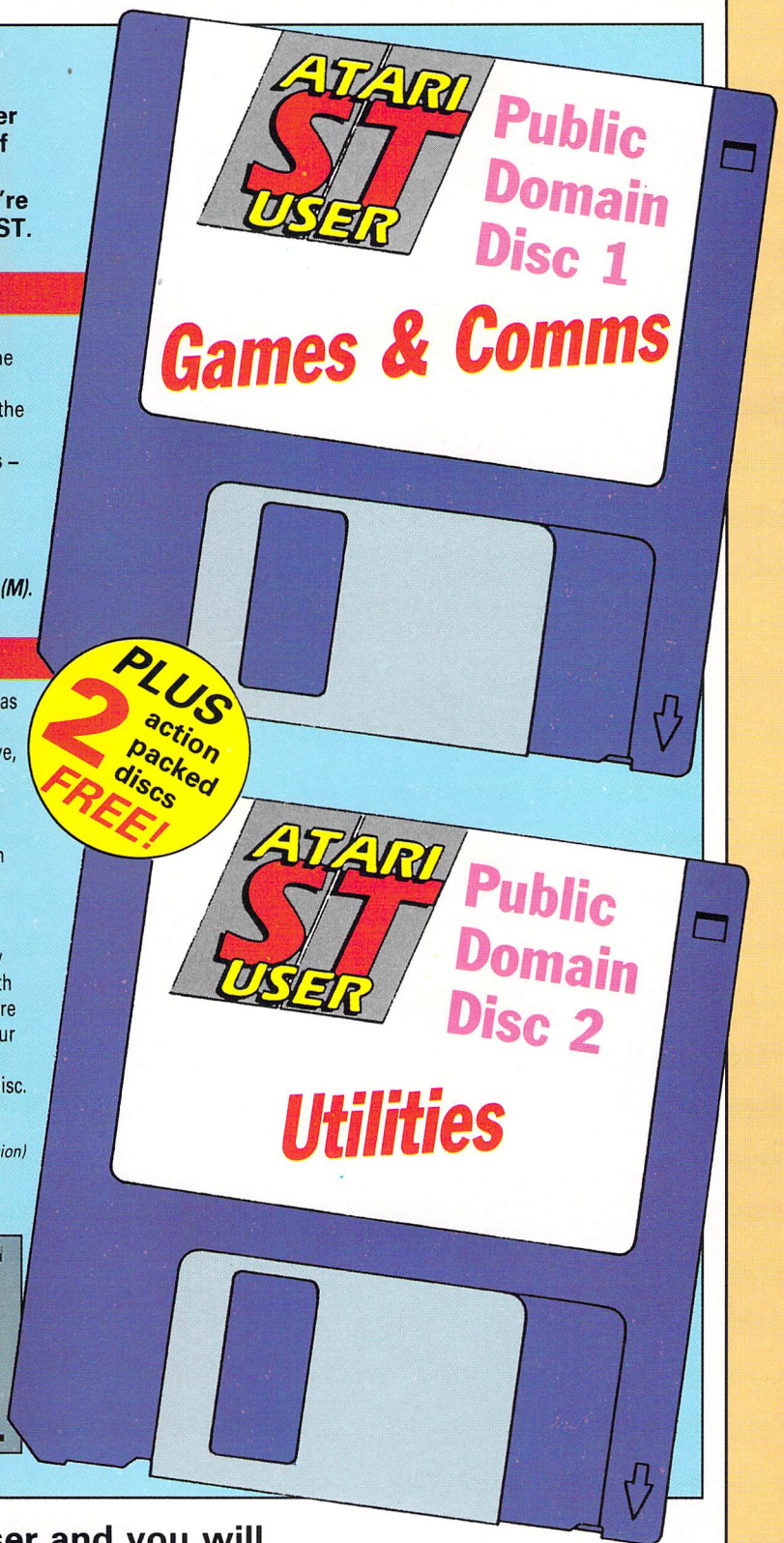

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October issue: Listings: Play Molecule, create a flight simulator, add a word counter desk accessory, keep track of your investments on the stock market. Reviews: Signum, Publishing Partner, GFA Draft, STuff, VIP, Road Runner, TNT, Eagles Nest.

November issue: Reviews: Knight Orc, Deathstrike, Sidewalk, Tai-Pan, public domain comms, MicroStuffer and Mirage. Create GFA Basic menus. Listings: DIY comms program, memory editor plus Diamond Mine – a multi-screen arcade game.

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March issue: Reviews: Tempus, PD Disc Utilities, PCB Designer, WordPerfect, Winter Olympiad, Wrestling, Tanglewood, Marble Madness, Backlash, Bubble bobble, Frost Byte, UMS, Bad Cat Leisure Suit Larry. Listings: Palette switching, accessory selector, mpg calculator. Features: Magnetic Scrolls, Tynesoft and US Gold interviews.

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May issue: Reviews: Gem-Forth, PD Forth, Partner, Quick-List, Certificate Maker, Creator, Timeworks DTP, MasterPlan, Grafix. Features: Transputers, Music, interviews, with Pete Johnson and CRL, Adventures. Listings: Dynamic relaxation, Mouse designer, prime numbers.

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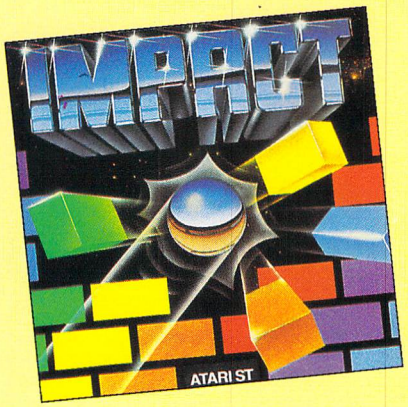

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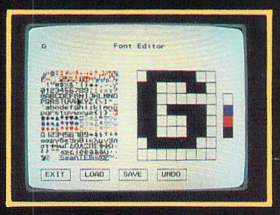

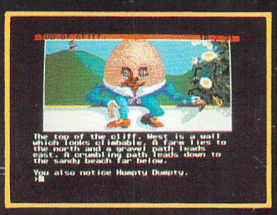

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