

# ATARI ST USER

The  
top-selling  
Atari ST  
magazine

Volume 3  
Number 3  
May 1988  
£1.75

## TRANSPUTER

The Abaq road to  
supercomputing

## PROGRAMMING

Create your own  
personal cursor

How to model  
tensile structures

## ST MUSIC

The future is here  
— and it's great!

## REVIEWS

**BUSINESS:** MasterPlan,  
Word Perfect, Partner,  
Timeworks DTP  
Certificate Maker

**GAMES:** Oids, Eye,  
Mission Elevator,  
Tetris, Test Drive,  
Crash Garrett, Wargame  
Construction Set,  
Terramex, Slaygor,  
Dungeon Master,  
Gunship, Warlock

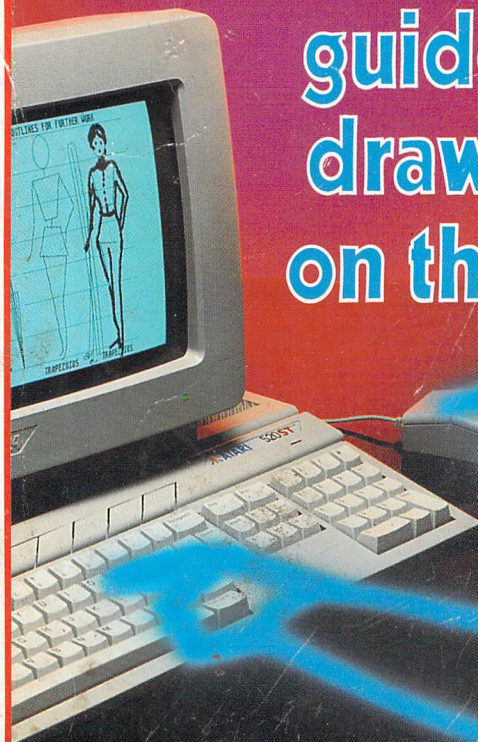
**UTILITIES:** Quick List,  
Mastermat, Creator

**ART:** Grafix

**LANGUAGES:** PD Forth,  
Gem Forth

Starts this month:

Complete  
guide to  
drawing  
on the ST



**LOTS OF FREE GIFTS!**  
Goodies galore  
for our new  
readers



PRODUCING A NEW DIMENSION IN MANAGEMENT DATABASE SYSTEMS

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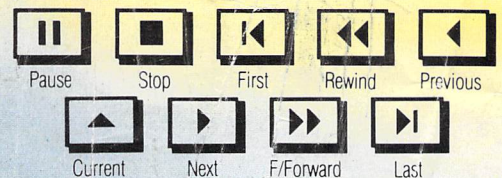
An integral text editor allows a mail merge interface to the database and the ability to link text files to records. The Superbase text editor allows you complete freedom to use any amount of text within your database files or can be used simply for your day to day correspondence and typing requirements. Superbase Professional can search any ASCII text file even if it wasn't created by Superbase.

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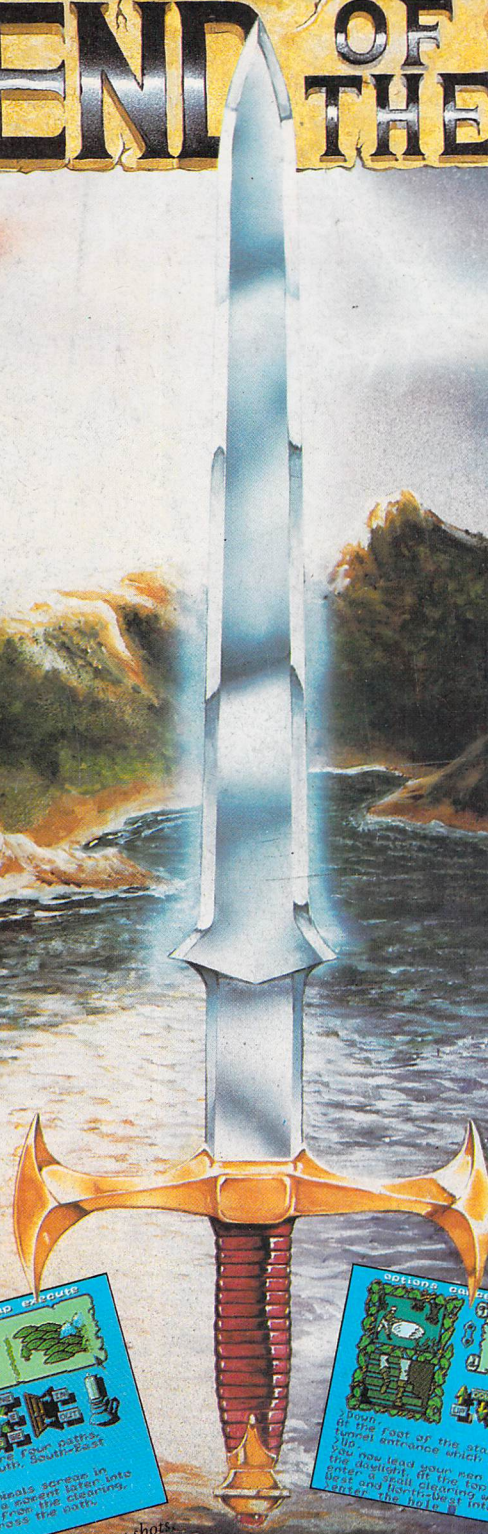
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# LEGEND OF THE SWORD



## THE LEGEND BEGINS

Battle with a rampaging  
of mutated humanoids to  
the land of Anar.

Under the command of the evil  
wizard Suzar these terrifying  
mutants have run wild,  
casting the land into  
fear and turmoil.

Only one  
thing can stop  
them — the  
warrior who  
can wield the  
legendary  
Sword and  
Shield of Anar.

Enter one  
brave warrior  
with one big  
problem. The  
fabled Sword  
and Shield  
are now  
part of  
folklore —  
their  
where-  
abouts  
unknown.  
With five  
valiant  
companions  
your task  
is to seek  
out the  
Sword  
and  
Shield.

A task so  
daunting it  
would freeze a lesser  
man's blood... a  
task that only you  
can handle.

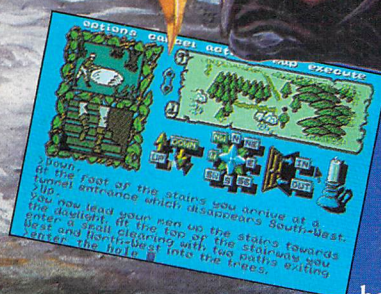
A compelling and  
humorous adventure  
which crosses the boundaries  
between role-playing games and  
standard text adventures.

**LEGEND OF THE SWORD —  
A CUT ABOVE THE REST.**

**Atari ST £24.95**



Atari ST screen shots



Legend of the Sword is available through all major Computer Games Retailers and by Mail Order. Simply complete the coupon and send it to: The Marketing Department, Telecom Soft, First Floor, 64-76 New Oxford Street, London WC1A 1PS.

Please send me the following:-

Machine	Product	Quantity	Total Price
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TOTAL			

Prices include postage and packaging to U.K. addresses.

Name ..... Address .....

Post Code .....

I enclose cheque/postal order for £..... made payable to British Telecom PLC.,  
or debit my Access/Visa Card No.

Expiry Date .....

Signature .....

Please allow up to 28 days for delivery from acceptance of order.

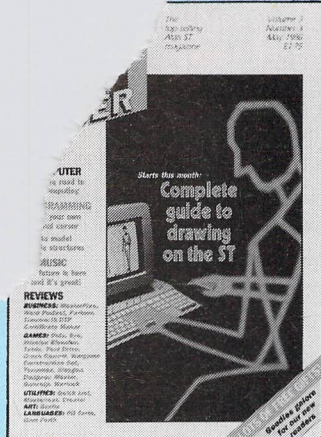
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**Managing Editor**  
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**Group Editor**  
**Alan McLachlan**

**Features Editor**  
**Roland Waddilove**

**Production Editor**  
**Peter Glover**

**Editorial Assistant**  
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**Advertisement Sales**  
**Nora Lawton**

**Reviews Coordinator**  
**Pam Turnbull**

**Promotions Editor**  
**Christopher Payne**

**News Editor**  
**Mike Cowley**

**Tel:** 0625 878888 (All depts)  
0625 879940 (Subscriptions)

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## FEATURES

### News

All the latest stories and events from the ever-expanding world of the Atari ST, including the latest Gallup chart of top-selling games software.

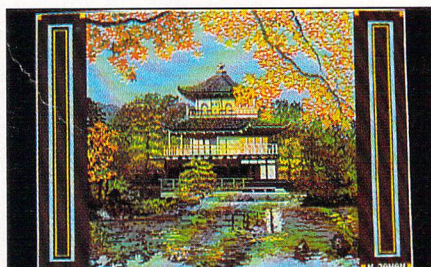
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### Transputer

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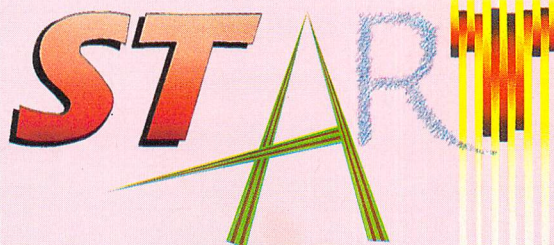
The pages you write yourselves. A selection from our bulging mailbag.

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### Music on the ST

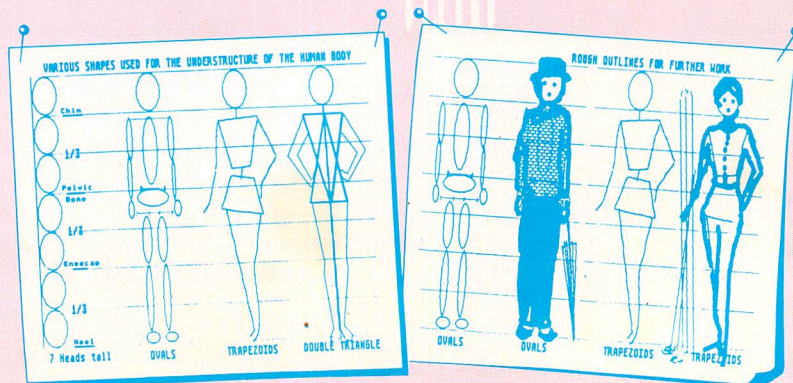
An interview with Rob Hubbard, plus a review of Intelligent Music's M.

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The start of a new series revealing the different drawing techniques used by computer artists.

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## REVIEWS

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Forth is fast becoming an increasingly popular language for programmers needing speed and flexibility. We assess a Gem implementation for the ST that provides all this, and more.

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How good are the public domain versions of the Forth language? We find out.

**25**

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**40**

### Quick-List

This very handy utility will help you keep track of your discs. And you'll find it won't break the bank either.

**53**

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A package enabling you to create a multitude of customised certificates comes under the ST microscope.

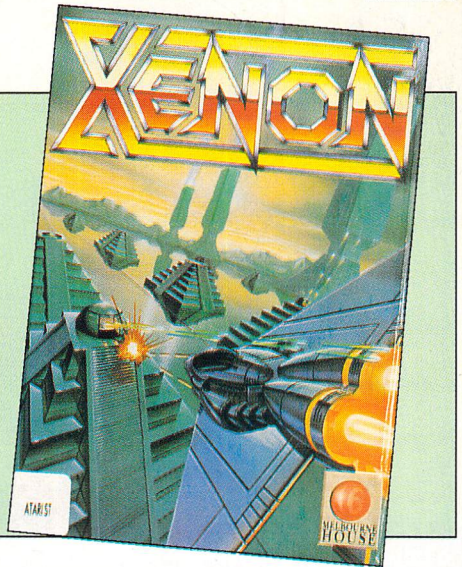
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A full review of this fantastic arcade game. We ask: Is it really the ultimate shoot-'em-up?

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A pack of fun, educational games for young children is fully investigated.

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This popular desktop publishing package has now been updated. We report on all the changes made.

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Do you need a powerful and flexible spreadsheet? This could be just what you've always been looking for.

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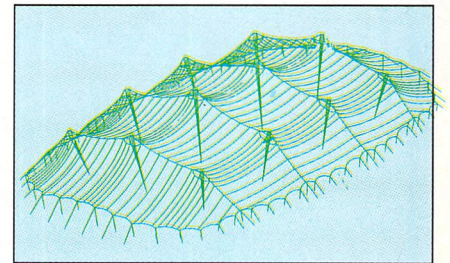
### Grafix

A budget-priced drawing package in monochrome is evaluated in depth.

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### Dynamic Relaxation



An intriguing program showing ways in which micros can be used for modelling complex tensile structures.

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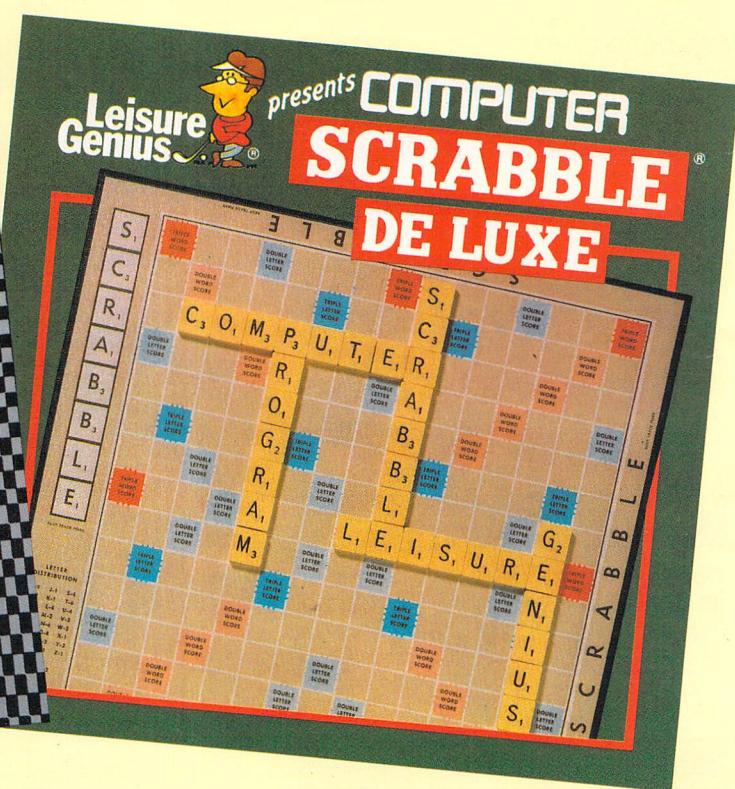
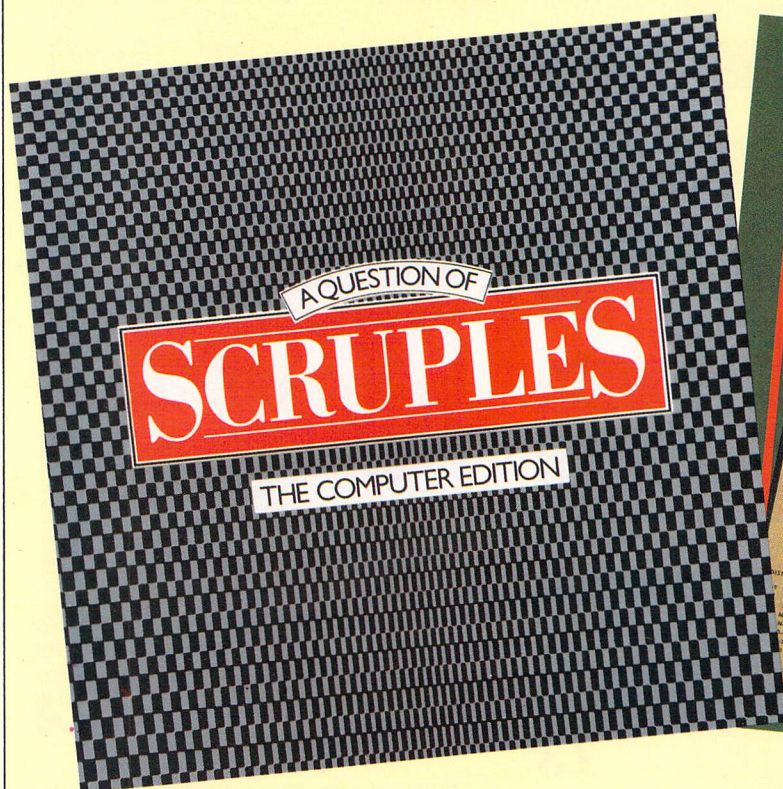
Could this be the ultimate prime number generator? We test for a million numbers in under four seconds.

**91**





# Leisure Genius



## ST GENIUS

You don't have to be a genius to play our games, but most people who do can boast superior intelligence!

Now ST owners can enjoy our superb computer implementations of these well-known games, greatly enhanced to exploit the ST's superior capabilities.

*Scrabble De Luxe® runs on all Atari ST's  
and Scruples® on all colour Atari ST's. £19.95*

Leisure Genius, 2/4 Vernon Yard, Portobello Road, London W11 2DX.



# Atari drives in to IBM's empire

**ATARI is squaring up firmly to IBM's hold on the personal computer market with a new range of machines offering compatibility plus enhanced features at lower costs.**

The PC2 range is claimed to have the power, speed and graphics capabilities of machines at many times the price.

Three configurations are already available, all based around an 8088 micro-processor and offering switchable clock speed of 8Mhz or 4.77Mhz.

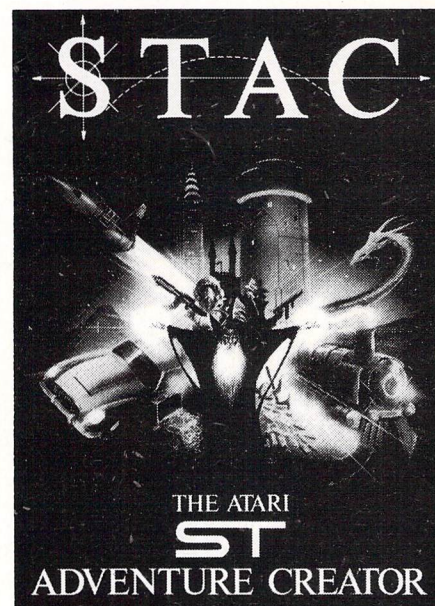
All three packages feature 512k ram, expandable to 640k, EGA, CGA, Hercules

and standard monochrome graphics and a monochrome monitor.

The PC2 SD – with single 360k floppy drive – is aimed at the businessman who needs a low-cost entry for tasks such as word processing. The PC2 DD, with dual 5.25 floppy drives, is intended to meet more serious business requirements. Prices £689.99 and £747.49 respectively.

The top of the range PC2 HD offers a single floppy disc for program loading and a 30Mb hard disc capable of storing up to 7490 A4 pages of information.

Price £1092.49



## Lap or not?

RUMOURS about a new ST laptop still abound despite strong denials from Atari. Industry sources in America are pointing to the recent promotion of one of its top communications men – Neil Harris – to the post of sales manager, as being a direct result of intense media interest in the possible new machine.

Despite the denials, it is rumoured that Shiraz Shivji of Atari's development team has had talks with Perihelion Software about developing an operating system for the new laptop.

Perihelion worked closely with Atari on the development of its Abaq computer so a tie up with another project would seem a logical step.

However, as always, spokesmen from both companies are denying that the machine even exists. Time will tell.

## Sales double

**ATARI Corporation's computer activities continue to prosper. The company has just announced net sales of \$147.5 million for the last quarter – up 59 per cent from the previous year's \$92.6 million. Income was 53 per cent up at \$31.3 million.**

**Net sales for the year stand at a record \$363.8 million – a rise of 41 per cent over the previous year.**

**Income for the 12-month period was up 49 per cent at \$72 million.**

**Atari president Sam Tramiel said: "The computer segment of our business continued to grow at a record pace, contributing over 51 per cent to our net sales for the year".**

## New road to adventure

ADVENTURERS with a DIY bent have finally got a tool with which to translate their ideas into reality. The ST Adventure Creator – Stac – from Incentive Software (07356 77288) was written specifically for the ST series.

Incentive claims that Stac will allow users to write professional adventure games with ease.

Just enter the relevant data about locations, vocabulary and so on, add instructions for how the adventure is to behave – and watch your masterpiece run.

Full colour pictures can be created via the powerful built-in editor, or imported. And pictures are stored in compressed format to make maximum use of memory. Price £39.95.

## NEW MODELS COVER MICRO MARKET

THE European division of Atari announced a wide range of new products at the recent Hanover Fair which will give the company a machine in just about every sector of the micro market.

Unveiled at the Atari stand was a working model of the Abaq transputer-based micro, with representatives from the Cambridge Company, Perihelion, demonstrating its operating system Helios currently being developed for the transputer.

Abaq runs on the Inmos T800 transputer chip, making the machine more than 10 times faster than the PCAT.

Up to 10 transputer boards can be attached on the main board within the

machine and Helios will utilise this facility to give Abaq vast potential in the multi-processing and multi-user applications.

The Abaq will comprise a transputer hooked up to an Atari Mega ST with Helios, Windows and the Gem VDI driver.

Provision for three expansion cards is included: This can provide up to 64Mb of addressable dram or graphics cards for specialised applications.

Atari hopes to make Abaq available later this year, while Perihelion says that Helios is virtually finished. We are still waiting, however, for a price announcement.

The Atari PC range now includes 286

and 386 based machines to add to the compatibles launched last year. Again, these should be made available later this year – processor supplies willing.

Not on Atari's main stand, but shown to trade representatives, was the 68030 workstation.

This machine, based on the latest in the Motorola 68000 chip family, is designed as a Unix system, and according to Atari's Sam Tramiel, is a stage in the company's scheme to make Unix available to the consumer – the individual rather than the corporate buyer.

Tramiel says that it should be available (either late this year or early next year) at "well under \$5,000".



## Show's the spot for big savings

EXHIBITORS are forecasting record savings on hardware and software at this month's Atari User Show.

It takes place from April 22 to 24 at Alexandra Palace, London. A survey conducted by *Atari User* reveals that potential savings to visitors should total well in excess of £100,000.

The event will also be the launching pad for a number of exciting new Atari ST products.

Evesham Micros will be releasing its new disc backup program - Dissector, price £24.95 - as well as launching a new 1Mb drive for just £99.95.

Kuma has a host of new products that will be seen for the first time at the show. The new packages include K Index, an indexing utility for word processors, K Expert, a systems generator, K Scope, a hardware interface with software to turn the ST into an oscilloscope.

Kuma will also be relaunching its K Spread spreadsheet program at the reduced price of £29.95.

Seen at the show for the first time will be the new quality games publisher Mandarin Software which will be giving

demonstrations of its latest games for the ST - Time and Magik and Starquake.

The move to the larger exhibition space provided by Alexandra Palace further emphasises the increasing popularity of Atari's products.

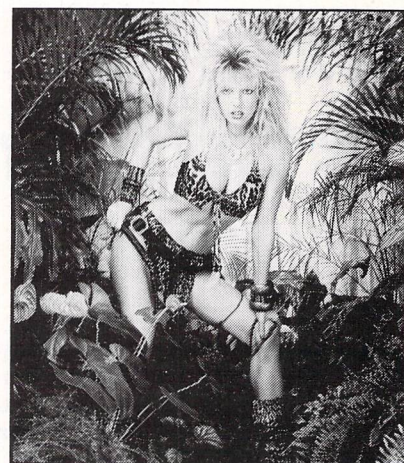
Previous venues have proven too small for the ever-increasing numbers of exhibitors and visitors.

One of the many special attractions to be seen in the West Hall will be the games arcade. A large bank of machines will be available for playing the very latest titles from leading software houses.

Centre stage at the show will be leading Atari dealer Silica Distribution with a massive 66 square metre stand.

Silica will be displaying the UK's largest ever range of software and hardware at the show. The company is also offering free registration to its Atari user groups.

So whatever your interests there will be lots to see, do and buy at the Atari User Show.



### VIXEN VERSUS DINOSAURS

A PARALLEL planet to Earth where dinosaurs still roam forms the colourful setting for Vixen, the latest Atari ST release from Martech (0323 768456).

Armed with a magic whip and the ability to turn into a fox, the lone heroine has to battle many reptile foes in this sideways scrolling arcade game.

Price £19.99.

## Chipping away at the profits

UNDER the Tramiel management Atari has consistently cut production costs as far as possible and pared its own margins, so that the announcement of prices for its advanced machines usually has the effect of making people gasp.

This is excellent for the consumer and it works for Atari too when the market is buoyant and supply of components is plentiful. But it does make the company very vulnerable to fluctuations in chip costs.

It is this which has forced Atari to raise the prices of its ST range of machines. The price of 256k dynamic ram (dram) chips which are used across the ST range has risen 150 per cent over the last year or so, from about \$1.50 to \$3.75.

Sources for these chips have been companies in both the States and Japan, with the Japanese firms consistently undercutting prices from American companies.

In order to protect its own firms, the US entered into a trade agreement with Japan which effectively got a minimum price on the chips and restraints on the amounts manufactured.

Now, as the Japanese companies are transferring their attention to manufacturing 1Mb rather than 256k

By Christine Erskine

dram chips, there is a shortage as opposed to a glut in supply.

Last month Atari announced that it could no longer absorb the financial difficulties that this presented and prices would have to go up across the board.

The machines most affected are the 520ST and 1040ST, which cost £100 more. An increase of £100 on a system costing over £1,000 in the first place isn't so noticeable, but a £100 hike on a £299 consumer/home user micro looks enormous. Suddenly the ST is no longer the great bargain that it was (especially when compared to the Commodore Amiga).

Atari reckons that coming into summer, when fewer STs would have been bought anyway, the loss of sales will not be as drastic as it would have been in peak selling time - the run-up to Christmas.

Certainly, it makes more sense to take a deep breath and raise prices now than try to hang on throughout the summer and then be faced with no choice but to add £100 in September.

The company also claims that the

increase of £100 gives it room to include in the ST package up to £500 worth of software for new promotional offers which are due to start at the end of April.

Two packs will be offered on the 520ST: The business suite of word processor, database and spreadsheet and a second package comprising games.

Atari UK reckons that the £399 package with £500 worth of software included will be perceived as better value for money than a straight price rise of £349 or £369 without any extra goodies.

Atari has been trying, for some months, to circumvent the problem by buying out a chip manufacturing company, "so that we are not subject to the whims of third party suppliers" according to one spokesman.

Certainly, this would steady both its supply and costs, so that future Atari pricings and price adjustments can be made with a longer term view of the market.

Should it succeed in this venture, of course, then there will be room for the price to come down again. Until then, it, and many other computer manufacturers will have to wait and hope that the component market can sort itself out.



*The phenomenal growth in demand for Atari computers means a much bigger home for the BIG show...*

# ATARI USER SHOW

Friday  
22  
April  
10am-6pm

Saturday  
23  
April  
10am-6pm

Sunday  
24  
April  
10am-4pm

**THREE action-packed days for Atari owners!**

The spectacular Alexandra Palace represents a new showcase for the fastest-growing range of computers on the market.

From the exciting games console to the ever-popular 8-bit Atari and the sensational Mega ST, they'll all be there at the Atari User Show!

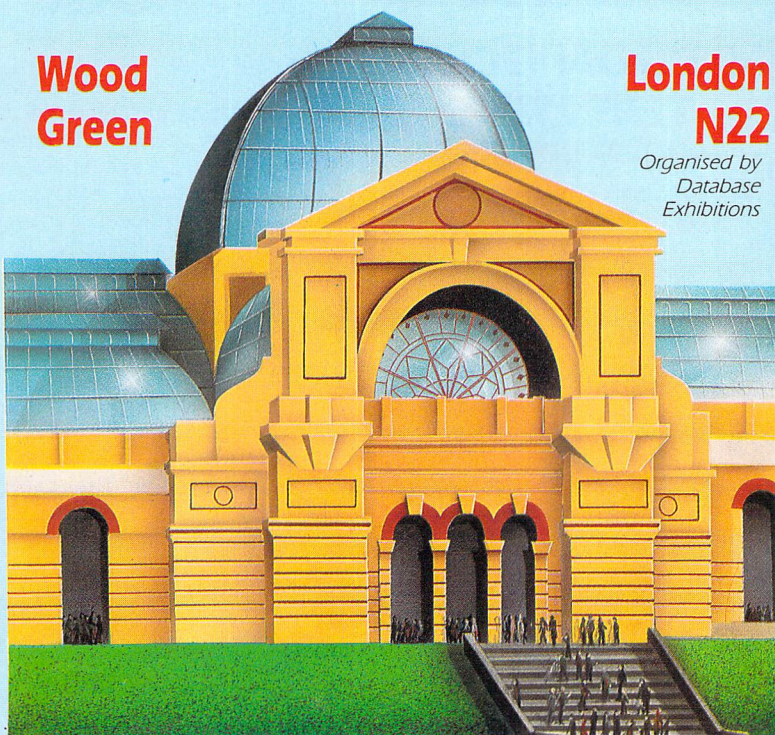
Some of the very latest software will be on show for the first time.

## Alexandra Palace

Wood  
Green

London  
N22

Organised by  
Database  
Exhibitions



And that means you can enjoy unique hands-on experience of programs everyone will soon be talking about.

You'll find some of the best prices around for blank discs, disc boxes and other accessories, learn about the many opportunities to expand your computer system, get helpful advice from some of Britain's leading experts, and so much more!

Bring this coupon to the Show to get 50p per person off the normal admission price of £3 (adults), £2 (children).



**ATARI  
USER  
SHOW**

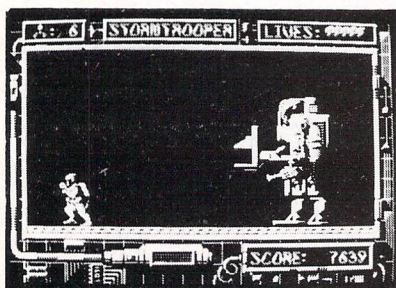
Friday, April 22, 10am-6pm  
Saturday, April 23, 10am-6pm  
Sunday, April 24, 10am-4pm

The West Hall, Alexandra Palace,  
Alexandra Park, Wood Green, London N22

### Exhibitors who have booked stands to date

A1 Computer Supplies	Evesham Micros	Micro Supplies
Adamsoft	Frontier Software	Miniature Tool Co
Advanced Systems & Techniques	Futuresoft	Mirrorsoft
A R Enterprises	Gollner Publishing	Monitor Magazine
Arnor	Gultronics	Page 6 Magazine
Atari User	Harlow Computer Centre	Palantir
Atari ST User	Hi Soft	Precision Software
Calisto Computers	Home & Business	Red Rat Software
Care Electronics	HSV Computer Services	Robtek
Centec Disk Supplies	JKL Computers	Signa Publishing Systems
CDS Software	Kuma	Silica Shop
Compumart	Llamasoft	Siren Software
Compunet	Mandarin Software	Software Express
Computer Bookshops	MCD	Start Systems
CPM	Metacomco	Tirith
Cut Price Software	Microdeal	Trowbridge
Dataphone	MicroLink	Trybridge
Direct Disk Supplies	Micro Media Computer Supplies	Tynesoft
Eidersoft	Micronet	Zonefour
Electric Distribution		





## MISSION DOWN THE MINE

A FUTURISTIC arcade adventure game for the ST has been released by Creation Software. Stormtrooper is set in the Halagenium mining complex TK21 which has been taken over by mercenaries.

The object of the mission is to terminate one of the most important geophysicists in the exploration for Halagenium who has defected to a foreign power.

Creation (0992 446553) says that Stormtrooper features horizontal and parallax scrolling, 16 levels of play and a multiple choice of weapons. Price £19.99

## Starquake updated

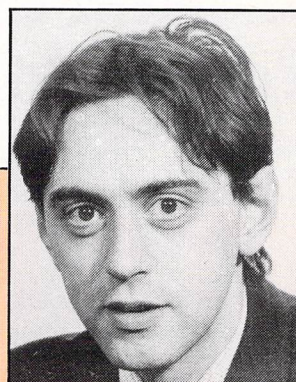
THE third title to be released under the new Mandarin Software label is Starquake for the Atari ST. A smash hit for leading games creator Bubble Bus on 8 bit micros, the addictive arcade game has been considerably enhanced by Mandarin for its ST debut.

There are spectacular, totally new graphics – plus digitised sound and special effects, including five different tunes. Also new are clever animated sprites and the ability to save high scores to disc.

There are 500 action-packed screens in the subterranean journey of BLOB – the Biologically-Operated Being – whose task is to collect objects needed to restabilise the planet's core.

Starquake is the latest joint venture combining the marketing muscle of the Europress Group with the talents of the UK's top programming teams. Previous releases include Time & Magik for the ST.

Designed by former Programmer-of-the-Year award winner Steve Crow, Starquake from Mandarin Software (0625 878888) costs £19.95.



## Starways star

SOFTWARE developer Logotron has appointed Herbert Wright to head its recreational products division. Formerly of Telecomsoft, he was closely linked with Firebird Software. During that time he published Elite and Sentinel, both titles winning the accolade of game of the year.

Herbert Wright will lead the team of programmers – Steve Cain and Graham Everett – that brought Star Trek to the ST. Currently they are working on a new space adventure called Starways.

# Gallup Software Chart

This month	Last month	Title (Software House)	Price	Month reviewed in Atari ST User	Comments	Marks from 10
1	•	BLACK LAMP <i>Rainbird</i>	19.95	April	Fast, fun and a very addictive arcade adventure.	9
2	•	XENON <i>Melbourne House</i>	19.99	May	This month's STar Game.	*
3	•	GUNSHIP <i>Microprose</i>	24.95	May	Latest release from Microprose seen this month.	*
4	4	UNIVERSAL MILITARY SIMULATOR <i>Rainbird</i>	24.95	March	Heralds the dawn of a new age in computer wargaming.	9
5	13	TEST DRIVE <i>Electronic Arts</i>	24.95	May	Our reviewers take this one for a spin in this issue.	*
6	9	STAR TREK <i>Firebird</i>	19.95	February	Game that belongs in every collection.	9
7	8	ENDURORACER <i>Activision</i>	19.95		Watch out for the Quick Peek in next month's issue.	*
8	•	DUNGEON MASTER <i>Mirrorsoft</i>	24.99	May	Read our comments on this new one this month.	*
9	3	STAR WARS <i>Domark</i>	19.95	January	If you never buy another arcade game – buy this one you won't be disappointed.	10
10	16	FOOTBALL MANAGER <i>Addictive</i>	14.95		Classic now available for the ST.	*



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**Francis Botto looks towards the future and reveals the latest in transputer technology**

# The shape of things to come

**T**O escape the transputer hype over the last couple of months you would have had to bury your head firmly beneath the sand of a remote beach in a secluded region of Tasmania.

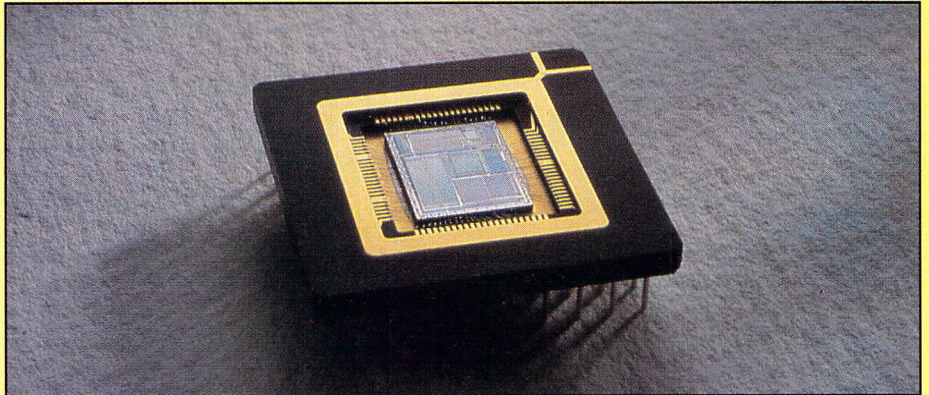
It seems everyone's gone transputer crazy, to the delight no doubt of Inmos, now wholly recovered from the ram doldrums it was unfortunately subjected to in those cruel years of 1984-85.

And the lesson to be learned from that story, namely don't put all your eggs in one basket, or to be more precise, don't put all your ram chips in the personal computer market, is about to be ignored, as once again Inmos looks set to develop yet another dependence on the personal computer industry.

This time however, it has a real stranglehold on the market – a monopoly in fact – with no competitors it seems it can't go wrong. All it needs do, is haul in profits from the naturally costly wonderchip, and then watch it settle to a tear-jerking price, ready to fend off chip manufacturers contemplating the development of a competitive single chip micro.

The race is now on to produce transputer-based machines which defy that serial micro architecture we've grown to love. The ST, believe it or not, like most other micros is a prime example.

Yes that serial of serial dilemmas, the von Neumann bottleneck, is about to be irradiated by the concurrent processing charms of the transputer – or so Inmos



*The Inmos transputer chip*

hopes. And as ever, it looks as if it's going to be left to Atari to lead the way with an affordable transputer-based machine.

Ironically, and to the dismay of journalists who'd already draughted their reports before their arrival at the Comdex show, Atari shook the computer world with an up-and-running transputer-based prototype called the Abaq – which we're told is short for Abacus, a name, incidentally, which is already being ridiculed.

Anyway, as was pointed out by Atari, it's no worse than Compaq – they're just jealous that's all. Atari unveiled more far-reaching plans than anyone had anticipated, namely the development of a personal supercomputer.

So far however, the Abaq is an extremely raw prototype. As such, the

eventual machine is still shrouded in an almost irritating mystique – nevertheless, we have the latest up-to-date inside knowledge which we'll talk about shortly.

What's a transputer? Apart from being a complete micro on a single chip, the transputer is basically a parallel processor.

Unlike conventional processors, which in the main operate in a serial fashion, a transputer network will implement processes literally in parallel – in other words at the same time. The transputer is therefore a concurrent device and consequently much faster.

You might argue, however, that your ST can do a number of things at a time. Yes it can, but this is done by multi-tasking the processor. Though hard to believe, the ST is still operating sequentially.

## The transputer solution

**I**N the early eighties, and possibly late seventies, it was realised that microcomputer architecture was in a damning rut. Greater speed meant the adoption of second and multiple microprocessors and concurrency seemed to evade the clutches of the ubiquitous microprocessor.

In answer to apparently insurmountable problems, manufacturers concentrated on ram, but most were fully aware that parallel processing was the real way ahead.

Initially, the search for parallel processing began with the conventional

microprocessor. Several solutions were achieved, but they were complex in terms of their construction.

In view of the obvious, and with added hindsight of the blind alley to which the microprocessor led, Inmos set about the development of a single-chip micro that could be interconnected in a truly concurrent vain.

In October 1985, at London's Institute of Contemporary Arts, the transputer was commercially born – a heck of a strange venue for it.

In retrospect though, it's hard to believe that shortly after the years

1984-85, when Inmos was up to its neck in unwanted ram chips, it still managed to finally develop and launch the transputer.

And though it can be proudly claimed that the transputer feat was achieved here in the UK – at Newport, Gwent – a lot of the groundwork was carried out Stateside. Nevertheless, the transputer is now becoming well-known as the British wonderchip, which can't be bad.

To date, in a personal computer environment the transputer-based machine has been available in one of two very distinct guises – as either an add-on or an add-in module. And more often than



not they have been development and sometimes evaluation type systems – in other words not the type of personal computer for the mass market.

However, personal supercomputers equipped with a network of transputers and capable of genuine parallel processing have appeared, where such delights as dynamic load balancing play a role.

This is the sharing of processing duty throughout a transputer network, as maximum speed may only be obtained providing processors are adequately occupied. Otherwise a parallel program will tend to run slower than an equivalent serial one. Inmos is currently researching this new and exotic computer phenomenon.

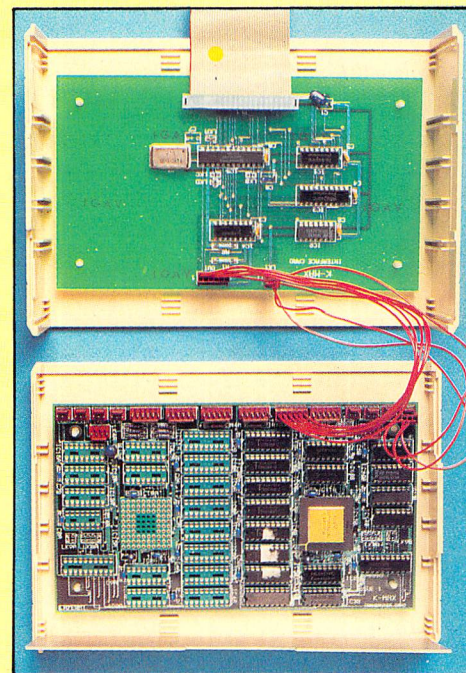
The first guise is assumed to fit into the natural process of technological evolution as a primitive first step. It seems a kind of metamorphosis is destined to take control, converting manufacturers of add-ons into full-blown makers of personal supercomputers.

Some companies are forecasting this transformation by the end of the eighties – no names mentioned.

Before Atari came on the scene, and bearing in mind the elaborate and expensive personal supercomputers developed by Meiko – which cost hundreds of STs – you might have been understandably sceptical about affordable personal supercomputers ever emerging, let alone by the end of this decade.

Your hopes must have risen though, when Atari announced plans to develop transputer-based machines. But the greater number of reports almost all drew a foregone conclusion, confidently announcing that the transputer-based Atari would be an add-on for the ST.

Many magazines dismissed Atari's transputer plans immediately, speaking of single transputer add-ons. As you now know, since the Comdex show many have had to eat their words.



Kuma's K-Max transputer add-on

## Atari's Abaq

**B**EFORE Atari told the world of its transputer plans, if you mentioned the merest syllable of the word transputer to them, you'd be discreetly told to go away. But now the cat has been out of the bag for some time, Atari is a bit more cooperative. With reports that there are Abaqs in British software houses as you read, the machine may soon arrive.

The Abaq looks set to be a flexible type system which can be configured to suit specific needs – largely according to the sort of processing power that's required. This personal supercomputer approach was in fact pioneered by Meiko, a company started by former Inmos technologists back in 1984.

It's now certain that the Abaq will be upgradable to support three cards, each containing four of the latest Inmos T800 transputers, each of which is capable of running at between 10 and 12 mips – or a million instructions per second.

This flexible approach will naturally lead to a supercomputer capable of being a business machine to hosting a complete network – such is the processing power of 12 T800s. In fact, Sam Tramiel, Atari president and son of Jack Tramiel, has recently

emphasised its business potential.

It needs to be said though, if you listened to all reports emanating from Atari, you wouldn't really know who the Abaq is aimed at. This leads us further to suspect a flexible system approach, the main reason probably being to keep up with the eventual drop in price of the T800.

Memory allocation looks set to be 1Mb of video ram and 4Mb of user/system ram – but this will be expandable no doubt, as it seems a bit meagre for the sort of processing power being offered.

Transputer graphics now in vogue will be fully exploited by a chip called Charity – and yes you've guessed it, it's another uncommitted logic array (or ULA).

That little ditty will provide four graphics modes – a super high-resolution 1,280 x 960 screen with 16 colours, which will no doubt be used for desktop publishing, image scanning and so on, a 1,024 x 768 screen with 256 colours, a 640 x 480 screen with 256 colours, and a 512 x 480 screen with 16 million colours – that should be quite enough for the games designers to be getting along with.

At present, the Abaq is not viewed

as being complementary to the ST, which in the main is true. But this may not be the whole picture, as Atari has announced that the Abaq's operating system Helios, now reported to have been completed by Perihelion Software, will be fully compatible with existing Atari operating systems.

Apart from the Abaq being able to emulate the ST, which is certain, it might mean that the ST can be used in conjunction with the Abaq – not ruling out the possibility of STs being used in networks configured around it. In that case though, the ST's role might be that of a dumb keyboard.

Estimates of the Abaq's price vary between £1,000 and £3,000. I think it really hinges on when the Abaq is launched. For example, the Inmos T800 isn't cheap at around £200 and is far from levelling-off at the £50 which Inmos hoped to achieve in two years.

In this case, if Atari manages to get the machine in the shops later this year – which is when it said first shipments would arrive – then the machine could well be around the £2,000 mark.

But if for some reason there is a delay – which there always is, particularly with something as innovative as the Abaq – then we could be looking at a basic Abaq at between £1,500 and £2,000.

If Atari leans it up, who knows they might even get it down to between £1,000 and £1,500, which is probably the target price after about two years or so.



# Blowing ST bubbles . . .

**C**OMPUTERS are mostly used for accounting and information processing, jobs previously done by people, but ones which computers can do much better.

I have always been more interested in the new fields that silicon technology has opened up; subjects that would be virtually impossible to explore without computers. The exploration of fractal sets is one such area, the design of tensile structures is another.

You may well have seen structures like the ones illustrated here used for marquees. These hi-tech creations were plainly not designed with the drawing board and T-square like many of the rectangular monoliths that dominate modern architecture.

They were in fact modelled inside the memory of a computer using a technique known as dynamic relaxation, which simulates the behaviour of a membrane under tension.

A tensile structure is, as its name suggests, a structure held in tension. A string stretched between two points is a tensile structure; so is the skin of a drum. In both cases the material used is flexible, but because it is held taught the structure becomes rigid.

An ideally constructed tensile structure is evenly stressed in all directions at every point. This means that no part is stretched more or less than any other allowing economical use of the fabric, unlike more conventional tents that require reinforcement wherever the canopy is subject to high loads – where the supporting poles and guy ropes meet the canopy.

Originally work on tensiles was done by modelling the structure in soap film. This may sound extraordinary but it does have a sound scientific basis. A soap film

**Charlie Dancey reveals how the ST can be used to replace soap bubbles when modelling very complex structures used in designing big tents**

will always assume an evenly stressed form – or burst – no matter how it is supported. This is because it has strength in tension, but at the same time it flows as a liquid.

When a soap film is supported by a circular wire frame, it assumes a flat shape like a drum skin. If the frame is bent into a curve in three dimensions the film takes on a new shape which has some interesting properties.

It is evenly stressed at all points and has saddle curvature at every point, that is to say it is neither purely convex nor concave, but both at the same time. This type of curvature is referred to as anticlastic (I mention this only because I particularly like the word).

Also, the film has formed a minimum surface; it has the least possible surface area that can be formed within the frame.

It has been shown mathematically that an evenly stressed film is always a minimum surface. It is also known that the calculation of a minimum surface by theoretical means is very complex and best achieved by a powerful parallel processing system.

The soap film is in itself a sort of parallel processor. Each molecule of the film is

located by the attractive forces of its neighbours, which are in turn attracted by their neighbours and so on until finally the shape of the resulting membrane is determined by the shape of the frame.

This soap film computer is very good at calculating minimum surfaces, but suffers from some serious disadvantages. It has very volatile data storage – it can burst at any moment – and the output is terrible – it is very difficult to take accurate measurements from a soap film.

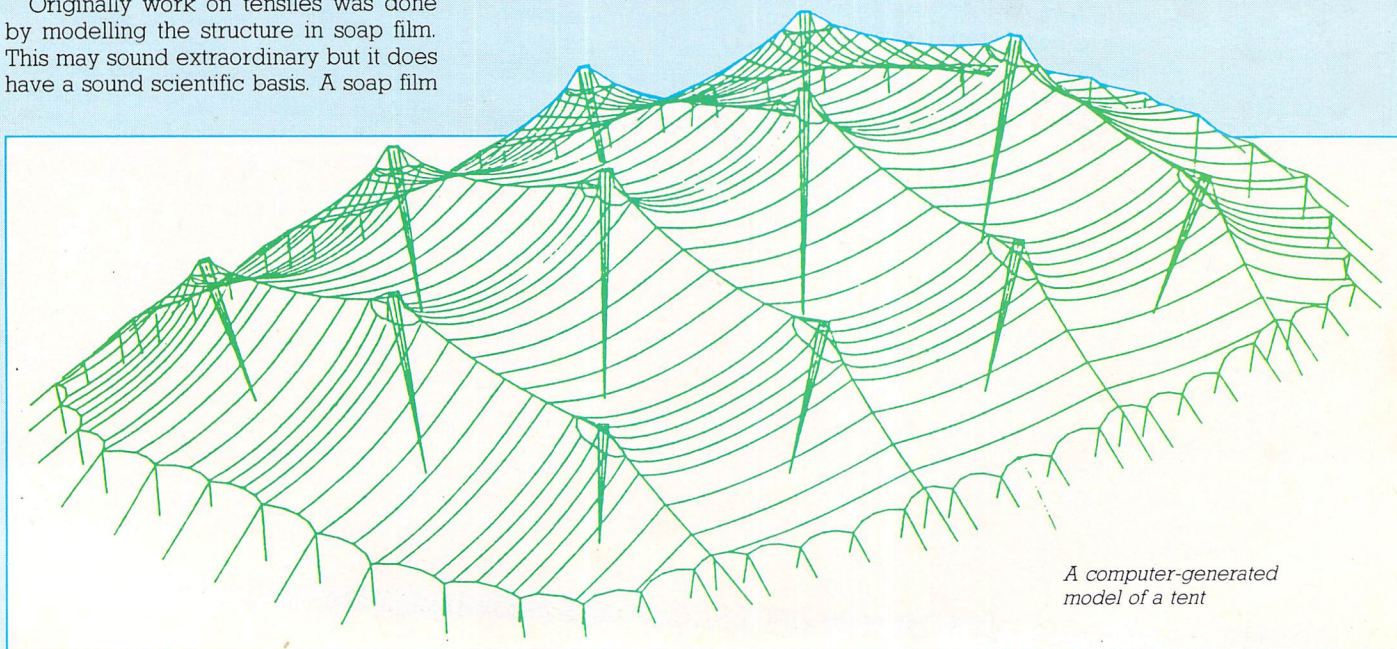
Despite these problems most of the early research into tensile structures in the 1950s was carried out using soap films. The researchers became expert at handling the membranes, which were sometimes over six feet across, and had to be maintained for hours in dust and draught-free environments. Measurements were taken using special photographic techniques.

For practical work a better means of calculating such shapes had to be found, and the micro has provided the solution.

I have produced a Fast Basic program that comes close to the soap film model. It uses dynamic relaxation to allow a grid to flow into a relaxed form in much the same way as an ideal tensile membrane.

Describing the membrane as relaxed is perhaps a little confusing, since it is actually under tension. The term relaxation really refers to a balancing of forces.

The membrane is modelled by a 20 by 20 grid of points connected by lines. Each point is stored as a set of X,Y,Z coordinates in appropriate arrays. At the start of the program the points are all given starting positions that correspond to a flat sheet in space. The middle point of the



*A computer-generated model of a tent*



grid is given a position to simulate a masthead.

Now the real work starts. The program sweeps through the whole grid repeatedly, adjusting the position of each point according to that of its neighbours, rather like the molecules in the soap film.

The adjustment is made very simply by giving each point the average coordinates of its four neighbours. This looks more complicated in the listing than it really is, so I will illustrate it simply as follows:

$$XP=(XN+XE+XS+XW)/4$$

In other words, the X coordinate of a given point is calculated as the X coordinates of its four neighbours (North, South, East and West) all added together and divided by four. The same calculation applies to the Y and Z coordinates. This is not applied to the mast head point or the corners, which are the only fixed points in the system – referred to as the system points.

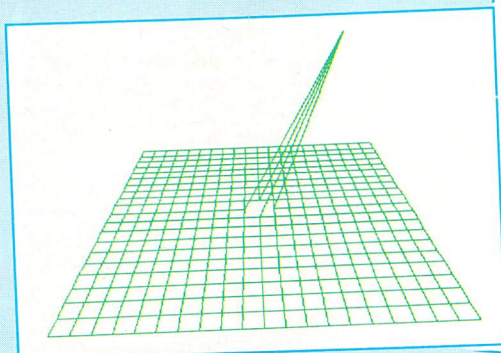
The location of the system points determines the final shape of the whole structure. The points along the edges require different treatment since they have only three neighbours each. It would be possible simply to average the three points again, but it is more useful to allow the edge to be under greater tension than the body of the canopy.

In the real world cables are often built into the edges of a tensile. To achieve this a variable *cable* is used. When *cable* is equal to one the three neighbours are merely averaged. When *cable* is equal to two, the edge tension is doubled and so on.

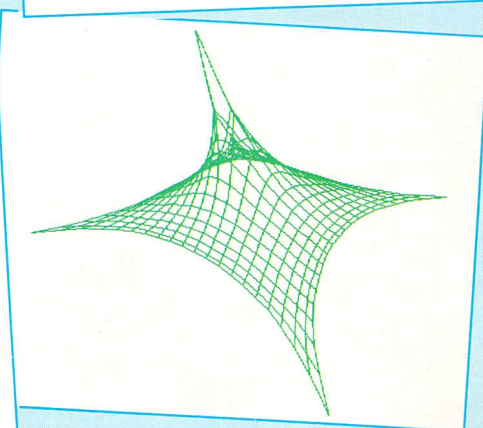
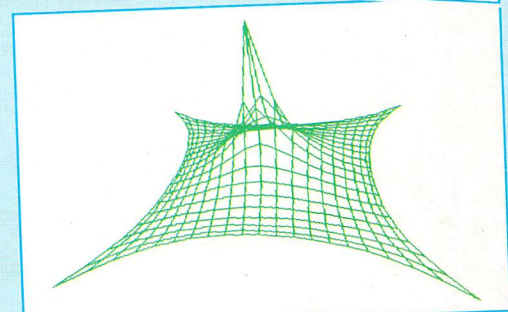
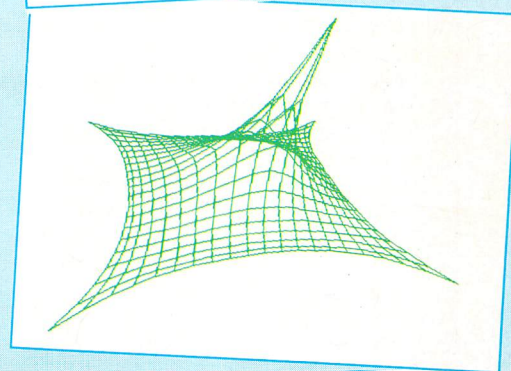
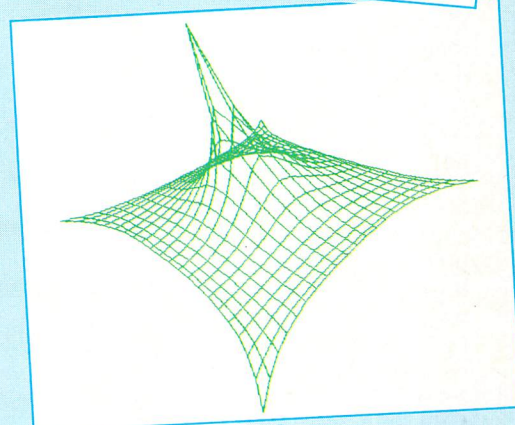
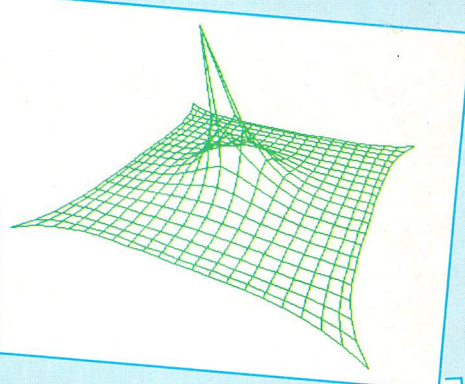
This variable can be altered from within the listing. Generally, the lower the value, the more the edges will sweep inwards.

It takes many sweeps of the program for the structure to settle down to a smooth shape. After each one the program draws a perspective view of the grid, allowing you to watch its progress. The image is also rotated a little between sweeps so that it can be viewed from all sides.

The technique used here is the same as that in the first of the wireframe



*Using dynamic relaxation to model a tensile structure*



graphics series (*Atari ST User* August 1987), rotation being achieved by incrementing the variable *u*, which represents rotation about the Y axis. The program could be adjusted to allow control over the viewing angle since provision has been made for rotation about any axis.

It is very rewarding to play around with tensiles in this way as they produce very attractive shapes on the screen. The program is intended as a starting point to work from.

More system points could be added by defining their starting positions and making sure that PROCrelax avoids them as it does for grid point 10,10 which is set up as the mast head.

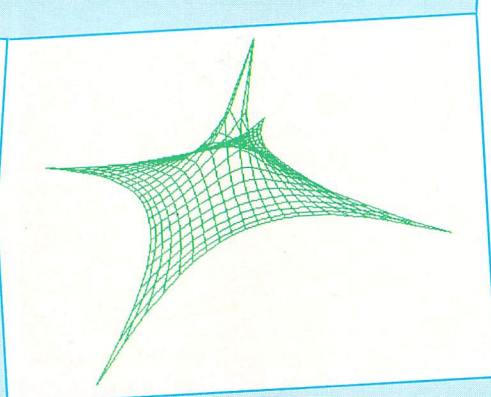
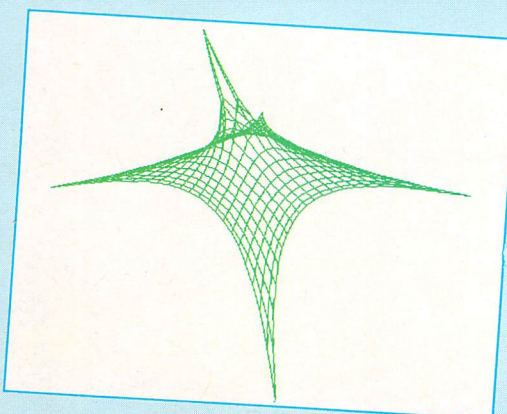
The edges need not be considered as cables, but could be fixed along their entire length – not necessarily in a straight line. More adventurous programmers could try working with triangular or even random meshes.

If you are adding more system points you will need to know that the origin is located in the centre of the grid and the points are spaced at 20 unit intervals in the listing as given. Moving the corners up and down also results in interesting shapes.

Note that the starting positions of non-system points are not important, and they will still move into the same final orientation. The only reason they are initialised in the listing is to give a tidy display.

The averaging technique used in this program results in an approximation of the minimum surface. Its advantage is that it is easy to program and relatively quick

**Turn to Page 16 ►**





## ◀ From Page 15

to run. More accurate algorithms are more complex.

If you look at the result of a few dozen sweeps of this program you will notice that the lines near the corners tend to be longer than the others. This is an indication of higher tension.

If you consider the grid to be a net of rubber bands connected together (which it models very closely indeed) then you will see why this must be so.

Dynamic relaxation is an iterative technique, and each sweep takes the model closer to the fully relaxed state. But it never quite gets there, rather like Achilles trying to catch up with the tortoise in the ancient paradox.

For practical applications a program like this would be allowed to run for many hours before data was read off from it. A

program of this type stores the grid as an array of coordinates to very high precision. The information can be extracted to generate accurate cutting patterns for the fabrication of a canopy in the real world.

It is also possible to use the data to generate flat printouts of strips taken across the grid which can be cut out and pasted together into paper models of the tensile.

The particular tent shown as a computer drawing was designed by Buro Happold, a firm of consulting engineers which specialises in this type of work. It is a transportable tent measuring 95 by 130 metres, making it the largest mobile tent in the world. The relaxation of the structure and the drawing were produced on a Hewlett Packard HP 9000 Workstation.

The most notable difference between the drawing and the output of our small

Basic program is the use of a triangular mesh. Buro Happolds software is written to control the tension in the mesh, not to equalise tension in all directions but to optimise it to the fabric's properties.

The material used for this tent was about 10 per cent stronger in one direction than the other. They also, very cleverly, managed to force the grid into a form that would allow economical cutting of the cloth from the roll.

**Further reading . . .**

*Readers wanting to learn more about this fascinating topic should try to get hold of a copy of Tensile Structures by Frei Otto, (MIT Press ISBN 0 262 65005 3).*

*This book is an absolute goldmine of ideas and is profusely illustrated. It also deals with inflatable structures which are actually tensiles supported by air pressure as opposed to masts and guy ropes.*

```
\Dynamic Relaxation.
\By Charlie Dancey
\ (c) Atari ST User
\Written in Fast Basic
\Works in all Screen modes
```

```
PROCsetscreen
PROCcreatevariables
REPEAT
PROCrotate
PROCdraw
PROCrelax
count=count+1
u=u+0.2
UNTIL FALSE
END
```

```
\-----
\Procedure and Function Definitions
\-----
```

```
DEF PROCrelax
FOR i%=1 TO 19
FOR j%=1 TO 19
IF i%=10 AND j%=10 THEN
\Do nothing this is mast top.
ELSE
\Average coordinates of four neighbours
x(i%,j%)=(x(i%+1,j%)+x(i%-1,j%)+x(i%,j%+1)+x(i%,j%-1))/4
```

```
y(i%,j%)=(y(i%+1,j%)+y(i%-1,j%)+y(i%,j%+1)+y(i%,j%-1))/4
z(i%,j%)=(z(i%+1,j%)+z(i%-1,j%)+z(i%,j%+1)+z(i%,j%-1))/4
ENDIF
NEXT j%
NEXT i%
\Now relax edges
FOR i%=1 TO 19
x(i%,0)=FNedgecalc(x(i%,1),x(i%-1,0),x(i%+1,0))
x(i%,20)=FNedgecalc(x(i%,19),x(i%-1,20),x(i%+1,20))
y(i%,0)=FNedgecalc(y(i%,1),y(i%-1,0),y(i%+1,0))
y(i%,20)=FNedgecalc(y(i%,19),y(i%-1,20),y(i%+1,20))
z(i%,0)=FNedgecalc(z(i%,1),z(i%-1,0),z(i%+1,0))
z(i%,20)=FNedgecalc(z(i%,19),z(i%-1,20),z(i%+1,20))
NEXT i%
FOR j%= 1 TO 19
x(0,j%)=FNedgecalc(x(1,j%),x(0,j%-1),x(0,j%+1))
x(20,j%)=FNedgecalc(x(19,j%),x(20,j%-1),x(20,j%+1))
y(0,j%)=FNedgecalc(y(1,j%),y(0,j%-1),y(0,j%+1))
y(20,j%)=FNedgecalc(y(19,j%),y(20,j%-1),y(20,j%+1))
z(0,j%)=FNedgecalc(z(1,j%),z(0,j%-1),z(0,j%+1))
z(20,j%)=FNedgecalc(z(19,j%),z(20,j%-1),z(20,j%+1))
NEXT j%
ENDPROC
```

```
DEF FNedgecalc(a,b,c)
=(a+cable*b+cable*c)/(2*cable+1)
```

```
DEF PROCdraw
CLG 0
HOME
PRINT count;" Sweeps"
FOR i% = 0 TO 20
FOR j% = 0 TO 19
LINE a(i%,j%),b(i%,j%) TO a(i%,j%+1),b(i%,j%+1)
NEXT j%
NEXT i%
```

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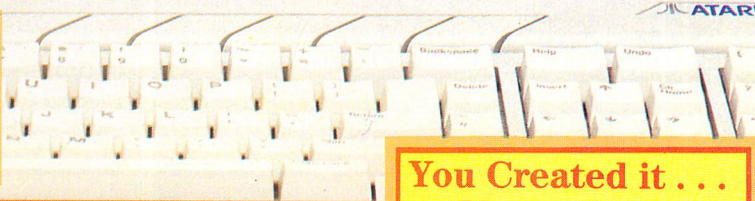
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## ◀ From Page 16

```

FOR j%= 0 TO 20
FOR i% = 0 TO 19
LINE a(i%,j%),b(i%,j%) TO a(i%+1,j%),b(i%+1,j%)
NEXT i%
NEXT j%
ENDPROC

```

```

DEF PROCcreatevariables
DIM x(20,20),y(20,20),z(20,20),a(20,20),b(20,20)
FOR i%=0 TO 20
FOR j%= 0 TO 20
x(i%,j%)=i%*20-200
z(i%,j%)=j%*20-200
y(i%,j%)=0
NEXT j%
NEXT i%
\set mast top.
y(10,10)=-200:x(10,10)=100
\miscellaneous variables.
DATA PI/6,0,0,150,400,3,0
READ t,u,v,viewdepth,viewdist,cable,count
ENDPROC

```

```

DEF PROCsetscreen
HIDEMOUSE
GRAFRECT 0,0,SCREENWIDTH,SCREENHEIGHT
TXTRECT 0,0,SCREENWIDTH,SCREENHEIGHT
CLG 0
HOME
PRINT "Dynamic relaxation - initialising"
\Set scaling factors according to screen resolution
SWITCH SCREENMODE
CASE 0: ascale=0.5:bscale=0.5
CASE 1: ascale=1:bscale=0.5

```

```

CASE 2: ascale=1:bscale=1
ENDSWITCH
ENDPROC

```

```

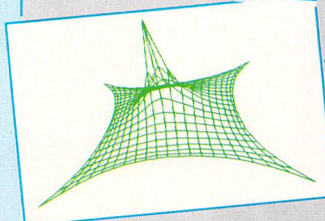
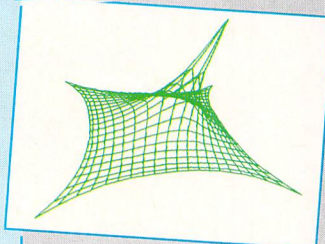
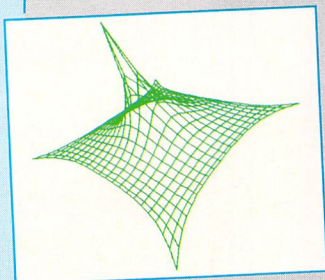
DEF PROCrotate
st=SIN t:ct=cos t
su=SIN u:cu=cos u
sv=SIN v:cv=cos v
FOR i%=0 TO 20
FOR j%=0 TO 20
x=x(i%,j%)
y=y(i%,j%)
z=z(i%,j%)
PROCrotcalc
a(i%,j%)=a*ascale+GRAFWIDTH/2
b(i%,j%)=b*bscale+GRAFHEIGHT/2
NEXT j%
NEXT i%
ENDPROC

```

```

DEF PROCrotcalc
\rotate on y axis
temp=x*cu-z*su
z=z*cu+x*su
x=temp
\rotate on x axis
temp=y*ct+z*st
z=z*ct-y*st
y=temp
\rotate on z axis
temp=x*cv-y*sv
y=y*cv+x*sv
x=temp
\perspective
a=(viewdist*x)/(viewdist+viewdepth-z)
b=(viewdist*y)/(viewdist

```



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## WHAT IS FORTH?

The essence of good Forth programming is to split a problem into small manageable portions and build up a program that can be easily tested and modified. Each distinct portion is called a word, and these can be executed from the keyboard or from within a program simply by using their names.

Forth has the full range of loop constructs – DO-LOOP, BEGIN-AGAIN, BEGIN-UNTIL, BEGIN-WHILE-REPEAT – multiline decision commands – IF-ELSE-THEN – and the CASE structure.

When a new word is defined, it becomes part of the Forth dictionary and is indistinguishable from the words which are already there.

The programming environment is more like Basic than C. Forth can be used in immediate mode like Basic, but the program source statements are used to produce an executable form which can be processed quicker by the computer.

There are only three major dialects of Forth and most implementations adhere quite closely to one of the three standards. Since the language is so flexible, it is often feasible to make up for any slight differences between dialects or machine dependencies by re-defining some of the words.

Forth uses reverse Polish notation, but don't be put off by the rather strange looking syntax. At first everything looks back to front, but happily the notation used can be learned in a few hours and mastered in a matter of days.

Forth is remarkably versatile, since it combines all the advantages of a high level language with the speed and control normally associated with assembly language programming.

There is no separate linking stage to go through before an executable program is produced. The time taken to test a program, correct it and recompile is therefore much shorter and takes fewer steps than many languages.

The interactive environment which Forth provides speeds up the overall development time by allowing easy testing of the individual elements of a program.

# The versatile alternative...

## Robert Gear is quite forthright about the benefits of Gem Forth

GEM Forth was written by Micro-processor Engineering, a Southampton firm with an impressive range of products on offer. The system is supplied on one single sided unprotected disc and MPE says as many personal copies as necessary may be made for backup and security purposes. But it asks users to respect copyright and not to have more than one copy in use at a time.

The language is started from the desktop by double clicking on the GEMFORTH.PRg icon. The program file is just over 30k long. The editor and assembler are held in separate files as binary overlays which are loaded in by the system when required, so they don't take up valuable memory space in a finished application.

Once you have written your program you can produce a turnkey package which will load and run straight from the desktop. MPE says the resulting PRG file may be distributed without royalty on condition that the user is allowed no

access to the underlying system. This is a fair compromise intended to stop people from re-selling the Forth system.

The 225 page manual includes upgrades to the floating point and Gem extensions. It gives a quick introduction to the language, but does not attempt to teach Forth programming. A large chunk is given over to full descriptions of the actions of the words in the system. Both newcomers and experienced users will find the glossaries an invaluable reference.

Gem Forth is Forth-83 standard, with extensions to handle Gem, floating point arithmetic, assembly language and the ST operating system. However, the language itself doesn't use Gem, so don't expect to see windows and menus while you are programming.

The package is supplied with Fred – MPE's friendly editor – which is excellent. By convention, source code is edited in screens of 1k. This means that only one screen of your code is held in memory at a time; the different sections are shuffled in and out of ram when required.

Fred, a full screen editor, is a big improvement over the Fig-Forth line editor. It uses keyboard controls to access its functions and the list is quite extensive. I doubt that I have regularly

0 lines in the barrel

Using Screen File: FORTH.SCR

```
=====
1 | \ file transfer - receiving simply | fred v1.4
2 | decimal |
3 | : recv-block | \ block# -- | Scr: 3
4 | block 13 remout 1024 0 | \ trigger start
5 | do remin over i + c! loop | \ collect | IE
6 | drop update flush | \ close block | --
7 | ascii . emit ; | \ tell user
8 |
9 | : recv-blocks | \ #blks --
10 | 0 ?do i recv-block loop ;
11 |
12 | : add-blocks | \ start-blk #blks --
13 | bounds do i recv-block loop ;
14 |
15 | --> |
16 |
=====
```

search for ''

replace by ''

Fred the friendly editor at work



used as many as half of the functions in a year.

Fred incorporates a novel arrangement called the barrel, a sort of clipboard/holding buffer. This becomes invaluable once you get used to it, particularly when moving lines of code from one screen to another.

Lines of source can be copied to and from the barrel with simple keyboard controls and the entire contents can be rolled up and down to display the required line in the one line message area. There seems to be no limit to its size – apart from the amount of available memory. The barrel stretches to fit whatever you want to put in it.

I have found it useful for temporarily holding lines and as a way of copying short pieces of text, though its hard to keep track of any more than a dozen lines in the barrel at any one time.

My only gripe about the editor is the way it handles movement of screens around the source file. It only appears to be able to extend the length of the disc file by one screenful – 1k – at a time.

This limitation only becomes significant if the movement of screens would attempt to write past the physical end of the file. If you try to do this, the block move function gets muddled because it tries to move screenfuls of code on to screens which do not exist.

However, provided you know about it, this snag is not the end of the world. All you need to do is ensure the disc file is large enough to stop you from trying to move screens off the end.

Version 1.0 of Gem Forth had an annoying habit of crashing back to the desktop if an exception error occurred. The problem has been fixed in the latest update by trapping the exception vectors; and now an error message is given and control is returned to the interpreter.

Forth vocabularies are managed extremely flexibly. Unlike the older Fig implementations, Forth-83 can support complex vocabulary search orders. Older versions could only manage to search one context vocabulary plus the Forth vocabulary itself. Using the ONLY and ALSO words, search orders with up to eight distinct vocabularies can be set up.

Gem Forth is not what is known as a native system. Many implementations contain their own device drivers to handle the keyboard, mass storage and so on. This version makes full use of the ST's operating system. Source code is stored in named Gemdos files and the current one from which the compiler will read can be altered with USING.

Gem Forth does not provide multi-tasking as standard, but MPE tells me it intends to make it available as an extension in the future. This will be done either

through a Gemdos timer interrupt or through a software task scheduler.

Gem programming is heavy going in any language. Even so, I found it much easier to experiment using Forth than C. The reason is simple: Forth is an interactive environment. It is easy to try things out quickly and without fuss – as soon as a word is completed it can be compiled into the dictionary and tested.

If it doesn't work you re-load the editor, edit the word and recompile it – all in a matter of seconds. Your train of thought isn't broken by a lengthy wait, as it is when using a C compiler.

The full library of Gem functions is available through the Gem interface routines and the majority of common operations have been included in higher level definitions. These combine commonly used pieces of code which make it easier to get a Gem-based program up and running.

The only drawback to using Gem is the difference in syntax caused by the nature of Forth itself, so it will not be possible to type in programs from books without substantial modification. However, the general principles still hold good.

A resource editor is not supplied with the package although the full range of resource file functions are supported. If you are serious about writing Gem programs you will find it virtually impossible without some kind of utility.

Fortunately, assuming you can get hold of a resource editor, two courses of action are available. You can take the contents of the .H – header definitions – file produced by the resource editor and retype them at the start of your Forth source as constants.

Alternatively, by doing a bit of hacking, you can read the .H file and write Forth words to interpret the #DEFINE state-



ments and compile them as Forth constants.

No other graphic support is provided as standard. If you don't want to get involved in Gem graphics you will have to write your own interface to the ST's A-line routines. Fortunately, I have found this to be a fairly straightforward matter.

Forth does not support floating point arithmetic as standard. In most cases, floating point numbers are simply not needed and the extra overhead in execution time and memory space do not warrant their use.

For the rare occasions when they are essential, MPE has supplied the source code for a full set of operators. Floating point versions of all the familiar arithmetic operators are present, as well as trig, logical and stack functions.

Since the floating point package is supplied in source form, it is entirely reasonable for you to edit the functions

**Turn to Page 22 ►**

```
Running under GEM V0.19
Screen File: FORTH.SCR
Free dictionary space: 230752 bytes
```

```
ok
35 list
Screen 35
1 \ assembler example - CMOVE
2
3 asm                                \ load assembler
4
5 code cmove                         \ source dest count --
6 (a7)+ d0 l. move,                 \ get count
7 (a7)+ a0 l. movea, d7 a0 l. adda,  \ get dest address+base
8 (a7)+ a1 l. movea, d7 a1 l. adda,  \ get src. address+base
9 d0 l. tst,                         \ if anything to do
10 ne, if, begin, (a1)+ (a0)+ b. move, \ copy a byte
11                                     \ count down
12                                     \ until done
13                                     \
14 (a3) jmp, end-code                \ back to forth
15
16 unhook-asm                         \ release assembler
ok
```

Using the  
Forth  
assembler



# ◀ From Page 21

which you don't need from your finished application to save memory. However, you will need to take care that the definitions you are taking out are not used later by functions you want to keep in.

The assembler follows the normal Forth conventions and uses reverse Polish notation. This tends to make the code look a bit strange at first because the operators and data precede the instructions. Even so, MPE has done a very good job of making the assembler mnemonics as close as possible to the conventional form.

Owing to the interactive nature of Forth, I have done more useful work with this assembler than I have with other conventional ones.

In common with most other Forth packages, it is a macro-assembler and incorporates structures. Versions of Forth words are available for use in definitions - IF-ELSE-THEN, BEGIN-UNTIL, BEGIN-AGAIN, WHILE, REPEAT. The structures act in the same way as their high level counterparts by assembling branch

instructions to carry out their functions.

The assembler is loaded from disc as an overlay and it can be discarded when it is no longer required so it takes up no room in the finished program. It is possible to optimise the performance of a program written in high level Forth by re-writing some definitions in assembly language.

Alternatively, it is sometimes easier to do things in machine code than to mess about in Forth. If a definition involves complicated stack juggling, this can be an indication that the problem has been poorly defined or that recourse to assembler may help to sort things out.

In the manual, the 12 pages devoted to the assembler explain how to load it from disc and describe its two different modes of operation. The syntax used is illustrated and is compared to that used by conventional assemblers. But don't expect the manual to teach you 68000 assembly language.

There is some instruction on using the assembler with an example word written in assembly language. Even so, I found the section on using it a little sparse. A

few more examples would have been helpful to a newcomer. All the information is there, but I found a couple of tricky little matters took me some time to work out when a few lines of explanation would have provided the vital clue.

Gem Forth is a full implementation of 32 bit Forth-83. Since I discovered the language I haven't written more than five lines of Basic; and I would have no hesitation in advising anyone who wants to write their own programs to switch to Forth.

If you have only one disc drive and your C compiler keeps running out of disc space, try Forth. I ran this version on one single sided drive on a 520STM for six months without any serious problems with disc space. I have upgraded to two double sided drives since then, but that was nothing to do with Forth.

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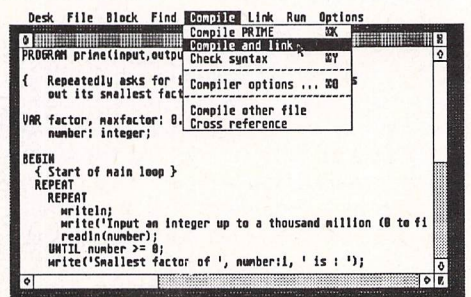
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**Windowing and graphics support** is provided by GEM; the documentation provides all the explanation needed to use these powerful functions.



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**F**ORTH has to one of my favourite programming languages. Unfortunately, the prices of commercially available Forth systems for the ST range from £50 to £250, and this has inevitably restricted the use of the language to all but the most dedicated enthusiasts.

I find this pricing rather strange, especially when you consider the fact that the design of Forth makes it ideally suited for implementation on the ST's 68000 processor.

As you might expect, this has inevitably led to the availability of a number of versions of Forth in the public domain. Of the three packages I looked at, only Volks Forth and Bradley Forth are really worthy of consideration.

There's also another, half finished version, which is often included on a general language disc along with a 68000 assembler and a variety of other system software. On startup it prints out the message "FORTH-83 Version 1 as of November 17 1985".

Despite having numerous copies of this program, obtained from various different sources, I have yet to get it working for longer than about five minutes on my ST without crashing completely. I strongly advise you to steer well clear of this program.

Volks Forth is a straightforward implementation of the latest 16 bit Forth 83 standard, enhanced with a number of special features to enable it to be used from within the Gem programming environment.

The system comes on two single sided discs. The first contains two different versions of the Forth interpreter, and the second a set of extensions and demonstration programs stored in the form of Forth screens.

Since this is a German program, I'm afraid I wasn't able to make much sense of the documentation. Familiarisation with the system was therefore rather a hit and miss affair.

Volks Forth stores all source programs using a series of screens which are compacted into one very large file on the data disc. Programs can be entered

# Ve haf ways of making you go Forth

**Stephen Hill finds a superb public domain programming language sure to get you hooked**

either directly from the keyboard or using one of the two screen editors provided. I couldn't in all fairness recommend either of these editors to a beginner, but they were certainly no worse than many others I've seen.

Unlike most Forth systems, the support for Gem provided by this package is pretty good and a comprehensive range of commands is included in the example screens. The main limitation with Volks Forth is that you are restricted to a maximum of 64k of program space, no matter how much memory is actually available.

Also, the package lacks a couple of the optional extras provided by the majority of commercial programs, such as floating point and double length arithmetic. It does however, sport a clumsy but serviceable 68000 assembler.

Rather than being the more common 16

bit Forth, Bradley Forth is an expanded 32 bit version, capable of dealing with full double length integers and programs as large as 230k on a standard ST.

This appears to be the maximum memory accessible by the system at the moment, but it may well be possible for users with more memory to reconfigure the program to take this into account.

In contrast to the previous program, the documentation was excellent. It was supplemented by an extremely powerful online help system, which gave a brief description of most Forth instructions at any time. Beginners would find this facility especially useful.

Instead of storing all source programs in separate Forth screens, Bradley Forth compiles routines directly from Ascii files on the disc. This enables you to readily use any text editor you like to create your programs. In addition, there is also a powerful version of the well known Emacs editor which can be accessed directly from Forth whenever necessary. A useful Emacs tutorial is supplied on the disc to get you started.

As with Volks Forth, there is no support for floating point arithmetic. In some applications this would undoubtedly be a serious drawback. Although a set of Gem functions is provided on the disc, these are described by the documentation as experimental, and I cannot attest to their total reliability.

Strictly speaking, this package is shareware. This means that support is available in the form of a full set of manuals, along with a copy of the latest version of the program for \$50 (about £30). Considering its quality, this has to be a good deal.

In many respects, the disparity between the design of these two versions of Forth makes it very difficult to make any hard and fast comparisons. Bradley Forth is undoubtedly the easiest to use, and makes the greatest use by far of the ST's resources. But Volks Forth has a better set of demo programs, and a simpler and more straightforward Gem interface.

For me, Bradley Forth wins hands down, but if you can cope with the German documentation, Volks Forth would also be well worth a look. With just a little more development work, neither of these implementations would look out of place among the many full priced Forth systems on the market.

So what are you waiting for? Get hold of a copy of Forth today. Who knows, you might even get hooked.

*All three versions of Forth can be obtained from the following public domain software libraries:*

McSoft, 9, Abingdon Gardens,  
Bath, Avon BA2 2UY.  
The South West Software Library,  
5 Barn Owl Way, Stoke Gifford,  
Bristol, Avon BS12 GRZ.  
The ST Club, PO Box 136, London  
E1 1LL.

## Get/Set the date and time on a file

only forth system also forth hidden also forth definitions

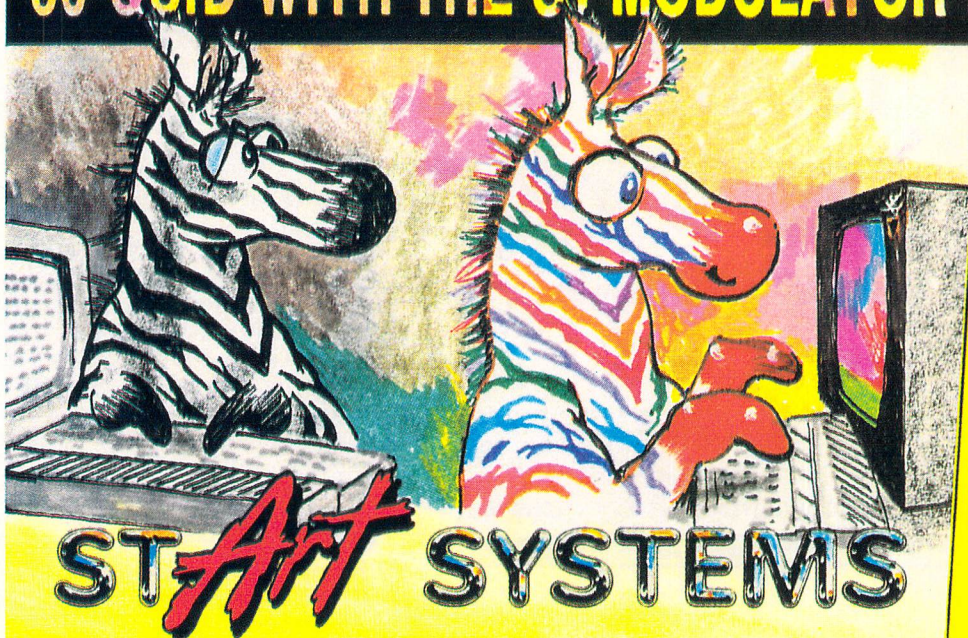
create datebuf 2 /M\* allot

```
:>buf ( s m h d m y -- )
  day> datebuf mal+ M! hms> datebuf M!
;
: buf> ( -- s m h d m y )
  datebuf M@>hms datebuf mal+ M@>day
;
: set-date&time ( sec min hour day mon year filename -- )
  >r>buf r>
  0 swap f_open dup 0< abort" Can't open file" ( handle )
  1 over datebuf f_dateime ( handle )
  f_close drop
;
: get-date&time ( filename -- sec min hour day mon year )
  0 swap f_open dup 0< abort" Can't open file" ( handle )
  0 over datebuf f_dateime ( handle )
  f_close drop
  buf>
-- ForthEMACS -- filedate.fth -- File: \files.fth\filedate.fth -----
[Read 31 lines]
```

Using Emacs  
to edit a  
Bradley  
Forth file



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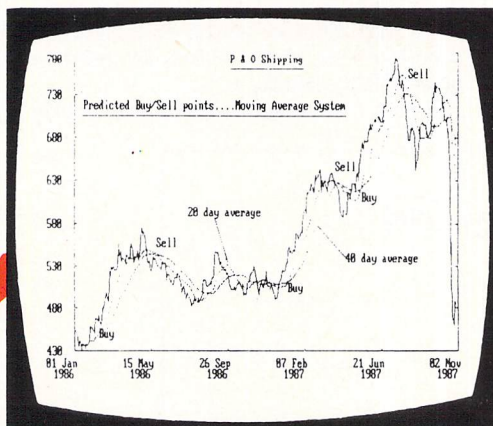
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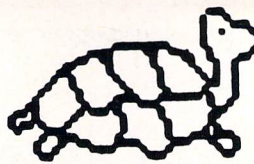


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**D**ESK accessories are the unsung heroes of the ST computer. Even the best programs can be made more convenient and practical when enhanced by an appropriate selection of useful accessories.

Because the ST only allows a maximum of six resident in memory at any one time, compilations consisting of several accessories inside a convenient shell filling only one desk accessory slot, are worth their weight in gold.

Large compilations are no longer the novelty they once were. Many feature calculators, notebooks, memo pads, address books, phone logs, diaries, calendars, clocks, alarms, printer configurations and other handy utilities – all crammed into one convenient program shell.

Among the many choices available are the cartridge based Backpack or Cornerman, ST Doctor, Fast, Maxpack, Macro Manager and even the competent public domain titles Side-Click, Goodies and System.

The latest addition to this array of desk accessory compilations is Partner by Timeworks, the company which produces the powerful word processor Wordwriter 2.0, as well as a competent database, spreadsheet and desktop publishing program.

In addition to featuring the main program, it includes two separate desk accessories, a thesaurus and a breakout game.

The first desk accessory on the compilation is an Address and Phone Book. It is a mini database skilfully designed as an index file and it keeps track of important names, addresses, phone numbers and miscellaneous comments in pre-defined fields.

As in most proficient databases, you

# COMPUTING WITH A NEW PARTNER

**Elliot Stein reviews  
a host of useful desk  
accessories in one neat  
easy-to-use package**

may open an old data file, create new ones, save them to disc, add entries, search and replace, or even print out address labels.

The ease of operation is obviously a lesson in simplicity learned from Data Manager, Timeworks' popular database program. Editing files are conveniently controlled by the mouse or with the arrow keys and Tab.

It will even dial a telephone number from the address file for those who have an auto-dial modem attached to their STs.

The next feature on Partner is Alarms, which may be set to sound any time your computer is on. When the alarm sounds a dialogue box containing a message appears over whatever program is currently running. It's an especially useful device for those with battery backed clock add-ons for the ST.

The Memo Pad is more advanced than many other similar desk accessories and is more of a small memory-resident word

processor than memo pad. It is the perfect tool for note taking or reading and editing Ascii text files and word processing documents.

If you've previously used any other word processor for the ST then getting the hang of this one should be no problem thanks to its simple and concise operation. Full WP editing features are included – cutting and pasting lines, insert mode on and off, swift page scrolling, word search, printout, printer set-up, and others.

Since all the files are saved in Ascii form, any work can be easily modified to work on most ST word processors.

Also included in the Memo Pad is a typewriter mode which allows the printer to instantly output each line as you type – just like a real typewriter.

There's also Vital Statistics, a collection of six reference files which can be accessed or altered through the Memo Pad – US area codes, holidays, toll-free numbers, weights and measures, metric equivalents and distances between major cities. Other files, such as an Ascii table, can easily be created.

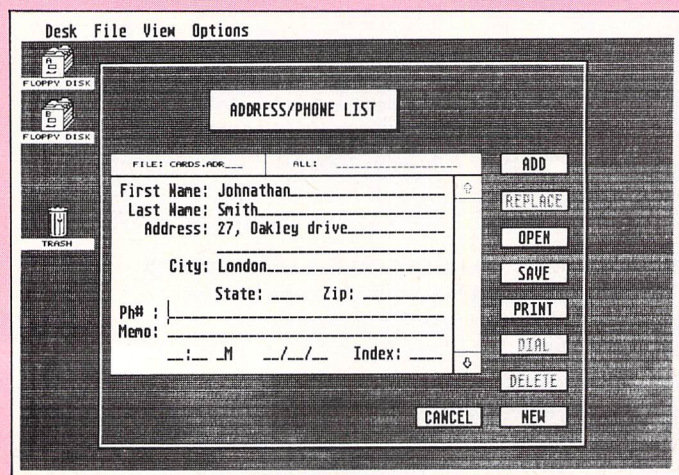
It's evident that Timeworks has taken many of the successful features of Wordwriter 2.60 and used them to create this very convenient text editor.

The Planner Calendar begins with monthly calendars from 1986 to 2085 which are scrolled with either mouse or cursor keys. Once a month is selected, clicking on any day makes the daily display appear.

This is a large window with a list of key tasks, memo, things to do list, and appointments for the day. Simple editing controls allow you to create an entire day's scheduling and can be successfully combined with the alarm for making certain you keep all of your appointments and commitments.

As you would expect, there is also a facility for printing out a day's schedule. You can also enter financial information into the diary which will automatically be carried into Partner's Expense Manager.

This keeps track of where your money is going so you can budget more accu-



*Creating a  
telephone directory*



rately. A mini financial database, it has pre-defined fields for date, amount, memo, type and two indexes.

After typing in the amount of the expense and its description, you then classify the expenditure into one or two indexes. These assist in keeping tabs on a particular type of expense by categorising them.

For instance, if £30 was spent on your car you may want one of the indexes to be Car. After the £30 expense is added to the list of car expenses, the search mode is used to either sort through or print out all the car expenses in the year.

The Calculator is straightforward and extremely versatile as it is designed and operated as an ordinary pocket calculator. It allows the numbers to be either input with the mouse or the number pad.

In addition to multiply, divide, add and subtract, you can compute percentages, fractions, hex, arcs, PI values, degrees and radian types of calculations, sine, cosine, tangent, square roots, and other advanced mathematical calculations.

There's also a calculator tape feature which lets you view all the steps of the calculation as you make them, as well as 10 memories for storing data for later retrieval.

The Disc Manager gives you instant access to Gem disc commands from within other programs in order to manipulate discs and files. There's no longer any need to exit a program in order to format a data disc or copy files.

Most of the functions on the Disc Manager are self explanatory. Copy allows you to transfer a file from one disc to another and Move does the same, except the original file is deleted after the copy is performed. You may also erase or rename files, format double or single sided discs, get information about a file, as well as create or remove a directory folder.

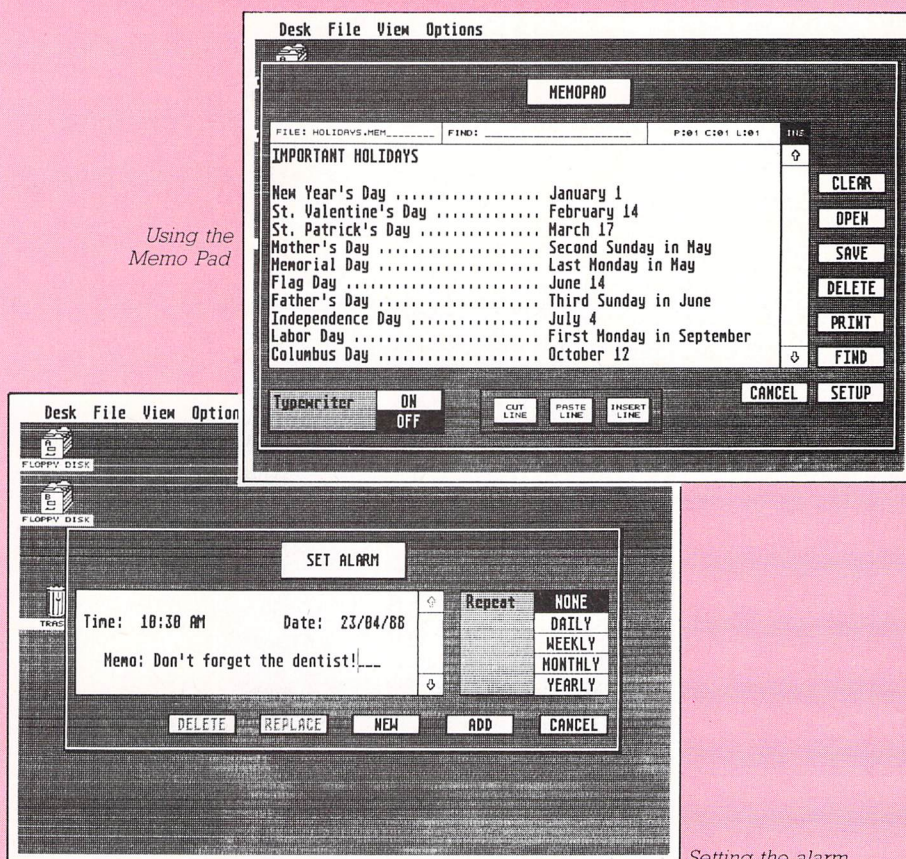
You may choose to view a file on screen, print a file and send printer commands to modify the appearance of hard copy. There is a setup option which allows you to customise the entire Partner ST program to your needs, as well as giving a reading of how much memory is free.

The Disc Manager performs all of the functions of the popular desk accessory Crystal, and just as conveniently.

The Thesaurus desk accessory is separate from the Partner disc and is the stand-alone version of the thesaurus built into Word Writer 2.0, Timeworks' word processor. It gives you access to synonyms for more than 60,000 words.

To find a synonym, simply type in the

Using the  
Memo Pad



Setting the alarm

word you wish to locate and the thesaurus will access its dictionary – which remains on disc in the drive – till it finds up to nine pages of words possessing similar meanings.

Its main difference from the thesaurus in Word Writer 2.0 is the fact that it will not implant the new word automatically into a document – you must manually

enter it yourself. Though not as comprehensive as K-Roget, another thesaurus desk accessory, it is certainly more practical and convenient to operate.

Finally, a desk accessory game, Escape, is included on the disc. A fast moving version of the classic Breakout, it

**Turn to Page 30 ►**

	Partner	Corneman	Fast	Backpack	Maxpack
Calculator	●	●	●	●	●
Address/phone book	●	●	●	●	
Alarms/clock	●	●	●	●	●
Memo/text editor	●	●		●	
Typewriter mode	●			●	●
Diary/Planner	●		●	●	
Auto dialler	●	●			
Calendar	●		●	●	
Expense manager	●				
Disc commands	●				
Ascii table		●	●		
Print file					●
Printer Initialise		●		●	●
Print buffer/spool				●	●
Dos window		●			
Puzzle/game		●			
Ram disc				●	●
Macro options					●
ST character set					●
Snapshot					●

A comparison of the features of five of the most popular desktop accessory compilations



◀ From Page 29

should relieve the tedium after long sessions at the keyboard.

Partner is a first-rate program. It is well designed and, unlike other similar programs, contains no dead weight – all its elements were carefully selected for the practicality and usefulness.

If you don't need an element of the

program, there is an option to deactivate that section so that it doesn't take up valuable memory.

Partner compares favourably with other similar compilations. It provides most of the functions of its popular competitor Backpack and expands greatly on most of them.

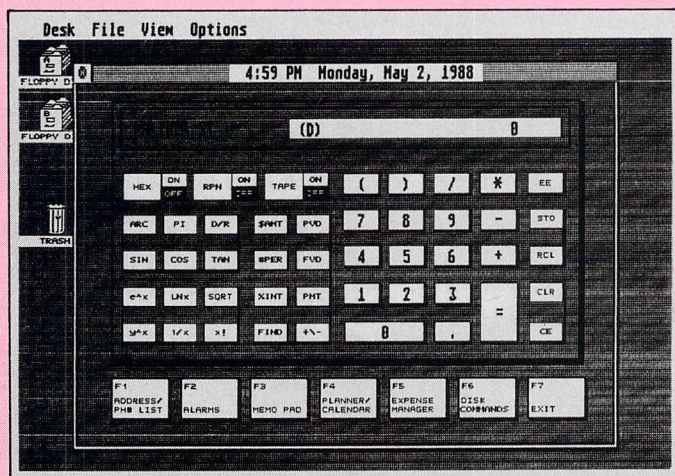
Backpack's only big advantage lies in its being a plug-in rom cartridge. This

advantage is a drawback to those wishing to use it in conjunction with another program or peripheral that is also rom-cartridge based.

Partner is also a vast improvement over Cornerman and Fast which are comparatively wasteful of memory through inefficient design and layout.

The thesaurus is a must for writers using word processors that don't have one built in. However, as it reads the dictionary from the disc everytime you use it, it can create inconvenient disc swapping if you don't have two disc drives or have enough memory for a large ram disc.

Overall, it's the best all round desk accessory program which I've seen aside from Maxpack, though it isn't fair to compare both programs since they feature almost entirely different collections of accessories.



Using the calculator

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Atari ST screen shots.

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**DEALER AND OVERSEAS ENQUIRIES INVITED**



**I**N the March 1988 issue of *Atari ST User* I reviewed WordPerfect, a word processor that is both sophisticated and versatile in operation. The PC version has been well known to be for some time and in the review I found that the ST incarnation contained a number of bugs that rendered it almost unusable.

The software for the ST has since been updated so here's a brief report on the new release.

In the review my major concerns were:

- Its inability to work fully on a single drive system.
- Menu options, especially the block cut and copy items remained highlighted after their action had been carried out.
- Footnotes were not displayed when created on pages where the column formatting option was enabled.
- The slash character was not recognised making it impossible to move through the hierarchical directory structure of Gem to access other directories.

Having disconnected my second drive, the software booted well on the single drive, though did prompt to say that drive B was not responding, and when cancelled requested that disc A be placed in drive A. Cancelling on both seemed to make the problem go away.

The software, while not recognising

# Nearly perfect

**WordPerfect has been updated since it was released – Bruce Smith reports on the changes**

when the incorrect disc is in place, now prompts to ask for the full path name of a file.

There does still seem to be a problem concerning incorrect key presses. While using the spelling checker I deliberately pressed a few wrong keys and the ST hung up and I had to re-boot.

Another niggling point that still exists is that it is sometimes impossible to escape from items once selected – you have to go through with them even if you don't want to, just to get back to the text. This is certainly the case when trying to change the printer options.

The problems associated with block copy, cut and paste have now been cured and this functions as it should. However it

still proved impossible to enter a footnote into text which was formatted into columns.

The overall reliability of the program, ignoring the problems that still prevail, is much better. Certainly the numerous phantom error messages that were issued on the earlier release have disappeared.

All that said, I would still be dubious about trusting any text in version 4.1 and as such GST's 1st Word Plus remains my preferred word processor for the ST. These problems with WordPerfect seem to be a direct result of the conversion process from PC to ST, as version 4.1 on the PC really is word perfect.

*Product: WordPerfect*

*Price: £228.85*

*Supplier: Sentinel Software, First Floor, Wellington House, New Zealand Avenue, Walton-on-Thames KT12 1PY. Tel: 0932 231164*

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THIS month's Gallery is devoted entirely to the highly talented Miss Nusarath Jahan of Handsworth, Birmingham, and the subjects range from the Taj Mahal to Christmas cards.

Nusarath started painting on the ST using Neochrome, but later moved on to Degas Elite which she used to create most of the pictures here. Now, however, she is using the much more advanced Quantum Paint and we can't wait to see the results. Each picture generally takes two or three days to complete.

If you have a work of art which you would like exhibiting on our worldwide stage, send it along. Don't forget though – it must be all your own work, you must hold the copyright to it and you must give permission to publish it.

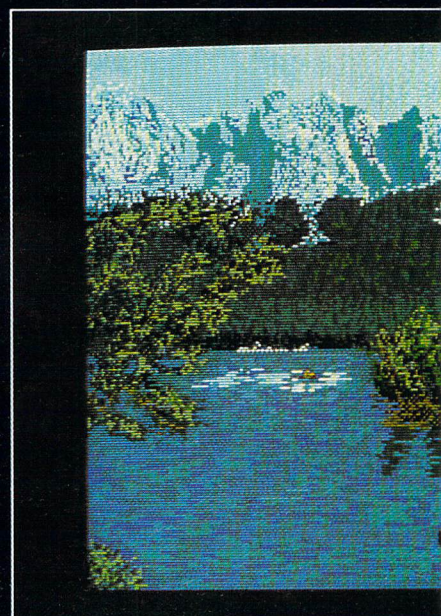


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# GALLERY



Japanese pagoda

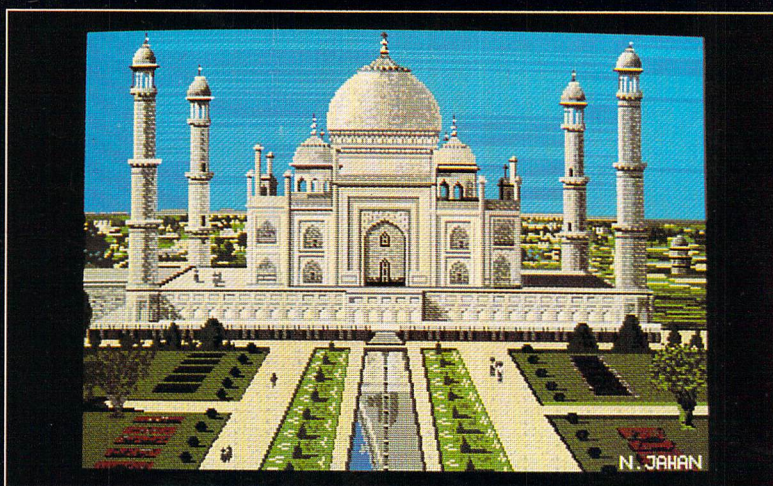


Messing about on the river





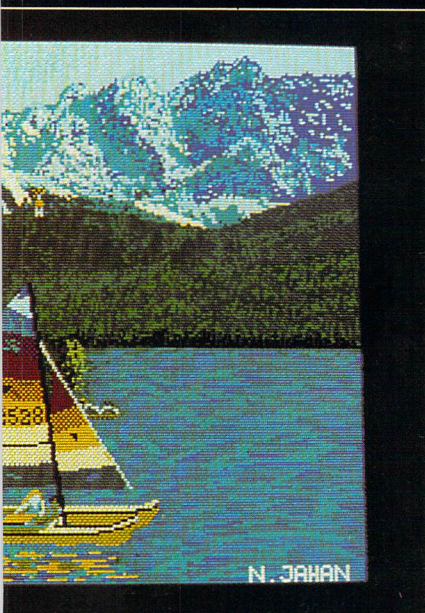
Snow scene



The Taj Mahal

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Christmas greetings 1988



## What this series is about

Have you ever wished you could produce spectacular artwork and superb graphic displays like the pictures featured in this month's Gallery? Well, it's not all that difficult. In this new series we'll be examining some of the techniques employed by artists and see how to go about drawing specific subjects.

Although this series is aimed at the ST artist using software packages such as Degas Elite, NeoChrome, Art Studio and so on, don't worry if you haven't got one yet as the techniques apply to any drawing medium – paints, brushes and crayons. Even computers are just tools in the hands of an artist.

**A**T an early age we were all taught to draw people as thin stick figures, and later progressed to fat stick figures. Most never progress beyond this stage, as our attempts are so comical and frustration sets in.

However, had our teachers taught us how to observe and draw, the situation might have changed. For while drawing the human figure can be difficult it is probably not as hard as everyone imagines. And if you follow the simple directions outlined in this article you'll be surprised at how well you can do.

The first thing you must realise is that the human figure is not made up of straight lines but curves, or more simply a combination of curves. To get these in the correct places you need to construct some type of understructure.

There are many ways to go about doing this; you can use ovals, trapezoids, double triangles, just to mention a few. The key element to drawing an accept-

# Beginners

# STAR

## here . . .

**Let artist Rita Plukss guide you through the different techniques of drawing the human body in the start of a fascinating new series looking at art on the ST**

able form is correct or sympathetic proportions of the various parts to the whole. Without this you have little chance of obtaining an acceptable representation.

A good example of this is the work of Picasso. Although his figures are proportionally incorrect the various parts are sympathetic to each other, and therefore the eye accepts what it sees as a recognisable whole, in harmony with itself.

Before you start drawing, first critically

study the object you want to draw – Matisse would spend months observing a still life before attempting to paint it. I am not suggesting you take that long – but you get the idea.

Pay particular attention to the relationship of each part to the whole. It doesn't matter whether you are drawing a car, a bowl of fruit or the human body, the principle remains the same.

The relationship of the parts is critical when drawing the human body. The arms, legs, torso, head and so on, all have to relate to each other to form a whole unit.

I know this sounds very involved, but what it really means is getting to know the relative proportions, because without these being reasonably accurate you will find it hard to draw a convincing figure.

Once you understand the basic structure and proportions of the human body, using a combination of shapes as a general outline you can practice getting a

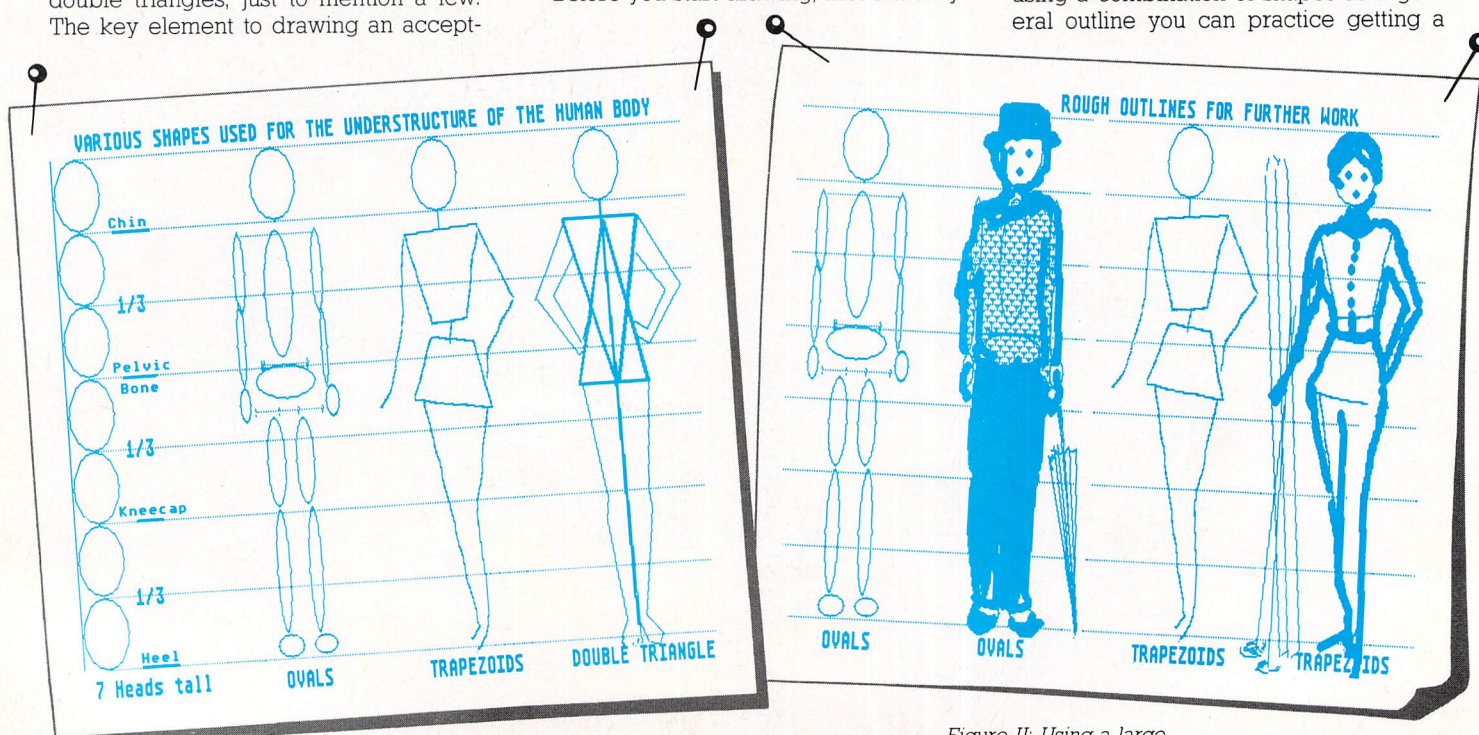


Figure I: Getting the proportions of the body correct

Figure II: Using a large brush, follow the contour lines



sense of proportion of all the parts.

All you need to do is simplify the components, that is, work with a series of general shapes rather than one large object.

The first step is to decide on the size of the head, as this will provide you with a simple measuring unit for the length of the body. The average female figure is from six to seven heads tall; the classic size being seven heads. The fashion figure is extended to eight heads to add a feeling of grace. The average male figure is eight heads tall.

Draw the head as an oval, then cut and paste another six heads for a female figure – seven heads for a male – directly under the first one. This will tell you how tall your standing figure should be.

While practicing I would suggest you draw straight lines between each head across the full screen so you have a guideline for further figures – you can see the idea in Figure I.

The next step is to fill in the chest area. Mark it out by placing the shoulder line slightly above the neck and place the lower hip line at about the half way mark of the body. The shoulders are nearly two heads wide, the waist one and the hips about one and a half.

To be more exact the distance from the chin to the pelvic bone is about the same as from there to the knee cap. And from the knee cap to the heel is the same distance again – one third of the body length measured from the chin. The hands finish just past where the legs start.

If you measure the height of the figure from the top of the skull to the heels you will find it is the same distance as from fingertip to fingertip when the arms are spread out parallel to the floor. In this way the body actually fits into a square.

With arms outstretched and the feet together, the navel becomes the centre of the body (an interesting thought in pass-

**Turn to Page 38 ►**

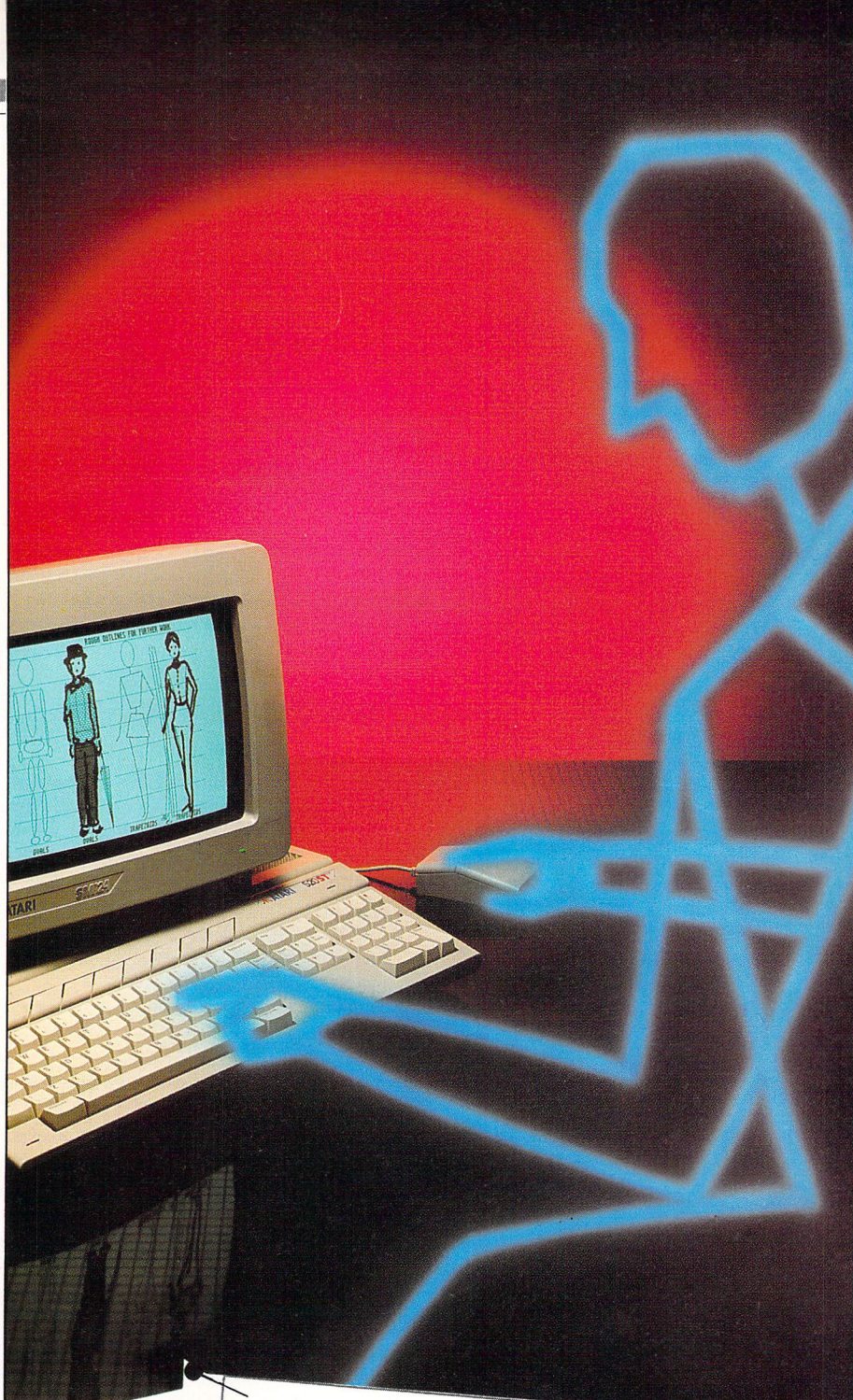


Figure III: Adding hair, hands, feet and clothes

Figure IV:  
Distorting the images



## ◀ From Page 37

ing, but not all that relevant to our immediate exercise).

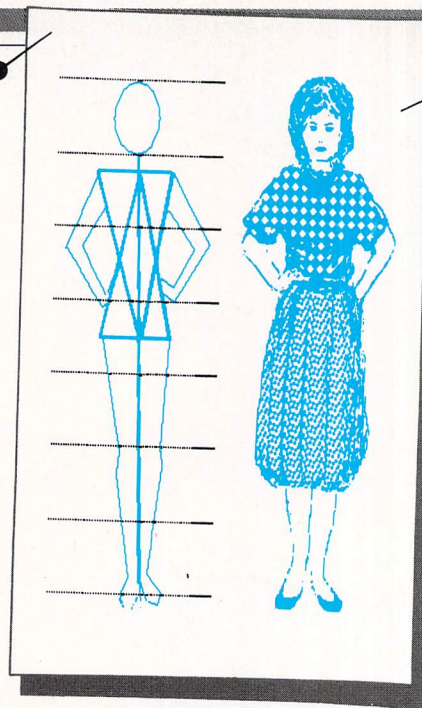
Enough theory, let's start drawing. Refer back to this article and the accompanying drawings if your proportions don't look right. There is no point continuing if you don't have the proportions realistically portrayed.

Having drawn your ovals and marked in your lines for proportion, the next step is to draw the actual figure. I find the easiest way to do this is to use the largest brush and follow the contour lines suggested by the underlying structure. When this is blocked in I add the suggestion of hair, face, shoes, hands and so on as shown in Figure II.

It is not until I have a satisfactory block drawing that I start working on the detail of clothing, the folds in the materials, the face and the hair. At this stage you can decide on whether you want a comical drawing, an impressionistic one or a realistic figure.

The type of finished detail will vary depending on your choice. I have left my working drawings in their rough format to give you an idea of the stages involved in a completed figure (see Figure III).

Once the block drawing is acceptable it is time to use a smaller brush and start



refining the picture by both erasing unwanted areas and defining detailed ones. This can be done very easily by using the magnify mode available on all art packages.

Adding colour, line and texture then completes your first drawing. Now it is time to start playing around with your creation.

Use the sizing options and try stretch-

ing the figure in various ways as in Figure IV. Start by using small increments and note how small changes can completely alter the feeling of the drawing.

Also try distorting only part of the figure. If something acceptable happens clean up the drawing again using the magnify mode. Flipping the figure can also at times produce a better final product than the original drawing. Strange, but true.

After you have saved your figure (you should save your work on a regular basis, especially before to any major or tricky changes) don't be afraid to experiment, as it is through experimentation that you learn new ways of doing things.

When your figure is finished you can paint in the background. If you have flipped or distorted the original shape you can include this second figure in the same picture.

By changing the colour and style of the clothing as well as the hairstyle you have a different figure – where you once had one, you now have two. This is what I did in the screen ballet dancers using Degas. Flip, distort and change – it's amazingly simple.

● *There's plenty of material here to keep you occupied till next month, when we'll move on to look at more drawing techniques.*



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# An elevating experience

Product: *Mission Elevator*

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Supplier: *Elite, Eastern Avenue, Lichfield, Staffordshire. WS13 6RX*

Tel: 0543 414188

At first sight *Mission Elevator* would appear to be yet another platform and ladders frolic – albeit with nice graphics – where the ladders have been replaced by lifts. However, as you proceed deeper into the game, the well thought out scenario begins to take shape and the puzzles get more involved with each level.

The story is essentially quite straightforward: You play the part of secret agent Trevor. Funny, I always thought secret agents had dynamic names like, Bond or Clint.

Specially enlisted to infiltrate a 64 storey hotel, Trev must locate and defuse a bomb placed there by a bunch of foreign secret agents. But this is no ordinary hotel, it is in reality a cover for one of the FBI's Central Intelligence Units.

Defusing bombs is a tricky business at the best of times, but to aggravate matters the 16 codes necessary to do the job have been deposited at various points throughout the building by an FBI computer specialist shortly before his capture.

You are briefed with these instructions: The hotel consists of 64 floors, split into sections of eight floors each. On each of the floors there are two sections of the code required to defuse the bomb.

The game starts in a sedate fashion, with Trev located in the basement of the hotel. From here, even the most inexperienced player should be able to figure out the most likely location of the first master key. Objects are examined by a deft flick of the joystick, the result of such examinations being shown in a status window at the bottom of the screen.

Once the first key has been located it's time to start searching the place for clues. Moving around is quite straightforward, travel between the levels being via the elevators of the title.

Everything can be examined, but taking the advice of the enemy will often bring predictable results. Examining a wall socket can be a shocking experience. Most of the time though, searching is fruitless and there's an awful lot to examine.

Of course, if the game merely involved nipping around searching for objects, clues and so on, there wouldn't be much of a challenge. To complicate matters there's a seemingly endless supply of well-trained bad guys armed with shooters and bent on your early demise.

In typical style, they appear at the most

awkward moments – from behind curtains, hiding in doorways and waiting to pounce at the top of the next elevator. Trevor does have defence in the form of a



pistol, fortunately with an unlimited supply of bullets.

To get between each section you have to locate the hall porter who holds a key to unlock the emergency exits – these being the entry points to the next section. Locked emergency exits? Programmer's licence, I suppose.

New levels bring new challenges. Level two in particular springs to mind. This brings the barman into play, an amusing character offering a choice of milk, beer or spirits. Playing it teetotal proves to be no advantage whatsoever – on the other hand consuming too much of the hard stuff results in you staggering around in a drunken stupor.

# Lunar lander update

Product: *Oids*

Price: £19.95

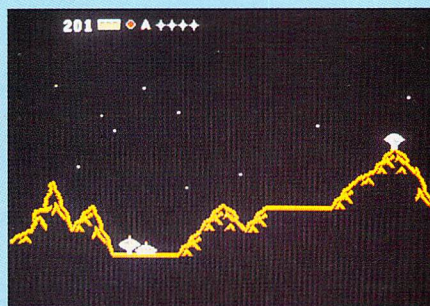
Supplier: *Mirrorsoft, Athena House, 66-73 Shoe Lane, London EC4P 4AB.*

Tel: 01-377 4645

At first sight *Oids* appears to be a simple budget-quality game – the graphics, sound and standard of programming is fairly basic. But it grows on you the more you play this update on the old lunar lander type game, popular years ago in the early days of micros.

The Biocretes, rulers of the galaxy, created a race of android slaves – called Oids – to serve them. These peaceful creatures are treated badly by the Biocretes – they're forced to work without rest, they are never given any oil and are melted alive to produce new Oids when they can no longer work.

You, a member of a peace-loving race, are outraged at their treatment and decide to free them from their life of toil and misery. You jump aboard your space



fighter, head for the nearest galaxy and dive down to the first planet.

The game opens with you descending toward the surface in your ship, and this is where the fun begins. The planet is bristling with defence systems consisting of gun emplacements, homing missiles, rockets, enemy aircraft and so on.

Your ship is equipped with its own defences – a rapid fire nose-mounted gun and a powerful force field. Unfortunately, the shield won't last forever, so you must

use it sparingly.

The object is to free the Oids by destroying the installations and buildings on the ground. They then dash about the planet surface frantically waving for help, and you must find a flat bit of land and set the ship gently down. The Oids will climb aboard and you can lift off and scout for more.

There are several galaxies to choose from and you can select the difficulty level before starting. The lowest is very easy while the top one is next to impossible – there are so many guided missiles and bullets flying around you get zapped within seconds.

Built into the game is an editor which enables you to create your own planets. You can place mountains, enemy bases, adjust the alien difficulty level and playtest the current planet.

Advanced features show you the whole planet surface drawn to 1/8th scale and the Help key will align mountains and bases for you if you can't quite get them into position. The planets can then be



## Oddball board game

Like all good arcade adventures, Mission Elevator offers a wealth of intriguing puzzles of a type that should keep most people amused for hours. There's a smattering of good humour and plenty of action, and while the graphics are a trifle cartoonish, the animation and scrolling are first class.

The game really falls down in the sound department. The most imaginative use I discovered was the chiming grandfather clock. Speaking of clocks, just in case you get too good, there's a time limit before the bomb goes off!

**Mark Smiddy**

Sound .....	4
Graphics.....	8
Playability .....	8
Value for money .....	7
Overall .....	7

### SECOND sight

*If I see another platform game I'll ... Seriously, this one is a real gem. The action is fast but not too much so. Similarly, the puzzles are tricky but not impossible. It's a thinking man's arcade game - I found the baddies a little too fast to call it an adventure. My only real complaint is that the joystick control takes some getting used to.*

**Paul Stubbs**

saved to disc for use within the game itself.

Although quite simple, this is an excellent game and all who played it found it good fun. It's exciting, challenging and I can thoroughly recommend it.

**Julie Boswell**

Graphics.....	6
Sound .....	6
Playability .....	9
Value for money .....	8
Overall .....	8

### SECOND sight

*"A budget game?" I enquired when I first saw this. "No", was the reply. This put me off straight away, and it wasn't until I had played it for half an hour that I began to enjoy it. It may be old hat, but it's great fun and quite addictive too.*

**Roland Waddilove**

Program: Eye  
Price: £14.95  
Supplier: Endurance Games, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.  
Tel: 01-804 8100

EYE is a board game which was heavily promoted in the toyshops last Christmas. It was invented by an oddball trio under oddball circumstances and it's billed as the perfect game.

The board consists of 32 coloured quadrilaterals which the rules call squares. There are eight different colours and four squares of each colour are in view at any one time. The other four are concealed by two spirals.

When you turn one the positions of the coloured squares - and the counters on them - move. Hard to explain, but easy to understand when you see it in action,



although trying to work out where the colours are going to appear is not so simple. The spirals on screen spin when you turn them, which makes it easier to visualise.

From one to four people can play and the object is to get the required number of counters on squares of your own colour. The number of moves you get per turn depends on how many counters you have on any one colour.

In the two and three player versions you can capture a colour by getting four or three of your counters on them at once. This allows you to move any of your opponents' counters on that colour before one of your moves.

There is a save feature, but it's rarely used as games tend not to last long. The computer gives you the option to swap pairs of colours after every so many moves. You can also choose whether or not colours can be captured at any time, whether an opponent can recapture them



and whether pieces are removed after capture.

The computer can control one, two or three players, but unfortunately it's not a very good player and I was easily able to trick it into what must be Eye's equivalent of fool's mate.

There's a nice animated loading screen, but very poor music. There's no music in the game itself, only a pling. My other niggle is with the instructions, which are terrible. Once you learn how to play you can send £2.45 to Endurance for the Official Eye Gamebook.

Eye is an interesting strategy game, but if I was playing against real people I think I'd prefer to use the board version.

**Ian Waugh**

Sound .....	2
Graphics.....	7
Playability .....	6
Value for money .....	6
Overall .....	6

### SECOND sight

*If you haven't played the board game you won't have a clue how to tackle this computer version, as the instructions are abysmal. I was completely lost and couldn't fathom out what on earth I was supposed to do. The game book should have been included with the software, as it is absolutely essential. Be prepared to fork out an extra £2.45.*

**Andy Richards**



# ATARI STAR USER GAME

Product: Xenon

Price: £19.95

Supplier: Melbourne House, 8-10 Paul Street, London EC2A 4JH.

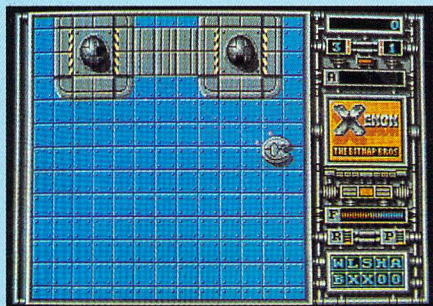
Tel: 01-377 8411

XENON is a multi-screen, vertically scrolling shoot-'em-up of the highest calibre from Melbourne House. Although many similar games have been released before, this must easily rate as the best, just knocking that old favourite, Goldrunner, off its pedestal.

The action is set in the distant future on a planet in a far off galaxy. A hostile race of aliens called Xenites suddenly sprang from nowhere and systematically began to take over planets, setting up bases and bringing in ships.

War soon broke out and peaceful trading ships – which normally don't carry weapons – were the Xenites' prime targets. Your task is to defend the fleet of trading ships from attack.

The game starts with you rushing to the rescue of a trader under heavy fire on a planet deep within Xenite territory. The only way to reach him is to battle your way through the Xenites' defences – not an easy task.



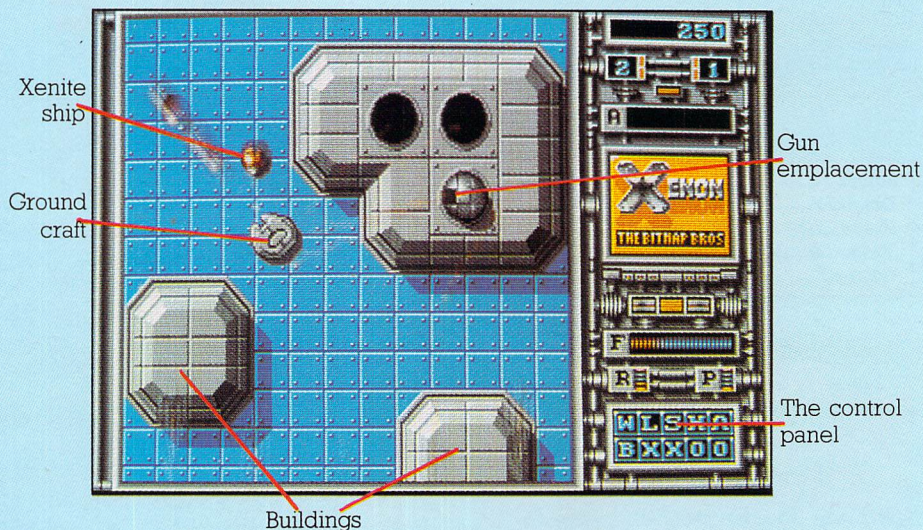
Most of the screen is taken up by a large window covering the left-hand side of the screen and part of the right, and this is where the action takes place. A panel running down the right-hand side shows such things as your score, weapons, fuel, status and so on.

Gameplay is split into four sectors and each is made up of two zones. You have a choice of two craft – a ground-based vehicle and a fighter plane – and you can switch between them at will.

The ground craft is capable of moving and firing in eight directions, but its progress can be blocked by buildings and other structures. The fighter plane can fly over these obstacles, but without extra weapons can fire only forwards.

The Xenon gun emplacements are

## The ultimate arcade game



hidden below ground and as you approach, doors slide open and they are brought to the surface. They swivel round, tracking your ship and open fire.

When the guns are hit they are sometimes taken below ground and replaced by either another similar gun, a canister or weaponry that you can pick up and add to your plane or ground craft.

There are 11 types of canister, giving you armour, fuel, homing missiles, lasers, guns, power, increased speed, side lasers, wingtip weapons, zap pills and rotating balls that follow you and fire when you fire.

Sometimes collecting one type of canister will cancel the effect of another, so guns will replace lasers and rotating balls may replace wingtip weapons. Your ship is equipped with shields which consume fuel when hit by enemy gunfire or if you collide with an enemy fighter.

The Xenite defence system consists of many different types of gun, ground and aircraft. Each requires a different technique to destroy them or negotiate the section, and these will have to be learnt by much trial and error. Some craft will only attack from the ground, others from the air and in some sections of the game you'll have to decide on the best type of craft for the job.

The graphics are brilliant and the landscape scrolls down the screen very smoothly. The way the doors in the ground open and gun emplacements are brought up from below is superb. The action is fast and furious and there's no time for a breather in between attack waves – it's just one long battle.

Halfway through each section is a sentinel – an enormous Xenite craft with

extra-thick armour plating. This must be destroyed before you can move on. I had great difficulty getting past a sentinel. However, once this is out of the way you can progress fairly easily – until the next one pops up.

The music is superb, and a neat touch is the way a digitised picture of one of the Bitmap Brothers – the programmers – pops up and announces the start of each section.

This game is an absolute must and deserves a place in every arcade game collection. I can thoroughly recommend it to anyone looking for the ultimate fast action shoot-'em-up.

**Roland Waddilove**

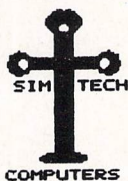
Sound .....	10
Graphics.....	10
Playability .....	10
Value for money.....	10
Overall .....	10

## SECOND sight

*Wow! what an amazing game. This must rate as one of the best seen so far this year. It's incredibly fast, very addictive, has brilliant graphics and superb sound effects and music. I love the digitised announcement of each section. Go out and buy it now, you won't regret it.*

**Andy Richards**





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# Up, up and away

Product: *Gunship*

Price: £24.95

Supplier: Microprose, 2 Market Place,  
Tetbury, Gloucestershire GL8 8DA.

Tel: 0666 54326

THE biggest ever seller for Microprose – *Gunship*, a helicopter simulation – has reached the ST in what must be its definitive incarnation. Everything about it is impressive, starting with superb packaging.

An 88 page operation manual and the two discs are the cornerstone of the distinctive red package, which also includes a technical supplement, a sheet containing passwords and countersigns, and a keyboard overlay to identify all those crucial functions.

As well as being a brilliant simulation, *Gunship* also involves the player much more than lesser products by introducing you to the game as a lowly sergeant and letting you progress through the ranks as your skill and fame as an ace pilot grow.

Expect to pick up the odd medal and award as you fly missions around the world in increasingly dangerous situations. And when the inevitable happens, see your name recorded in the books as one of the all-time greats.

Before you get anywhere near that though, a number of steps need to be undertaken to get you airborne. The first is identifying a vehicle to prove you are not a commie infiltrator.

Assuming you're an Uncle Sam faithful, the default screen is displayed. This is where you see the last mission flown by the selected pilot, his duty assignment to an area of the world, style of flying and reality levels.

There are five areas of the world to tour, including simply training, South East Asia, Central America, the Middle East, and the ultimate in risk scenarios, an East-West confrontation in Western Europe.

Beginners should steer well clear of Europe and concentrate on practice in the States, taking a run at Asia only when they feel they have attained a certain mastery of their craft.

There are three styles of behaviour while you are on combat tour in a region. Stick to regular missions and you might make it back home alive. Volunteer for hazardous missions and you are likely to be shipped home in a box.

A final set of variables to contemplate are enemy and reality levels. Just how hard do you want this simulation to be? Make your choices here. Actually it is the combination of duty assignment, flying

style and reality level that set the risk factor for your next mission.

This in turn affects scoring, likelihood of promotion and honours – posthumous ones if you try to be a hero too often. On you progress to the briefing on your next mission. Primary and secondary target map coordinates are given, which it is advisable to note down, along with weather conditions and time of day. Also given is the password.

If you've digested all the information, and the mission looks like a one way ticket to Boot Hill, you can always decide to go on sick leave. For routine expeditions against the enemies of freedom this is a cop out for the cowardly.

But when the the mission is doom laden, and the weather is so bad you can hardly fit a sidewinder without exceeding



the maximum weight allowance, only a certifiable idiot gets into his helicopter.

If everything is to your satisfaction, including the armament suggested by the

**John Butters takes a brief look at some late arrivals**

## QUICK PEEKS AT

### Addictaball – Alligata

NOW released as a budget title, this is a version of *Breakout* with a difference. You go through many levels trying safely to guide your bat as opposed to the ball. As bricks descend towards your bat they can be destroyed by either bouncing the ball off them or, if in difficulty, you have a limited amount of ammunition to fire at them.

Sometimes fireballs will fall from the bricks once they have been struck and

these can be disposed of by hitting them with your bat. If any hit the barrier at the bottom of the screen they will burn a hole through which the ball can fall.

If you miss any bricks you will have a limited amount of space to move the bat. A life is lost each time the bat hits a brick, alien or if the ball falls through the barrier at the bottom. A full review of the original game can be found on Page 54 of the December 1987 issue of *Atari ST User*.



### Space Ace – Infogrames

LEE ENFIELD is Space Ace. He defies our understanding of travel, being able to move through even the largest barrier of all – time. Now attempting to rescue his old friend Bill, he knows his fight will be a tough one as he encounters robots, monsters and snipers.

The aim is to kill off all the enemies sent by Yellow Shadow to destroy you. They will often be found hiding behind buildings and rocks waiting to pounce. If you are not quick on the draw they will shoot – and they very rarely miss.

On the screen you will see the sights of your laser rifle, a sophisticated piece of equipment which will also indicate where the enemy is hiding. You will also hear a ringing sound which will become higher pitched when the opposition is ready to fire.

Yet another fantastic game with reasonable graphics and fast action which is good value for money.



computer, insert disc two and get airborne.

Dials, indicators and CRT displays are waiting on the control panel in the cockpit. Outside, through the armoured glass you can see the three dimensional world of Gunship waiting to put you to the test.

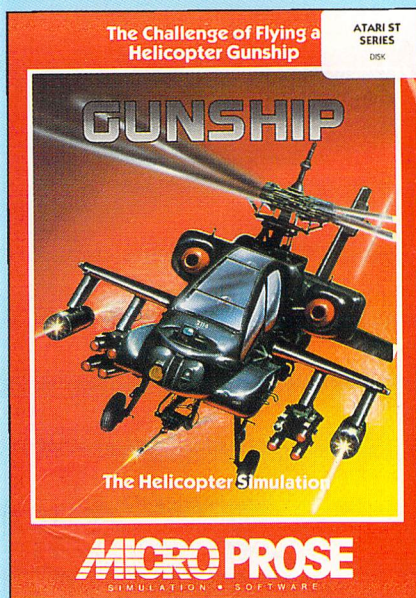
Activate the left and right engines, engage the rotor and select the speed of ascent. The blades chop into action, a throbbing noise fills the cockpit, and the AH-64 Apache gunship rises.

If you have never flown a helicopter before, or a simulator, it may come as a surprise to find yourself going nowhere but up until you push the nose down at an alarming angle to create forward movement.

The attitude and artificial horizon gauge informs you when you're on the right track. The airspeed indicator picks up as the altimeter and VSI even off. Radar and infra-red warning indicators are okay, the threat display is empty, you've a full tank of fuel, and all weapons stores are full and ready to go.

The first hill looms up, and hugging the ground you sweep around it and head for enemy territory. A CRT display serves a number of functions, one of which is a map with a representation of the Apache and its current direction of travel.

The compass and course indicator are used to get to the general area, while the map can be used to pinpoint objectives. On the top half of the screen a TADS



gunsight box reticle is superimposed to help destroy targets.

Should you manage to avoid fire from the ground and complete the mission successfully you must still make your way back to base without losing your multi-million dollar machine. If you came up trumps, a promotion and an awards ceremony are the rewards. If not, better luck next time.

Gunship's graphics are first rate for this sort of game. While the animation is not fast, it is certainly fast enough, and

undoubtedly slicker and smoother than all the other versions of this program.

The sound effects are also professionally implemented, with the whine of the engines and the chopping sound of the blades adding to the effect.

If you liked Flight Simulator 2 but wished it packed a little more punch, abandon that sombre affair and gird your loins for the ultimate flying combat experience. There is only one word for the ST version of Gunship: Awesome.

**Mark Luckham**

Graphics.....	9
Sound .....	8
Playability .....	10
Value for money .....	10
Overall .....	9

## SECOND sight

*Flying a chopper makes a refreshing change from the standard flight simulator. I've never flown a real helicopter, but this program is certainly everything I imagine one would be like. The controls can be a bit overwhelming at first, but you soon get used to it. It gets the thumbs up from me.*

**Andy Richards**

# THE NEWEST RELEASES

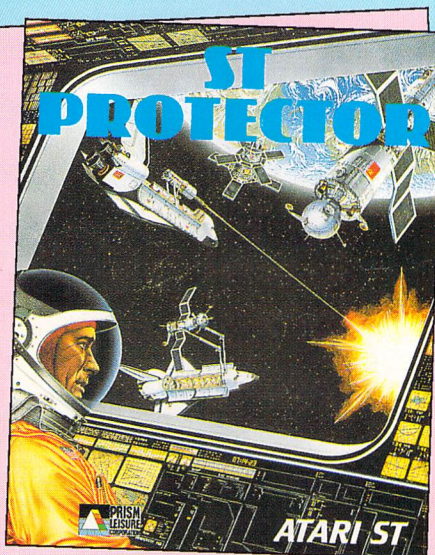
## ST Protector - Prism Leisure

AS in many other arcade games, the object is to protect your planet from invasion from aliens. There are many stages to the game, each one having a different scrolling background.

At the top of the screen you will find a radar which will give you advance warning of where the nasties are waiting. Other features included to aid you in the battle are hyperthrust to enable you to escape from tricky situations or to catch up with aliens, and smart bombs which will clear the screen of all aliens.

You only have two of these bombs to start with, but gain one more for each level you clear. Bonus points are awarded for saving humanoids at the bottom of the screen.

If you have played well, at the end you will be able to enter your name into a high score table. Overall, a budget



priced game with very little to make you want to go back for more.

## Space Station - Prism Leisure

AS Callum MacGregor, chief inspector of the Federation's Space Stations, you are sent on a mission to investigate peculiar happenings at Alpha-3. As you arrive you find you are short of fuel and that the crew does not assist you.

Once aboard you find out why - the station has just been invaded by aliens. The only way to escape is to go around the 100 rooms collecting enough lithium crystals to refuel your craft.

As well as this tricky task you must activate the self-destruct mechanism by using the special security computer disc stored somewhere in the station.

For its price this game is quite reasonable and should give several hours of fun.



# Clever comic caper

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

CRASH Garrett's days of flying bootleg liquor, gun-running and shoot-outs with the FBI are now behind him. These days Crash is legitimate and runs an air-taxi business with the help of his longtime sidekick Grease Flanagan.

He's part domesticated, too, thanks to his relationship with his girlfriend Glory Streek, a no-nonsense production assistant at Mega Movies.

The time is the late 1930s, the place the good old US of A. What many Americans don't know is that Nazi spy and sabotage networks are being set up right on their doorstep.

The style of this innovative text and graphics adventure is very much gung-ho Biggles, tougher and American in tone and unfolded with tongue firmly planted in cheek.

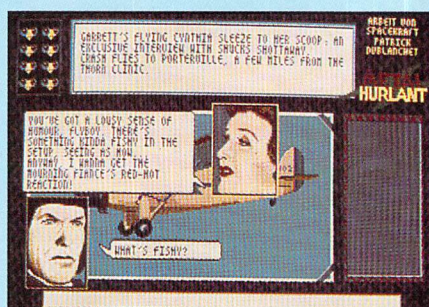
In the game, you are a voice inside Crash's head and will guide and advise him throughout the adventure. One of the objectives is for you to find out just what the voice is and where it comes from.

The adventure takes place over two days in 1938 and starts in mid-flight. Crash is taking Cynthia Sleeze, a gossip columnist, to interview a famous film star. On landing, Cynthia is escorted into a building by a menacing Arab and Crash is confronted with a lead pipe-wielding mechanic called Mongrel.

After a punch-up or two Crash is captured by some Nazis who have a nasty plan in mind for the future of the rest of the human race. Only Crash can thwart them. Ringleaders in the plot are monoc-

led Engels von Krull, psychoanalyst Dr Thorn and Helga Klam. Helga likes nothing better than to slap Crash while shouting such stereotyped phrases as "Shut up, pigdog!"

For his part, Crash has a nice line in hardboiled wisecracks in the face of mortal danger: "You'll pardon my not



shaking your throat!". The whole thing is quite over the top and all the more enjoyable for it.

The main part of the screen is taken up with an impressive picture of the current location on which are overlaid objects and the heads of various characters as they pop up during the game.

These heads smoothly slide and peel on and off and around the screen at appropriate moments, creating an air of activity that is normally missing from such games. Fighting is usually shown by a moving giant fist and the words Bam! and Pow!, while all dialogue is within speech bubbles, making the game seem rather like a colourful, interactive comic.

Narrative appears in a text window at the top of the screen while a single-line window at the bottom is used for your text input. Over on the left is a box containing eight identical symbols, each representing a dose of special power. Using a

dose enables Crash to carry out a particular instruction with greater efficiency. To the right is another box containing, in graphical form, all the items in your possession – no need for an inventory command.

Unfinished games can be saved and reloaded by the unusual commands of Disk and Game respectively. The speed at which narrative, pictures and text are displayed and removed can be adjusted by typing T and a number from one to nine, one being the fastest. I found it best to set it at the lowest speed and then to tap the spacebar whenever I wanted the action to move on.

Graphics and spot sound effects are put to good use in this highly unusual game. What I am less sure about is the command parser – the vocabulary seemed rather limited and I was often hunting for the right form of words to express an action.

For instance, a stone vase on top of a covered well would not respond to push, pull, get, lift or break and the program didn't indicate whether or not I was barking up the wrong tree or simply hadn't found the right action.

Examining visible and quoted objects is often a waste of time since you are nearly always told there is nothing unusual about them. As this game emanates from France, I hope nothing has been lost in the translation.

That said, Crash Garrett is a funny, enjoyable and original adventure and well worth considering. Biggles flies again!

**Bob Chappell**

<b>Presentation</b> .....	<b>9</b>
<b>Atmosphere</b> .....	<b>9</b>
<b>Puzzlement</b> .....	<b>9</b>
<b>Value for money</b> .....	<b>9</b>
<b>Overall</b> .....	<b>9</b>

## SECOND sight

This adventure is brilliant – the comic book graphics and Marlow type humorous wisecracks are very amusing. I like the way the faces of the characters slide around the screen and speech bubbles appear when they say something. The action sequences are also cleverly done with Crash, Bang Wallop appearing on-screen. Recommended.

**Andy Richards**

Helga Klam



Crash Garrett

Engels von Krull



Product: *Test Drive*

Price: £24.95

Supplier: Electronic Arts, Langley Business Centre, Station Road, Slough, Berks, SL3 8YN

Tel: 0753-49442

NOT many of us can afford a £50,000 Ferrari, but for £24.95 you can have the next best thing with *Test Drive*. A series of beautifully detailed screens illustrate the cars of your dreams – the Lamborghini Countach, Corvette, Ferrari Testarossa, Lotus Turbo Esprit and Porsche 911 Turbo.

In each case, a page of technical information fills you in on the car's performance characteristics. Drive type, displacement, compression ratio, torque, transmission type and acceleration curve don't mean much to me, but a top speed of 173 mph is something I can understand.

When you pick the car of your choice the window rolls down to show the grinning driver and the car roars off the screen in a cloud of dust. Then it's on to the open road to burn some rubber.

The display shows the view through the windshield, with the spinning steering wheel, speedo and rev counter, police radar detector and rear view mirror.

Your aim is to make it to the top of a mountainous stretch of road as quickly as possible. The rockface on your right and

# Dream machine

the ravine on your left present the most immediate dangers as you push the joystick forward to accelerate and hit the fire button to change gear.

However, as you progress more factors impede your progress – potholes, water slicks, slow drivers and lumbering lorries to name a few. Sound effects of howling motors and screeching tyres add to the atmosphere.

The radar detector at the top left of your windshield will beep and flash to indicate whether you have been picked up by a speed trap. If you don't slow down to the maximum speed indicated on the road signs you may soon see a police car appearing in your rear-view mirror.

You can try to outrun him, but if he overtakes you and you then crash into him you're out of the game. Your car screeches to a halt, your windscreen shatters, and it's straight to jail for you. At the end of each stage you see your car pulling into a garage and you are given an assessment of your performance.

*Test Drive* is graphically attractive, exciting to play and feels very realistic, especially if you engage the option which makes the gear shift respond to joystick movements.

The scrolling and undulating of the

road and the animation of the other vehicles are well done, but it's a pity there isn't more variation in the landscape – the rock wall soon becomes monotonous.

**Chris Jenkins**

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

## SECOND sight

*I've yet to see a realistic car racing simulation on the ST – the screen display, handling and general feel just aren't quite right. However, it's a good game with nice graphics and reasonable sound. It's fun to play and quite addictive, though £25 is a bit steep for my pocket.*

**Andy Richards**

# Behind the Iron Curtain

Program: *Tetris*

Price: £19.95

Supplier: Mirrorsoft, 66-73 Shoe Lane, London EC4P 4AB.

Tel: 01-377 4645

A COMPUTER game from the Soviet Union? Strange though it may seem, *Tetris* from Mirrorsoft was in fact developed by the Computer Centre at the USSR Academy of Science, which is headed by Victor Bjrabim.

After it became popular there it spread to the rest of the Eastern Bloc, where Hungarian software house Andromeda Software picked up the copyright. Mirrorsoft, as Andromeda's main passport into the West, was the natural choice for the UK market.

*Tetris* is a simple strategy game, but one that could only exist on a computer. The central vertical strip of the screen is the playing area and down it drift, or hurtle if you are playing on skill level nine, block shapes, one at a time.

The objective is to rotate the shape and direct it using the keys or joystick, so it fits into any gaps where the shapes collect at the bottom. Should a horizontal line be completely filled that line disappears and your score is boosted accordingly.

The difficulty lies in the fact that there are a number of different shapes and half



the time they don't fit together. They leave spaces, or air pockets and until these are filled the blocks won't disappear and the shapes continue collecting, reaching up towards the top of the playing area.

When there is no more room, the game finishes and you can see how well you did. Big scores are made by continually clearing lines and laying the blocks down evenly at the bottom of the playfield.

The rest of the display is given over to brick-a-brack like score and options, and also a box labelled Next. The Help box gives most of the key commands – 3 turns off the heaving background that fills the playing area, 1 activates the Next box which shows you which will be the next shape to appear after you have disposed of the current one.

This is essential for planning and for-

ward looking, if you have the time. Played on the higher levels, you will be so hard pressed on taking care of the current block that there is no time to look ahead.

Although it is graphically simple, it is also completely refreshing and original. *Tetris* is one of those horribly addictive games that always gets you saying, "Just one more game".

**Mark Luckham**

Graphics.....	6
Sound .....	8
Playability .....	9
Value for money .....	8
Overall .....	9

## SECOND sight

*Everyone laughed when they saw the primitive programming and graphics used in this game, but once you've played it you won't be able to stop, it's so addictive. I first saw this on the Amstrad, and preferred that version to this. However, it's still a good game.*

**Julie Boswell**



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# Dungeon adventure

**Product:** *Dungeon Master*

**Price:** £24.95

**Supplier:** Mirrorsoft, 66-73 Shoe Lane,  
London EC4P 4AB.

**Tel:** 01-377 4645

THERE are only three notable role playing games on the market for the ST – Alternate Reality, Phantasie III and The Bard's Tale. A fourth which should have joined that trio last year has finally emerged, FTL's *Dungeon Master*.

The reason it has taken so long to release becomes apparent as soon as it has finished loading. The software spends ages decompressing data – there's about 700k held on one disc.

The plot casts you as Theron, overseer in spirit form of a party of four dead characters, now reborn, ready to take on the challenge of Chaos.

Down in the dungeon things are stirring and the outlook is bleak. It originally belonged to your boss, but during a dodgy attempt to lay his hands on the Power Gem he suffered a serious dose of schizophrenia.

His nice half was kicked off this plane – and guess where the bad half ended up? The quest is to seek out the Firestaff and return it to your master's good side.

There are a number of features unique

to *Dungeon Master*, the most immediately noticeable being the graphics. Not only are they large and attractive, they are also functional. If you spot a button on the wall, you can press it.

Objects can be picked up and passed around the party. There is also some animation – you can throw things down the corridors and see them disappear into the gloom. If you trek down after them you'll find them against a wall or on the floor.

Even better, the defenders of this danger-infested hell hole are also animated. See those monsters lumber towards you, thrill to the sound of sword biting hide, chill to the sight of a monster lunging towards you!

Sampled sound is used to good effect as chains clank and doorways creak. One of the other innovative ideas is the magic system. Sets of symbols are grouped into the four influences of power, element, form and alignment.

Uttering the appropriate symbol draws Mana from your body. The more powerful ones require not only more Mana, but also experience and skill to cast properly. It helps if you have a character with a high Mana rating.

The real stars of *Dungeon Master* are the traps. Many are fiendishly clever and

require manipulation of objects before a safe passage can be guaranteed.

This is a straightforward hack and slash with plenty of puzzling to be done, but the animated graphics and spot sampled effects make this quest worth dusting off your codpiece for.

**Mark Luckham**

<b>Graphics</b> .....	<b>9</b>
<b>Sound</b> .....	<b>8</b>
<b>Playability</b> .....	<b>8</b>
<b>Value for money</b> .....	<b>8</b>
<b>Overall</b> .....	<b>9</b>

## SECOND sight

*I'm not too keen on these role playing games – a good shoot-em-up is more to my taste. Having said that though, *Dungeon Master* is well written, the graphics and sound effects are good and it is quite addictive if you're into these sort of games.*

**Andy Richards**

# Fun at world's end...

**Program:** *Terramex*

**Price:** £19.95

**Supplier:** Grand Slam Entertainments, Victory House, Leicester Place, London WC2H 7NB.

**Tel:** 01-439 0666

OK, so the world is about to end again and you are the only person who can save it. Hardly a new scenario. Grand Slam's *Terramex* is another colourful, fun arcade adventure.

Mad scientist Dr Albert Eyestrain has warned that in 20 years Earth will be dealt a terminally damaging blow by an enormous passing meteor. Ridiculed and scoffed by his contemporaries, Dr Eyestrain becomes a recluse.

As the years roll by it transpires that the meteor story was rather more than pie in the sky, and the projectile is right on course for Earth. Doctor Eyestrain must be found, as he has devised a Positronic Asteroid Deflector and is the only one who can advise on its assembly and use.

Once you have found the elusive doctor you might think that all was well. Think again. The Positronic Asteroid Deflector apparently came in kit form, and you must find all seven sections.

At the start of your quest you can

choose which of five explorers you want to be: Wilbur Fortesque-Smithe (British would you believe?), Big John Caine (USA), Henri Beaucoup (French), Herr Wolfgang Schmuck (German) and Wu Pong (an Oriental chappie). Choose your character and you're off.

Walking through the landscape there are many useful items to be found and nasties to be avoided. Objects can have pretty obscure uses – when was the last time you went flying on the Hoover?

Others are more straightforward – for instance a magic flute to placate some decidedly unfriendly snakes.

Explorers are traditionally hunky, rugged and macho. Your man has other ideas. Ask him to do anything remotely daring and he'll need some pushing. He will initially refuse to budge, shaking his head, but eventually does as asked after a few prompts. This is particularly annoying if you are under attack at the time.

As you collect objects they are passed to your bearers and you can use only one object at a time. This can be selected from the inventory by scrolling the bearers in the bottom right hand corner of the screen and changing items.

You'll have a lot to keep you busy in *Terramex*, it's not going to be solved in an

evening. The graphics are jolly and colourful, but won't win any awards for artistry and certainly put no strain on the ST's capabilities.

There are many games around of this ilk but the added humour of *Terramex* makes it a good buy.

**Niels Reynolds**

<b>Sound</b> .....	<b>6</b>
<b>Graphics</b> .....	<b>7</b>
<b>Playability</b> .....	<b>7</b>
<b>Value for money</b> .....	<b>6</b>
<b>Overall</b> .....	<b>7</b>

## SECOND sight

*This is a pretty ordinary arcade adventure. The cartoon-like graphics are OK, the sound isn't too exciting, and the gameplay is only average. The problem with *Terramex* is that it just didn't grip me and I tired of it fairly quickly. I'd advise you to try before you buy.*

**Andy Richards**



# Basic maze adventure

Product: *Slaygon*

Price: £19.95

Supplier: Microdeal, PO Box 68, St Austell, Cornwall, PL25 4YB

Tel: 0726-68020

IF you have plenty of time, patience and keen eyesight, you'll enjoy *Slaygon*. It's one of those games that might look unimpressive initially but grows on you. You can easily find yourself absorbed well into the small hours.

Written in GFA Basic, *Slaygon* is a variation on the old 3D maze theme. In this case, the setting is a high-tech laboratory complex. Your task is to deactivate the control computer and destroy the reactor – and with it, a nasty little bacteriological weapon under development.

The sole screen display, shows all the instruments of your *Slaygon* battle vehicle, as well as the view ahead. My one criticism is that all the corridors look alike, and as you move through them you'll soon get bored with the scenery.

Fortunately you can activate your

scanner, which builds up a colour-coded map of the surrounding area. This shows the corridors, doors, guards, objects and traps – if you can make out the tiny dots representing them.

You must find colour-coded security



passes which are left lying around and open particular doors. You can identify the objects you find by activating the Query function, and store them using Take. Some serve no purpose, so you must choose which to keep and which to discard.

As you search you'll come across some

nasty shocks, particularly guard robots which shoot as soon as you open a door. You can shield yourself against them, but this uses energy.

Your sensors can be activated to tell you whether you have a chance of out-gunning a robot.

There are other dangers – proton mines which can only be by-passed using a mine deactivator, force fields and ion beams which have their own counter-measures.

Depending on the level you select before starting the game, the objects will be distributed more or less at random throughout the complex.

So far I've run out of energy before getting anywhere near solving the problem, but as the map builds up the game progresses faster, so I live in hope.

Fortunately, there's a save/load game facility, so you needn't complete the whole quest in one go.

*Slaygon* resembles an adventure game in many ways – it's not a test of reaction time or coordination skill, but an exercise in mapping, logic, and manipulating

## DIY wargames

game you care to name.

The reason is that with military simulations no two games are ever the same because of the sheer number of decision combinations available to the player. By splashing out on just one game, SSI's Wargame Construction Set, that variety of play can be expanded to almost infinity.

This superbly versatile piece of software lets you design your own wargames from any period in history, ranging from battles with spears and clubs right up to modern conflict with tanks and missiles. The only limitation is your own imagination.

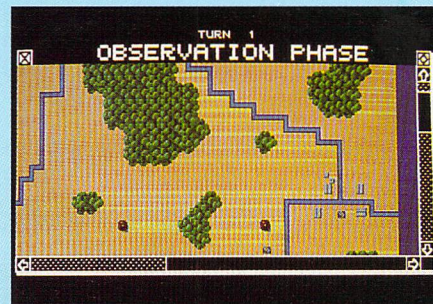
WCS contains two programs – an editor and the game. Using the editor, you can design and save your own maps and units, deploying them how you will. There is a wide range of terrain to choose from including roads, rivers, bridges, woods, hills and buildings.

Similarly, each side can have up to 31 customised units, including type, names, icons, firepower, defence/assault capability, movement, strength, range and other attributes. Map and unit colouring can be selected to suit your own tastes too.

Having designed your map and units, the latter can be placed across the battleground and the whole scenario saved

for later playing as a one player – against the computer – or two player game, or for future re-editing. Given the scale of the options and factors open to you, WCS offers virtually unlimited potential.

The game allows you to play out any of your own custom scenarios or those that come ready-made on the disc. Broadly speaking, order of play follows the traditional phases of most wargames. In a one player game this would be observation, player fire, player movement, enemy and



player fire, enemy movement and fire, followed by a totting up of losses and an opportunity to save the game.

Use of the editor and control of the game is simple – all commands can be executed using the mouse. The graphics



Program: *Wargame Construction Set*

Price: £24.99

Supplier: SSI/US Gold, Units 2&3, Holford Way, Holford, Birmingham B6 7AX.

Tel: 021-356 3388

LOOKING purely from the point of long term playability and sustained interest, penny for penny you probably get far better value for money from an SSI strategy game than from almost any other



objects. In this sense it should appeal to a wide range of players who are more impressed with depth of gameplay than with flashy graphics or sophisticated animation.

Chris Jenkins

Sound .....	4
Graphics.....	6
Playability .....	8
Value for money.....	7
Overall .....	7

## SECOND sight

Slaygon has fairly ordinary graphics, sound and screen display. There's little animation, and I wasn't at all surprised to find it was written in GFA Basic and compiled. Still, it's fairly good fun, and if it was on a budget label I'd recommend it. But it's not, so I won't.

Andy Richards

are sharp and colourful and sound enhances the atmosphere. Among the many features, the map zoom facility stands out as making the gameplay even more enjoyable.

WCS is unquestionably an exciting development and excellent value for money. While it may lack some of the complexities and sophistication of Rainbird's recently released UMS, it will undoubtedly appeal to a wide range of gamers.

Bob Chappell

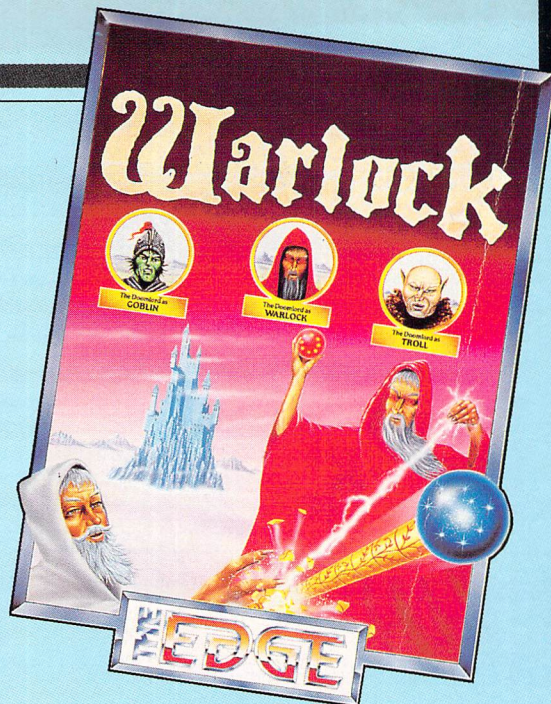
Sound .....	8
Graphics.....	9
Playability .....	10
Value for money.....	10
Overall .....	9

## SECOND sight

This isn't really my cup of tea, but it is implemented well and wargame fanatics should be delighted. An enormous range of scenarios can be created to provide you with a never-ending supply of unique games to play against the computer or a friend.

Julie Boswell

# Long ago, best forgotten



Product: Warlock  
Price: £14.95  
Supplier: The Edge, 36/38 Southampton Street, Covent Garden, London WC2E 7HE  
Tel: 01-831 1801

WARLOCK, the name of the latest game from The Edge, is sited long ago in a land far away, and for a change, you take the character of a baddy – Doomlord of the fallen world.

Under your rule, life has been pretty rosy – well, for you anyway – and everybody is happy, except the people, and they don't matter do they?

The White Wizard – representing the forces of good – has decided to lead a rebellion and storms your fortress, Doomrock a spacious castle incorporating many large, airy rooms. Perhaps they're in need of some maintenance and modernising, but a snip for any wizard.

You aren't too pleased and set out single-handedly to vanquish the self-proclaimed Army of the Light which has succeeded in converting a few of your creatures to their ideals.

Before they stormed Doomrock, you managed to secrete a few changling spells about the place. Looking suspiciously like skulls on pedestals, they have the power to change you into one of your three guises – warlock, goblin or troll.

Each form gives you different powers, the warlock being handy with magic, the troll having incredible strength and the goblin being a bit of a compromise. The game starts with you as Warlock, being chased and blasted by princesses, monks and armoured knights.

The object is to locate a certain orb of power in order to defeat the White Wizard. For some not adequately explored reason, the good guys appear from distinctly dodgy-looking portals in

the floor, and these may be destroyed.

Three gargoyles on screen indicate your status – the left one shows your magic level, on the right the number of lives left and in the centre brute strength.

The screen shows a 3D view of the current room from a point in the top corner. The game is far too slow – it takes at least three seconds to draw a screen when you enter a room, and you plod along as though you're wearing lead boots.

Better games – though, admittedly, in monochrome – have been around on the Spectrum for years, and most run far faster. Warlock hasn't been thought out properly, and not enough time was spent on the programming. The loading screen isn't too good either.

Shame, really. I hope The Edge takes more care with its next project.

Roy Stead

Graphics.....	7
Sound .....	5
Playability .....	5
Value for money.....	5
Overall .....	5

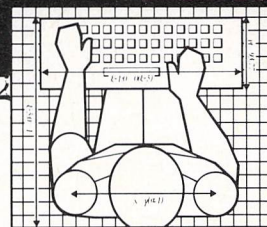
## SECOND sight

I was very disappointed with this – I've seen several games by The Edge on other (less powerful) micros and they are much better. The ST is a fast micro, but you wouldn't think it, looking at this. The graphics could be better, too, and the sound isn't up to much. I'd give it a miss.

Andy Richards



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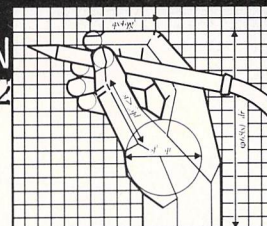
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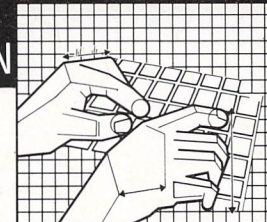
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# Making a record

**I**T is surprising how quickly your library of discs grows. Within just a few months of buying an ST, most owners have at least 20 discs and many have more.

What is needed is a utility that automatically keeps track of the files, and that's where Quick-List comes in.

This is a budget-priced utility designed to help you keep track of all your discs and the files stored on them. It will read all the filenames off each disc and record them in a database. This information can then be stored on disc itself as a data file.

The illustrations show the main screen and Help file. Looking at the main screen I'll go through the icons in turn. The first is **A.B.S.**, which tells you who wrote the software, in case you missed all the other messages displayed on boot-up.

**Sort** will sort all the files in the database into either alphabetic or disc order – every disc must be given a unique number. **Quit** simply quits the program, while **Load** will load a database stored on disc.

**See** will let you scroll through the list of files and Print will print the lot out. **Save**, saves the database to disc. **Find** is used to search for a particular file, or all the files on a particular disc. These can then be printed out as a separate list.

**Memory** displays information about the system – the amount of memory left and the number of files stored in the database. The maximum number allowed is 1,170. It also offers you the option to change the default drive.

**Dir** lists the files on the current disc in the drive. However, it won't look inside any folders, so its use is somewhat restricted. **Alter** enables you to change the filenames of the files stored in the database, while **Trash** will remove them completely.

**Read** scans a disc and stores the filenames in the database. It looks in each folder – if any – and records those too. **Add** is used manually to add a file to the

**If you can never find the file you need, this handy utility, reviewed by Julie Boswell, will help you keep track of them. And a fast disc formatter is thrown in**

store. And, finally, **Help** brings up a series of Help screens – one for each icon.

Although Quick-List is superbly presented, fast and easy to use, it does suffer from a couple of major drawbacks. The first is the small number of records allowed in the database.

I processed eight double sided discs containing more than 300 files. This means that the program can only be used to record around 30 discs. You would then have to start another database file.

The second problem is that you can't store any other information in the database apart from filenames. So although you have more than 1,000 files at your fingertips and you can tell which file is on

which disc, you haven't a clue what each file is or what it does. Of course, meaningful filenames help here – but can you think of 1000 meaningful names?

Mastermat is a disc formatting utility bundled with Quick-List. You can format single or double sided and set the number of tracks and sectors. You can gain extra storage space by squeezing 82 tracks with 10 sectors per track on to your discs providing your drives can handle this number.

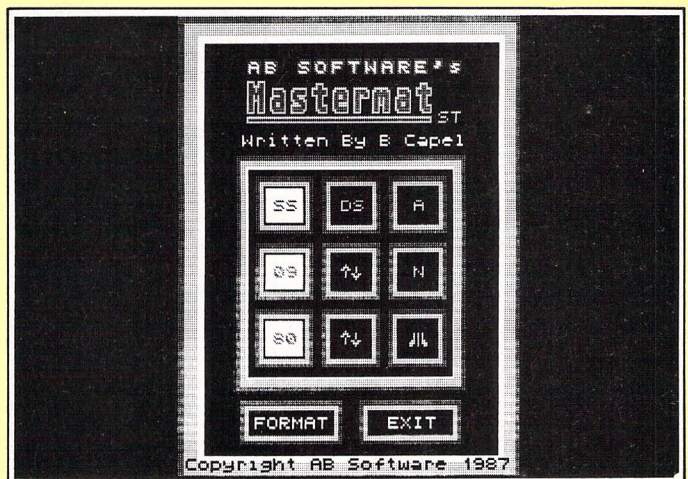
Alternatively you can opt for a fast format which rearranges the sector numbers, optimising the disc for speed. A 38 per cent reduction in loading time can be achieved.

Quick-List is a handy utility to have around in spite of the two problems outlined. An added bonus is the multi-formatting utility for creating fast discs or extra storage space. This has got to be a bargain at only £6.99.

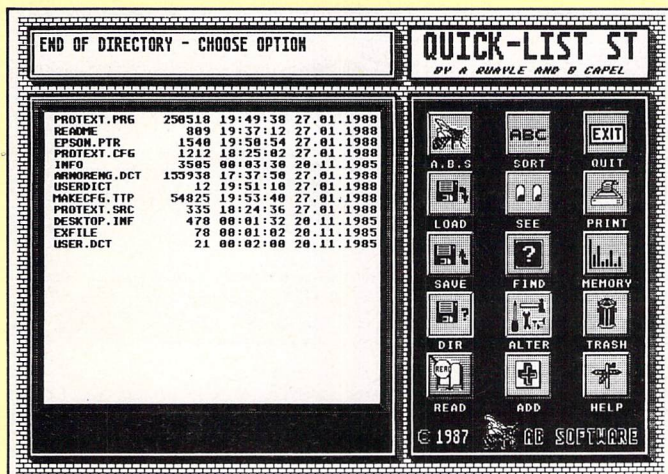
Product: Quick-List + Mastermat

Price: £6.99

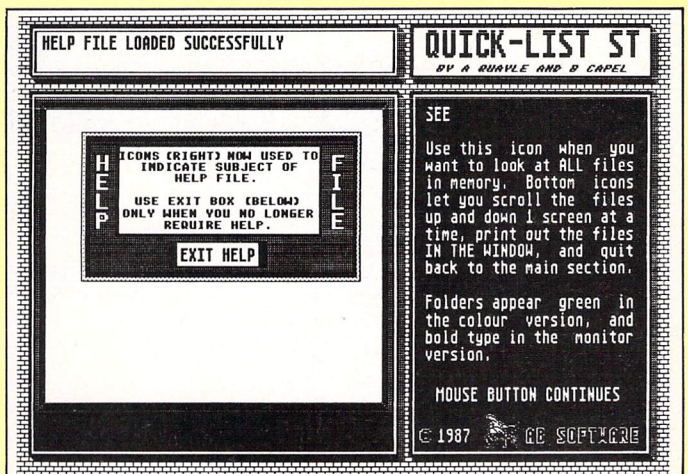
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The Mastermat menu



Quick-List's main screen



Quick-List's help screen



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# Get yourself certified!

**T**HE American company Springboard will not be familiar to most ST users, as it specialises in educational and productivity software, mainly for the IBM PC, Apple Macintosh and Commodore 64. The company's first ST package is Certificate Maker, which is being promoted by Microprose.

Any program which caters for a specific task well within the field of desktop publishing will have to either be very simple, so that the complete ST neophyte can get to grips with it quickly and easily, or very flexible and powerful, thus out-gunning a general purpose DTP package. As we shall see, Certificate Maker follows the former path.

This product is targeted at teachers and lecturers, clubs and associations, parents, religious orders, employers, and to some extent the average person in the street.

Certificates have long been recognised as a useful way of rewarding people for achievements, exceptional performance, and for recognising work over and above the call of duty.

The problem has been that they are relatively expensive and time-consuming to produce if you required anything other than a limited and very standard off-the-shelf design.

Certificate Maker sets out to remedy both these problems – first by costing under £25 for the software. The only other expense is for stiff paper – assuming you have an ST, preferably with two disc drives, a TV or monitor, and a printer. Secondly, it incorporates more than 200 certificate designs.

The packaging is impressively sturdy. The case is moulded plastic, which is important if the product is to be used in an educational environment where small fingers can wreak havoc.

Inside are two discs – one is the master program – a 66 page manual, of which 19 are instructions, with the rest being taken up by the designs of the 200 plus certificates, and finally, 36 circular stickers to add a little flair to the finished award.

The program runs equally well in both medium and high resolution modes, and requires a small amount of disc swapping – life is easier if you have two drives.

There are three shapes of certificate: Full page vertical or horizontal, and small.

**Mark Luckham treats himself to an award – courtesy of Certificate Maker from Springboard**

The designs in the manual are set and you can't reduce or enlarge them. Each design consists of six elements – the title, illustration, border, text area, date and signature line.

The first step on the road to creating a certificate is to enter from the manual the number of the design that you wish to use. There are 220, grouped into sections for easy reference – unique, office, academic, sports, family, children, religious, and general awards.

There is quite a variety, covering all the target users mentioned earlier, including a number of humorous titles to bestow upon deserving friends: The Pigsty Award, Lemon Award, Certified Idiot, Poor Sportsmanship, and not forgetting the Thanks For Nothing award.

Once a design has been selected, you are stuck with the accompanying illus-

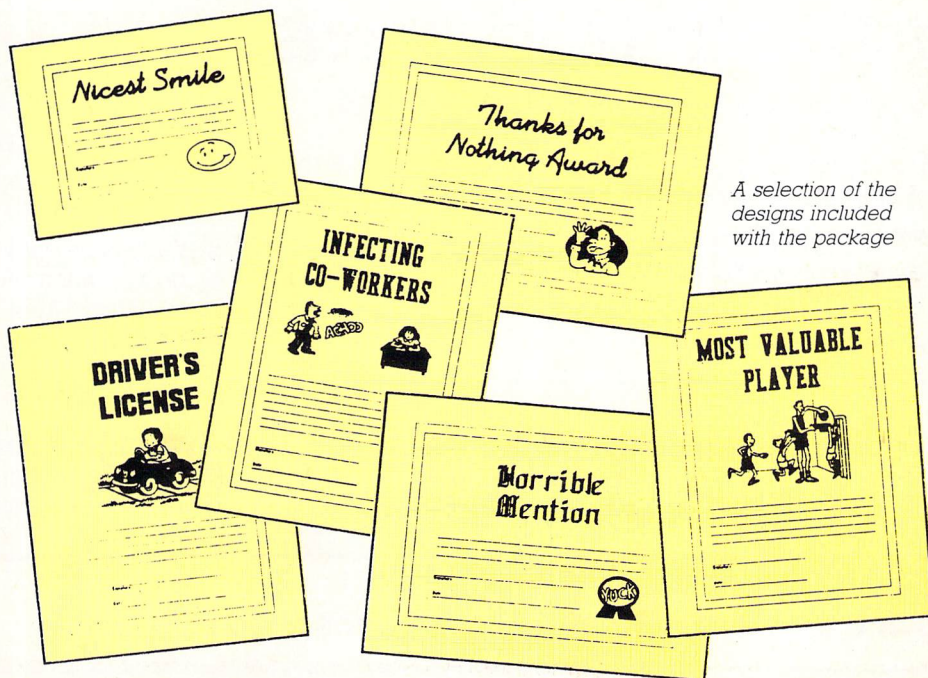
tration. If there is a fault with Certificate Maker, it is this – you can't design your own illustrations or alter the preset ones, and you can't import graphics from any other application.

Most of the certificates have a fixed title, but a number in the general award category are untitled so you can create your own awards or honours.

Editing the blank area on the certificate can either be facilitated by using the pull down menus, or by pointing and clicking at the relevant section of the on-screen representation of the certificate.

Next select a border. There are 24 designs to choose from and once again you can't change those on offer or design your own. Virtually all of the borders are usable though, and range from the over-

**Turn to Page 56 ►**





## ◀ From Page 57

whelmingly flowerly to straightlaced one or two pixel-thick lines.

Body text is the area where you have greatest control. You can fill in details of the award, and how or why it is being presented. There are five fonts and two text sizes on call here.

The fonts are Serif, Sans Serif, Script, Gothic and Art Deco, and the text can be aligned to the left or right of the text section, or centred. There is no provision for loading alternative fonts.

To help polish up your purple prose there are a few standard word processing functions – cut, copy, paste, clear and undo.

The date line entry simply allows you to enter the date in whatever notation you desire, although if you try to be too verbose, it will not fit into the space reserved for it. Equally, the signature line places the name of the signing party underneath the dotted line.

And that's it as far as creating a certificate goes. After saving your master-piece to disc it is necessary to install the correct printer driver before producing hard copy. The list of printer drivers is

long, and virtually all 8-pin printers, no matter what the badge on the case, are catered for. However, if you are lucky enough to have a 24-pin printer it had better be a well known make.

An additional feature for those wishing to present the same award to a number of

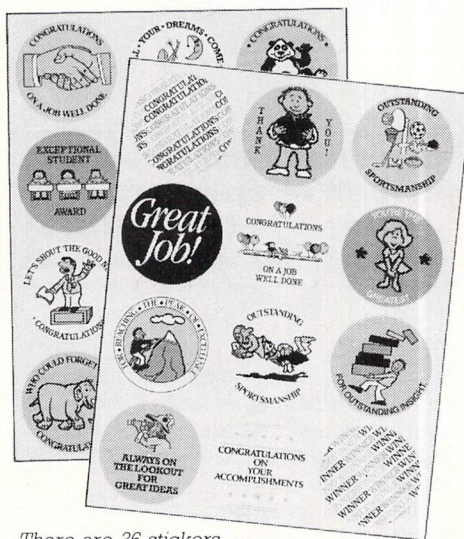
people at once – say a school class – is being able to set up a name list, and then use it to print out a batch of awards.

Instead of producing a powerful and flexible package that would be all things to all users, Springboard has gone completely in the opposite direction. Certificate Maker is incredibly simple and easy to use. After just a few minutes' experimentation your first certificate can be rolling off the printer.

Because of its delightful simplicity, and lack of flexibility, this program is perfect for use in educational and club environments.

However, the awards are probably too lightweight to be of real use for employers wishing to reward employees.

For anyone else, it all depends on whether they envisage a use for most of the certificates provided. If the answer is yes, then Certificate Maker is an ideal product.



There are 36 stickers available to add a little flair

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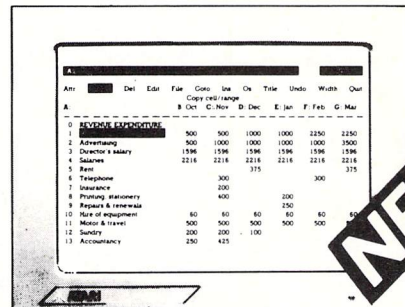
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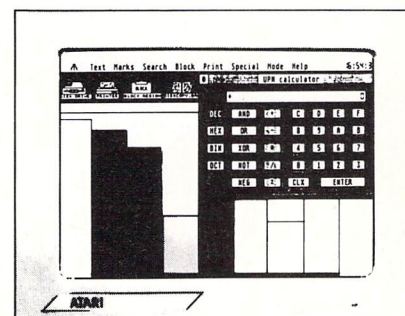
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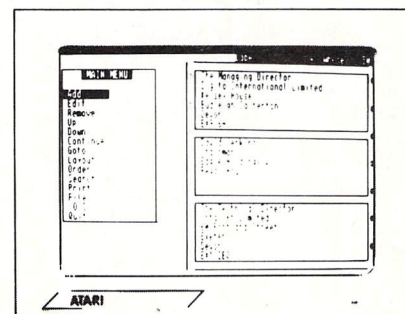
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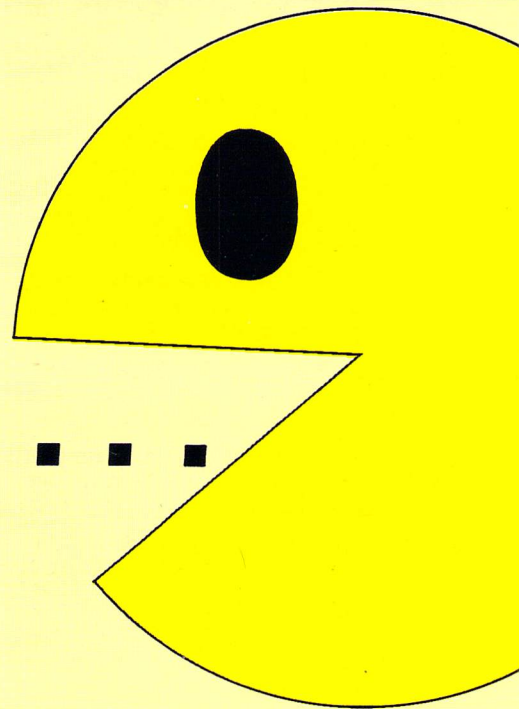
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# Is it a plane? Is it a pacman? No, it's a cursor



**M**OST of you probably know that the ST has a number of built in mouse cursor icons. If you don't, then wake up and have a play with Program I – there's the familiar arrow and bee, a hand and various sized crosses.

Apart from these, Gem also allows the use of user defined cursors, which are surprisingly easy to create, even in Atari Basic. Type in and run Program II. The arrow immediately changes to a pacman. Amazing, eh?

Also, note that the options on the menu bar are not activated until the pacman's mouth hits them. This is called the action point and can be any one of the 256 pixels in the cursor matrix.

The cursor is made up of two planes, the mask and the cursor itself. You can think of the mask as the border running around the mouse which helps the cursor stand out. Otherwise, if the cursor goes over a similar colour on the screen, it will disappear.

Each plane can be a different colour. If you are using a colour monitor change the 0 in line 40 to 3 and the 1 in line 45 to 2. Re-run the program, and the mouse should change from black to red with a

**Bored with your mouse pointer? Now you can change its shape with Michael Baxter's utility**

green border.

Creating the data for a new mouse shape is a pretty monotonous task. Two arrays of 16 words are required for the mouse – bit 15 of the first word is the top left-hand corner.

C programmers must define a 37 point array with the first and second words being the X and Y coordinates of the action point. The third word must equal one, the fourth and fifth words must be the colours for the mask and cursor, and the remaining 32 words are the data for the mask and cursor. Install the new shape with:

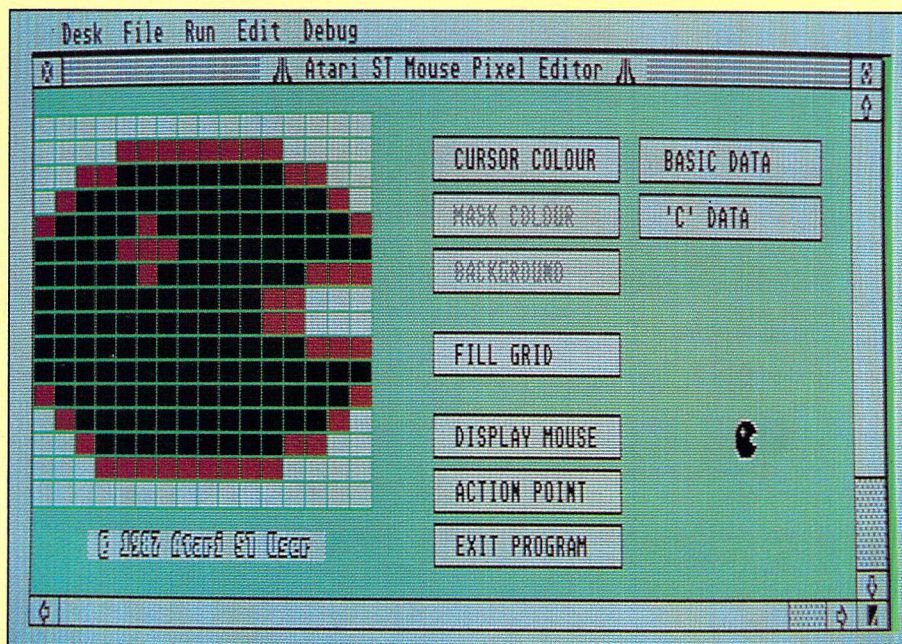
```
vsc_form(handle,array);
graf_mouse(255,array);
```

If you are going to use a piece of graph paper, then the best of luck – it's far easier to use a pixel editor. Program III does the job perfectly. It is entirely

mouse-driven. Simply design your mouse in the 16 x 16 grid, specify the action point, and it will create all the necessary data for use within your own programs.

If you are a Basic programmer click on the Basic Data box and a new file called MOUSE.BAS will be created. This can be merged into your programs and used with the routine in Program II.

C programmers can click on the C Data box. This will create an entire routine which can be compiled and linked into your programs. Call the



A pac-man mouse cursor

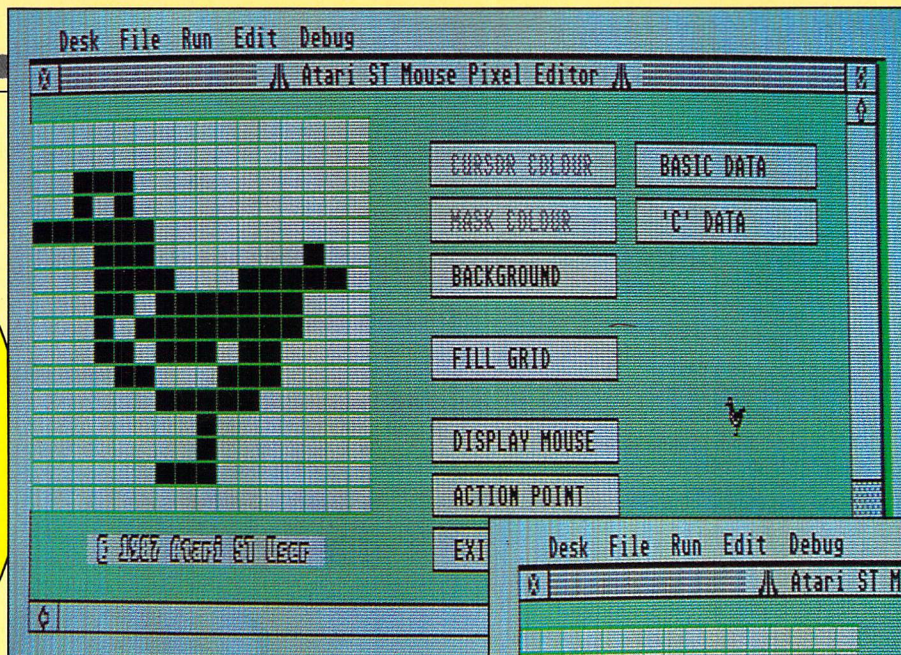
## Program I

```
10 REM Program I
20 a#=gb:Gintin=peek(a#+8)
30 Gintout=peek(a#+12):?"Press Left button"
40 for shape=0 to 7
50 poke Gintin,shape:GEMsys(78)' Display new shape
60 GEMsys(79)' Get Mouse Status
70 if peek(Gintout+6)<>1 goto 50
' Left Button?
80 for g=1 to 100:next ' Short Delay
90 out 2,7:next:end ' Sound bell & continue
```

## Program II

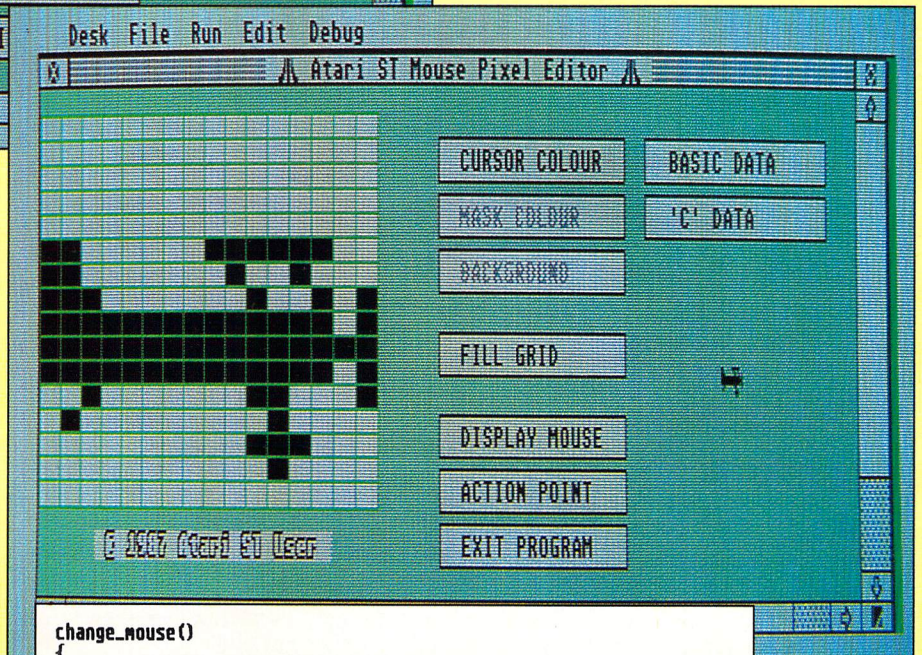
```
10 REM Program II
20 Change.Mouse:
30 Poke Contrl,111:Poke Contrl+2,0:
Poke Contrl+6,37
40 Restore 1000:Read Act.X,Act.Y
50 Poke Intin,Act.X ' Action point
X
60 Poke Intin+2,Act.Y' Action point
Y
70 Poke Intin+4,1 ' Must be 1
80 Poke Intin+6,0 ' Mask Colour
90 Poke Intin+8,1 ' Cursor Colour
100 for i%=10 to 40 step 2:Read A%:Poke Intin+i,A%:next
110 for i%=42 to 72 step 2:Read A%:Poke Intin+i,A%:next
120 VDisys(1): End
```





A chicken

A plane



routine with:

```
change_mouse();
```

The routine accesses the Gem graphics library, so remember to link your main program with Gem and open the workstation in the normal way.

While using the pixel editor you can check your progress by clicking on Display Mouse box. The mouse will change to your current design, and any specified action points will be activated. Click the right button over the same box to return the cursor to an arrow.

The editor will only operate in medium resolution, although with a bit of work you could get it running in high resolution.

Have a creative day!

```
change_mouse()
{
    int form[37]; /* Lattice C users change 'int' to 'short' */

    form[0]=0; form[1]=0; /* X,Y Action point */
    form[2]=1; /* Must be 1 */
    form[3]=0; form[4]=1; /* Colours for mask and cursor */

    /* 16 word group for mask */
    form[5]=0; form[6]=8184; form[7]=8196; form[8]=16386;
    form[9]=33825; form[10]=3120; form[11]=7224; form[12]=15420;
    form[13]=0; form[14]=0; form[15]=3276; form[16]=13184;
    form[17]=0; form[18]=12876; form[19]=52659; form[20]=0;

    /* 16 word group for cursor */
    form[21]=0; form[22]=0; form[23]=8184; form[24]=16380;
    form[25]=31718; form[26]=62415; form[27]=58311; form[28]=58115;
    form[29]=65535; form[30]=65535; form[31]=62259; form[32]=52431;
    form[33]=65535; form[34]=52659; form[35]=0; form[36]=0;

    vsc_form(handle,form);
    graf_mouse(255,form);
}
```

The mouse data file created by the editor

```
130 'Lines 150-190 were created
140 'Using the pixel editor
150 Data 9, 8
160 Data 960, 3120, 4104, 8196,
17160, 17168, 32800, 32832
170 Data 32832, 32800, 16400, 16
392, 8196, 4104, 3120, 960
180 Data 0, 960, 4080, 8184, 15
600, 15584, 32704, 32640
190 Data 32640, 32704, 16352, 16
368, 8184, 4080, 960, 0
```

#### Program III

```
10 ' *****
20 ' ** Atari ST Mouse Editor **
25 ' ** By Michael Baxter *
30 ' **** (c) Atari ST User ****
35 If Peek(Systab)<>2 then ?"Medium
Resolution only." : End
40 Option Base 0: Dim Y.Grid(15),X.
Grid(15),Cursor(15),Bit(15),Mask(15)
50 Gosub Title.in:Gosub Init: FullW
2: ClearW 2
60 Def FNx.pos=int((Peek(Ptsout))/1
5.9375)
70 Def FNy.pos=int(((Peek(Ptsout+2)
)-30)/8)
80 Gosub Grid
90 Gosub Form.Menu
100 Main.Loop: Gosub Mouse.Status
110 If but=1 then Gosub PRINTfill
120 If but=1 and x>299 and x<436 go
to select
130 If but=1 and x>450 and x<581 go
to Create.Data
```

```
140 If but=2 and x>299 and x<456 and
d y>128 and y<141 then Gosub Reset.Mou
se
150 Goto Main.Loop
160 Select: y=peek(ptsout+2):gosub m
se.off
170 If y>38 and y<51 then col=1:s=0:
Gosub Mcol:s=2:Gosub Bcol:Gosub Back
180 If y>56 and y<69 then col=2:s=0:
Gosub Bcol:s=2:Gosub Mcol:Gosub Back
190 If y>74 and y<87 then col=0:s=0:
Gosub back:s=2:Gosub Mcol:Gosub Bcol
200 If y>100 and y<115 then Gosub Gr
id.Fill
210 If y>164 and y<177 then Goto Pr
og.End
220 if y>128 and y<141 then Gosub Ch
```

```
ange.Mouse
230 if y>145 and y<159 then Gosub Ac
tion.Pnt
240 s=0 : Gosub Style: Gosub Mse.On:
Goto 140
250 Mcol: Gosub Style: Gotoxy 35,2:?
"CURSOR COLOUR":Return
260 Bcol: Gosub Style: Gotoxy 35,4:?
"MASK COLOUR":Return
270 Back: Gosub Style: Gotoxy 35,6:?
"BACKGROUND":Return
280 Create.Data:y=peek(ptsout+2)
290 if y>38 and y<51 then Gosub Basi
c.Data
300 if y>56 and y<69 then Gosub Crea
```

Turn to Page 60 ►

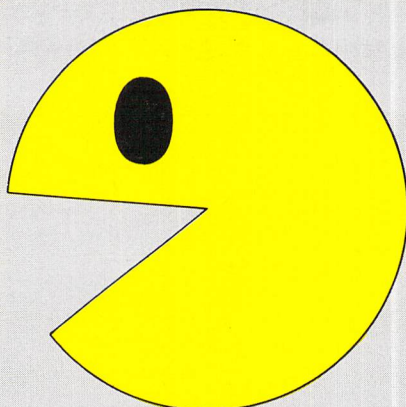


## ◀ From Page 59

```

te.C
310 Gosub Reset.Mouse:goto 140
320 PRINTfill:
330 If Fy<0 or Fy>15 or Fx>=16 then
Return
340 Color 1,col: Gosub Mse.Off:Fill
X.Grid(fx),Y.Grid(Fy)
350 If col=1 and fx=0 and Cursor(fy
)>32767 Goto 430
360 If col=1 then If(Cursor(fy) and
Bit(fx))<>Bit(fx) Goto Scbit
370 If col=2 and fx=0 and Mask(fy)>
32767 Goto 430
380 If col=2 then If(Mask(fy) and Bi
t(fx))<>Bit(fx) Goto Smbit
390 If col=0 then If(Cursor(fy) and
Bit(fx))=Bit(fx) Goto Clcbit
400 If col=0 then If(Mask(fy) and Bi
t(fx))=Bit(fx) Goto Clmbit
410 If col=0 and fx=0 and Cursor(fy
)>32767 Goto Clcbit
420 If col=0 and fx=0 and Mask(fy)>
32767 Goto Clmbit
430 Gosub Mse.On: Return
440 Scbit:
450 Cursor(fy)=Cursor(fy)+Bit(fx)
460 If fx=0 and Mask(fy)>32767 Goto
550
470 If (Mask(fy) and Bit(fx))=Bit(fx
) Goto 550 Else 430
480 Smbit:
490 Mask(fy)=Mask(fy)+Bit(fx)
500 If fx=0 and Cursor(fy)>32767 Got
o 520
510 If (Cursor(fy) and Bit(fx))=Bit(f
x) Goto 520 Else 430
520 Clcbit:
530 Cursor(fy)=Cursor(fy)-Bit(fx): G
oto 400
540 Clmbit:
550 Mask(fy)=Mask(fy)-Bit(fx): Goto
430
560 Action.Pnt:Gosub Mse.On:Poke Gin
tin,7:GEMsys(78):for g=1 to 100:next
570 gosub Mouse.Status:if but<>1 Got
o 570
580 if Fy<0 or Fy>=16 or Fx>15 then
out 2,7:goto 570
590 Act.X=Fx:Act.Y=Fy:for g=1 to 100
:next:poke Gintin,0:GEMsys(78):return
600 Mouse.Status:
610 Poke Contrl,124:Poke Contrl+2,0:
Poke Contrl+6,0:VDIsys
620 But=Peek(Intout):x=Peek(Ptsout):
fy=FNy.pos:fx=FNx.pos:return
630 Mse.On:Poke Contrl,122:Poke Cont
rl+2,0
640 Poke Contrl+6,1:Poke Intin,0: VD
Isys
650 Return
660 Mse.Off:Poke Contrl,123
670 Poke Contrl+2,0:Poke Contrl+6,0:
VDIsys
680 Return
690 Draw.Box:
700 Linef x,y,x+135,y:Linef x+135,y,
x+135,y+14
710 Linef x+135,y+14,x,y+14:Linef x,
y+14,x,y: Return
720 Form.Menu:
730 h=6: Gosub Text.Size
740 x=300:y=16: Gosub Draw.Box:GotoX
Y 35,2: "CURSOR COLOUR"
750 s=02: Gosub Style:Y=34:Gosub Dra
w.Box:GotoXY 35,4:"MASK COLOUR"
760 y=52: Gosub Draw.Box:GotoXY 35,6
:"BACKGROUND"

```



```

770 s=00: Gosub Style:y=79:Gosub Dra
w.Box:GotoXY 35,9:"FILL GRID"
780 y=106:Gosub Draw.Box:GotoXY 35,1
2:"DISPLAY MOUSE"
790 y=124:Gosub Draw.Box:GotoXY 35,1
4:"ACTION POINT"
800 y=142:Gosub Draw.Box:GotoXY 35,1
6:"EXIT PROGRAM"
810 y=16:x=450:Gosub Draw.Box:GotoXY
52,2:"BASIC DATA"
820 y=34:Gosub Draw.Box:GotoXY 52,4:
?"C" DATA"
830 s=17: Gosub Style:Color 1,3,1,4,
2: Fill 1,1,col=1:Color 1,1,1,8,2
840 GotoXY 5,16:" chr$(189)" 1987
Atari ST User ":s=0: Gosub Style
850 Return
860 Text.Size: Poke Contrl,12:Poke C
ontrl+2,1
870 Poke Contrl+6,0:Poke Ptsin,0:Pok
e Ptsin+2,h
880 VDisys(1):Return
890 Style: Poke Contrl,106:Poke Cont
rl+2,0
900 Poke Contrl+6,1:Poke Intin,s:VDI
sys(1): Return
910 Grid.Fill: Color 1,col
920 Poke Contrl,11:Poke Contrl+2,2:P
oke Contrl+6,0:Poke Contrl+10,1
930 Poke Ptsin,0:Poke Ptsin+2,31:Pok
e Ptsin+4,256: Poke Ptsin+6,158
940 VDisys(1): Gosub Grid
950 If col=1 then for i=0 to 15:Curs
or(i)=65535:Mask(i)=0:next
960 If col=2 then for i=0 to 15:Curs
or(i)=0:Mask(i)=65535:next
970 If col=0 then for i=0 to 15:Curs
or(i)=0:Mask(i)=0:next
980 Return
990 Title.In:
1000 t$="chr$(14)+chr$(15)+ " Atar
i ST Mouse Pixel Editor "+chr$(14)+chr
$(15)
1010 t$=t$+"chr$(0):a#=gb: Gintin
=Peek(a#+8):handle=Peek(Systab+8)
1020 x#=Gintin+4:Poke Gintin,handle:
Poke Gintin+2,2
1030 Poke x#,Varptr(t$):GEMsys(105):
Return
1040 Init: Restore 1080
1050 for i=0 to 15: read a%: Y.Grid(
I)=a%: next
1060 for i=0 to 15: read a%: X.Grid(
i)=a%: next
1070 for i=0 to 15: read a: Bit(i)=
a:Cursor(i)=0:Mask(i)=0: next: Return
1080 Data 11,19,28,36,44,52,60,66,76
,83,91,99,107,115,122,131
1090 Data 8,23,40,56,72,88,105,120,1
37,152,169,184,199,216,230,249
1100 data 32768,16384,8192,4096,2048
,1024,512,256,128,64,32,16,8,4,2,1
1110 Grid: Color 1,0,3:for i=1 to 16

```

```

:Linef i*16,08,i*16,137
1120 Linef 0,i*8,256,i*8: next:Linef
0,137,256,137
1130 Linef 0,8,0,137:Color 1,0,1: Re
turn
1140 Basic.Data:poke Gintin,2:GEMsys
(78)
1150 Open "0",#1,"MOUSE.BAS"
1160 ?#1,"1000 Data ";Act.X;";Act.
Y
1170 ?#1,"1010 Data ";
1180 for i=0 to 6:Print #1,Mask(i);
";next:Print #1,Mask(7)
1190 ?#1,"1020 Data ";
1200 for i=8 to 14:Print #1,Mask(i);
";next:Print #1,Mask(15)
1210 ?#1,"1030 Data ";
1220 for i=0 to 6:Print #1,Mask(i);
";next:Print #1,Mask(7)
1230 ?#1,"1040 Data ";
1240 for i=8 to 14:Print #1,Mask(i);
";next:Print #1,Mask(15)
1250 Close #1:Return
1260 Prog.End:
1270 h=6:Gosub Text.Size: CloseW 2:G
osub Mse.On:color 1: End
1280 Reset.Mouse:
1290 Poke Gintin,0:GEMsys(78): Retur
n
1300 Change.Mouse:
1310 Poke Contrl+0,111:Poke Contrl+2
,0:Poke Contrl+6,37
1320 Poke Intin,Act.X
1330 Poke Intin+2,Act.Y
1340 Poke Intin+4,1:Poke Intin+6,0:P
oke Intin+8,1
1350 n=0:for i=10 to 40 step 2:Poke
Intin+i,Mask(n):n=n+1:next
1360 n=0:for i=42 to 72 step 2:Poke
Intin+i,Mask(n):n=n+1:next
1370 VDisys(1): Return
1380 Create.C:poke Gintin,2:GEMsys(7
8)
1390 Open "0",#1,"MOUSE.C":?#1,"chan
ge_mouse()":?#1,"C"
1400 ?#1," int form[37]; /* Latti
ce C users change 'int' to 'short' */
1410 ?#1," ":?#1," form[0]=";Act.X;
"; form[1]=";Act.Y;"; /* X,Y Action p
oint */
1420 ?#1," form[2]= 1;
/* Must be 1 */
1430 ?#1," form[3]= 0; form[4]=1
/* Colours for mask and cursor */
/
1440 ?#1," ":?#1," /* 16 word group
for mask */"
1450 for i=0 to 3:?#1,"form[5+i];"
=";Mask(i);"; ";next:?#1," "
1460 for i=4 to 7:?#1,"form[5+i];"
=";Mask(i);"; ";next:?#1," "
1470 for i=8 to 11:?#1,"form[5+i];"
=";Mask(i);"; ";next:?#1," "
1480 for i=12 to 15:?#1,"form[5+i];"
=";Mask(i);"; ";next:?#1," "
1490 ?#1," ":?#1," /* 16 word group
for cursor */"
1500 for i=0 to 3:?#1,"form[21+i];"
=";Cursor(i);"; ";next:?#1," "
1510 for i=4 to 7:?#1,"form[21+i];"
=";Cursor(i);"; ";next:?#1," "
1520 for i=8 to 11:?#1,"form[21+i];"
=";Cursor(i);"; ";next:?#1," "
1530 for i=12 to 15:?#1,"form[21+i];"
=";Cursor(i);"; ";next:?#1," "
1540 ?#1," ":?#1," vsc_form(handle
,form);"
1550 ?#1," graf_mouse(255,form);"?
#1,"J":close #1:return

```





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## Mark Smiddy meets Peter Johnson, author of Ocean's Wizball

**Y**OU wouldn't take Peter Johnson for a top games programmer. A six footer, with shoulder length blonde hair he looks more like a famous pop star. His interests spread into music and the theatre. Supporting this image, he plays guitar and keyboards in a local band and drives a sleek Astra SRi.

He lives in Gosforth, Tyne and Wear, speaks with a gentle Tyneside accent, and is the author of more than a dozen top-selling games on a variety of computers.

He started programming more than five years ago on the BBC Micro. "My first game was Light Cycles. It was all right I suppose, but nothing really special. The big break came with the release of Overdrive on the Electron. Since then things have just snowballed", he said.

Reviewing Arkanoid, Peter's first game for the Atari ST in the July 1987 issue of *Atari ST User*, Bob Chappel writes; "Arkanoid is one of those games you simply can't stop playing". High praise indeed. More so when you consider it had taken Peter just three months to write.

Now 24, Peter is one of the North East's most promising prodigies. His latest game, *Wizball*, just released by Ocean, is the product of six month's hard slog. "Ocean approached me shortly after I'd finished Arkanoid. I was looking for something I would enjoy playing as much as I would enjoy writing. When they showed me the original, I must admit to being very impressed.

"*Wizball* owes a lot to its design – it doesn't look quite like anything else. Although it wasn't a brilliant seller on the

# Profile of a programmer



*Wizball – one of Peter Johnson's best games*

Commodore, I hope that the superior graphics I've been able to utilise on the ST will give it the edge.

"The game is set in the land of Wiz – a peculiar place, completely devoid of colour. The player takes the part of a mysterious and powerful wizard, charged with restoring colour to the land.

"To do this, the wizard transforms himself into the shape of a ball and leaves his laboratory to do battle. Helping in his quest are many magical items. Some provide armour, different degrees of movement, extra weapons and so on. Initially, the wizard has to locate the drone. This little chap follows him everywhere (except into the wizlab) and collects the droplets of paint.

"When the receptacles are full the wizard returns to his laboratory and mixes the paint. In this way he magically repaints the land of Wiz. Like all games, it's very abstract".

Unlike many of today's ST programmers, Peter designed the graphics and wrote the music himself. This sort of versatility is quite rare. Even simple games usually have separate credits for graphics design, music and programming.

"I believe if a job's worth doing, then it's worth doing properly. The only way to ensure my games come up to my high standards is to do everything myself. Of course, it does take longer this way.

"*Wizball* has hundreds of sprites, each

one carefully drawn using both Degas Elite and NeoChrome. Looking back, it's been a lot of hard work, but I think it's been worth it. I can only hope the game will be as well received as Arkanoid was".

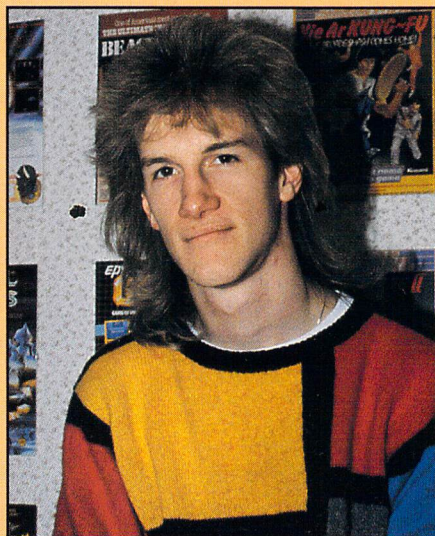
His attention to detail is second to none. The final level of *Wizball* includes a miniature picture of Mount Rushmore forming part of the background. He comments: "If you study it carefully you can even make out the features of the past US presidents. They took a long time to perfect. The final screens do feature some dubious prose... but I didn't write it".

His favourite games for the ST surprisingly do not include many of his own. "Very few games have enough staying power. Many just can't hold my attention for very long, but I have hopes for the future. For instance, very few games take advantage of the extra memory available on the 1040STs", he remarked.

Grinning, he added: "Of course, *Wizball* does. 1040 owners can feel secure in the knowledge that their enhanced version features an extra animation sequence.

"The ST market is still developing, and programmers have yet to learn the machine. At the moment my favourites are Star Wars, Super Sprint and, of course, *Wizball*".

Peter is keeping very quiet about his next ST game. But if his past record is anything to judge by, it should be good.



*Peter Johnson*



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### Bulletin Board update

The MicroLink Bulletin Board has just had a spring clean, and a backlog of 9,000 old messages removed. But at the rate at which it's being used, it won't take more than a couple of months to replace them.

The Bulletin Board is an area where anyone can leave a public message, start or join in a discussion on any topic or just ask for help.

The range of subjects covered is huge and always changing; cars are bought and sold, philosophy, pop music and poaching argued about and the reasons why somebody's software doesn't seem to work are revealed.

There are even the occasional trivia quizzes (well, do YOU know how many electric tramways are still running in the UK?).

There's nothing quite like it outside the world of computers, but be warned. It can be very addictive.

### Preparing for Prime time

EVERYONE upgrades their hardware occasionally, and MicroLink is no exception. But it's not an Amstrad PC1640 they're getting.

For some time now, the rate at which people are joining has put a bit of a

strain on the old Prime 850 computer, and many users would agree that sluggish is perhaps a mild way to describe MicroLink at peak times.

Now work is underway to install a Prime 9955 – not only has it got a longer name but it's faster and better able to cope with the increased demand.

There's a lot of things to be done before the switchover can happen, software has to be changed and the digital detritus collected on the old computer in its years of dealing with us humans has to be cleared up.

Exactly how much better the new service will be isn't clear, although technical people tend to use words like "massively" and get quite excited.

We're all eager to find out...

### The MicroLink User's Manual

ONE of the projects that MUG is coordinating is the production of the MicroLink User's Manual. Designed to complement the information given to every MicroLink subscriber on old fashioned paper, the manual sets out to be an online way of describing the many facilities available on MicroLink from the point of view of the people who use them.

At first, MicroLink can

appear to offer a bewildering selection of things to try, and even for experienced users the different options can be confusing. And there's always a way to do things faster, or at less cost.

Of course, the information to help people do this has always existed. But it's been hard to find, and until now there hasn't really been any way for users to share their discoveries in such a way that others will be able to make use of them. The MicroLink User's Manual sets out to remedy this problem.

At the moment MUG is collating the information. Sometimes the amount of data collected by users can be staggering – one subscriber mailed in over 200k of hints and tips saved up over years. Of course, we're just as happy to hear from anyone with one good idea.

All the data will be indexed and made available; the exact design is still being discussed, but like anything else MUG does, it will be free to use.

### User groups are good news

THE MicroLink Users' Group came about as a result of various subscribers asking whether there was any organisation run to help users.

User groups in any area

are usually good news; they form a focus for ideas, opinion and self-help and give the users a collective voice.

The flexibility provided by MicroLink and Telecom Gold make MUG particularly useful. There are no printing costs for newsletters and there's almost instant access to everyone in the group through the mail system.

MUGs been going for about a month now, and we've already formed a team of people who have volunteered to answer queries and help anyone with MicroLink-related problems.

### It's a small world...

... but full of Telecom Gold computers, it seems. The UK Telecom Gold system, of which MicroLink is the most active part, is just one sector of a global network called Dialcom.

While MicroLink is System 72, and other UK computers are in the range 70 to 90, there are Dialcom computers almost everywhere. And like international telephone exchanges, they've all got their own numbers.

MUGger Adrian Mars is trying to find out just which computers are where. This might seem an eccentric, if harmless, hobby, but such information as is available on MicroLink is difficult to find and (apparently) out of date.

And it could be the first step to organising an international group of Dialcom users, which really would be a first and another step towards the electronic community of tomorrow.

If you know anything about the Dialcom network numbering scheme, then Adrian (MARS.ADRIAN on the mail system) and MUG would be glad to hear from you...

### Odd offers

THE prize for the most unusual use of MicroLink goes to ... well, nobody knows. But the last month has seen some odd goings-on.

There have been people advertising for goose shooting, others looking for burned out buildings and the usual range of online floral orderings to persuade moth-

ers and lovers that computers aren't so bad after all.

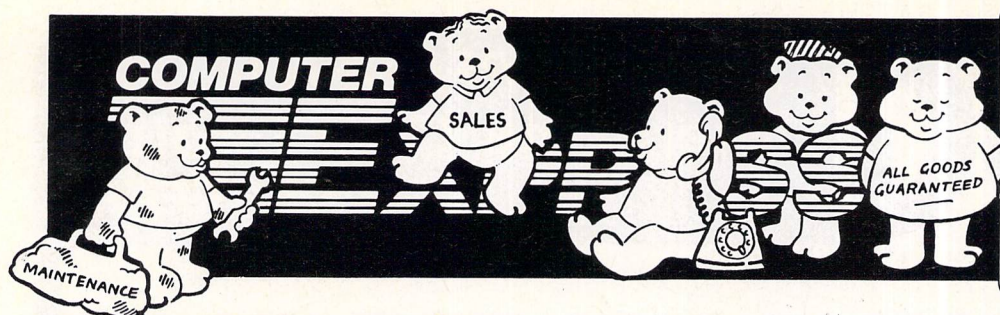
But you have to take your hat off, if nothing else, to Keith Channing. He helps run CORAL, Clothes Optional Recreation and Leisure, a naturist organisation dedicated to promoting the various activities enjoyed by those who feel happier without their

clothes on. And with a bit of advertising on the Bulletin Board and a touch of help from MicroLink themselves he's gathering together all those on the system who are similarly inclined.

Now that has to be the most original use for MicroLink.

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# Mini sprite designer

**C**REATOR, by Red Rat, is a simple sprite editor aimed at the budget end of the market. The package will enable you to design characters and use them in your own programs – either using your own sprite routines or the ones supplied with the software.

The package contains one single-sided disc and a 10 page manual. It runs on all STs from 520 to Mega and in low resolution colour. It's fine on a TV or colour monitor and everything is easy to read.

The illustration below shows the main editing screen, where most of the work is carried out. The sprite currently being designed is displayed magnified about 16 times normal size in a large editing window on the right of the screen.

The palette is shown at the top-left corner of the screen and the RGB value of each colour can be altered by pointing at the R, G and B in the boxes below. A colour is selected by pointing at it with the mouse and clicking the button. You can then move to the edit window and paint by moving the mouse while holding down the button.

The Fill option, just below the RGB display, is used to fill the edit window with a single colour. It wipes out whatever is currently there and fills the whole window. This is such a potentially destructive command – you will lose whatever has been drawn in the edit box – it would have been better to have a warning and an "Are you sure?" prompt.

The contents of the edit box are shown real-size in an adjacent box surrounded by large four arrows pointing up, down, left and right. These icons scroll the sprite with wrap-around – what disappears off one border reappears on the other – in the directions indicated. The window can also be flipped vertically or horizontally.

The sprite in the edit window can be stored in Creator's font (a small portion of this is shown in the bottom-right corner of the screen below the edit window). And any character in the font can be copied to the edit window by clicking on it.

The characters in the font can be scrolled left and right so that the whole lot can be brought on to the screen. A font can be loaded from or saved to disc by clicking on the Load Font and Save Font icons.

A scratch-pad, called the edit screen, allows you to select sprites from the font and place them anywhere on the screen. It is an essential part of the program, as the edit window can only be used to edit a 16 by 16 pixel block. This would be a very small sprite, so to get round this

**Julie Boswell reviews  
a budget-priced sprite  
editor and animator**

handicap you can use them as building blocks to create much larger ones.

It's often difficult to visualise what a large sprite looks like when you can only see a small portion of it, so the edit screen enables you to manipulate the blocks on screen so you can see what the finished sprite looks like.

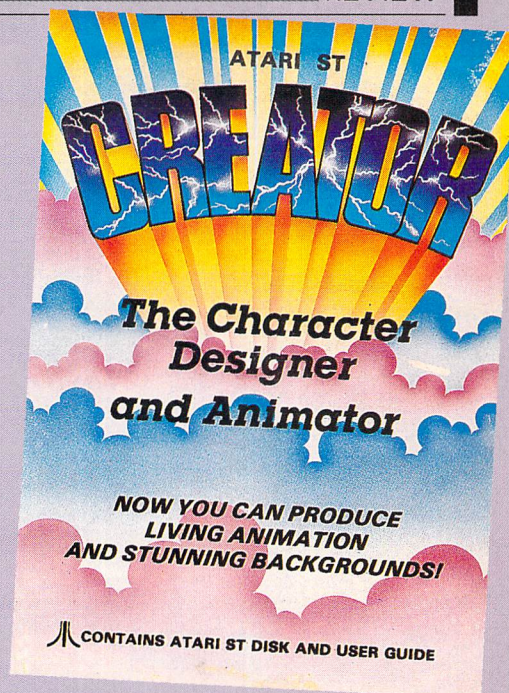
This still isn't ideal though, and it would have been far better to have a much larger edit window so you can see more, if not all, the sprite being worked on.

Fortunately there is a solution: The program allows you to load a previously drawn NeoChrome or Degas picture and to grab 16 by 16 pixel blocks from it. This enables you to design large sprites using a full screen editor and to then load them into Creator.

Having designed your sprites, they can be animated by selecting the Animate icon from the main screen. This brings up a second screen which is blank apart from a menu at the bottom. Here you can set the number of frames of animation, the delay between each one and the size of sprite.

The size consists of the number of blocks making up the sprite and their order, chosen from a predefined list of seven sizes from 1 x 1 up to 3 x 3 blocks. The sprite is then animated in the centre of the screen until you hit the spacebar.

Finally, clicking on the Data icon on the main screen allows you to save the sprite as data statements in Ascii form. The



options available are Fast Basic, ST Basic, C and assembly language. The file created can then be tagged on to the end of your game or whatever.

Unfortunately, Creator saves the data for each individual 16 x 16 pixel block separately, taking no account of how they are put together to make up the sprite which reduces its usefulness quite drastically.

For some reason, response to the mouse buttons is quite poor and I experienced quite a few problems getting it to accept a click. You have to make each selection slowly and deliberately and this can be a nuisance at times.

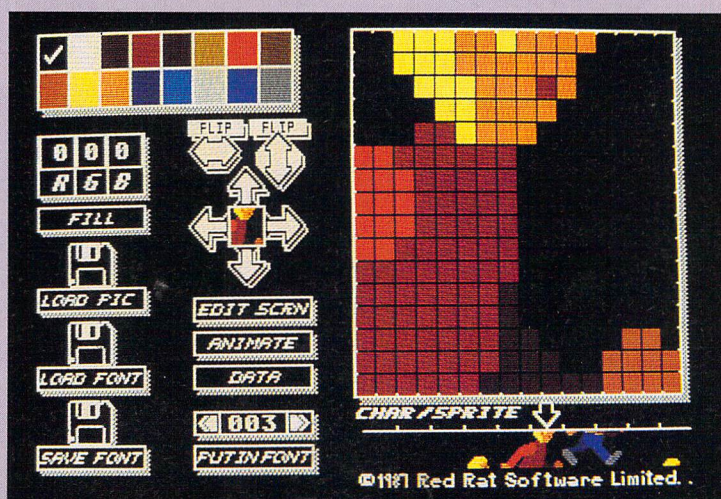
Creator is a fairly simple, basic sprite designer. Its main failing is the small size of the editing window, making it difficult to draw large characters. If you can put up with this restriction – and it is very restricting – then it's quite good value for money.

Product: Creator

Price: £9.95

Supplier: Red Rat, 15 Fennel Street, Manchester M4 3DU.

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Creator's main editing screen





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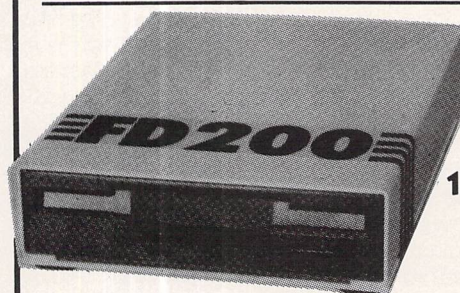
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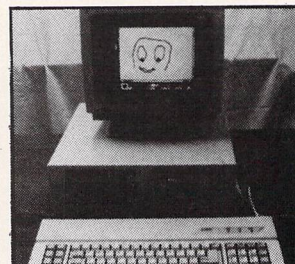
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# A DVENTURES

Brillig lends a hand in solving problems for fantasy fans

## Don't say that you haven't been warned...

**S**OME of you may have wondered why last month I made disparaging references to Domark's Not A Penny More, Not A Penny Less. Although space did not permit me to cover this so-called adventure fully in previous issues (why give coverage to mediocre stuff when there are plenty of good adventures crying out for review?), it's only fair to give you some idea of why I think NAPMNAPL to be such a naff game.

Descriptions of objects and locations are pitifully terse and the vocabulary and parser are nothing short of dire. Snatches of digitised speech do nothing at all for the game. You begin in your rooms in Oxford and are told there is a desk, TV, phone, some books, a cupboard and a folder.

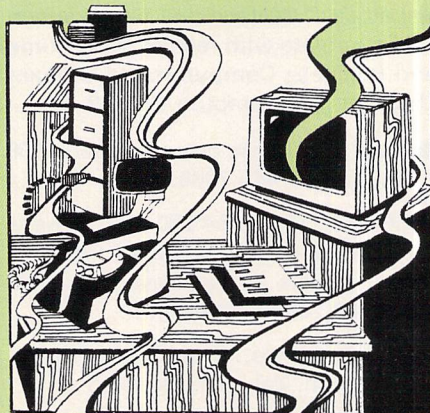
Try opening the desk and you'll be told "Stop wasting your time". Read the books - "Stop wasting your time" (READ BOOK - singular - produces something, but OPEN BOOK doesn't).

In fact, many actions you would take for granted in most adventures will not work in this one. If the program doesn't like your command (and there aren't many it does), you'll be told time and time again, "Stop wasting your time". However, just for a change, the program also occasionally responds with "Don't be silly" or "I beg your pardon, old bean?" to what I consider to be perfectly reasonable inputs.

And guess what? There's no inventory command, so you have no way of knowing what you've collected. You can't drop anything, either. Not that it really matters - the whole program is so illogical and unpredictable that these inconsistencies are barely noticeable.

For instance, if you open the cupboards you'll hear a hissy voice intone "You shee shome drink, shome magazines and a photograph album". Take everything, close the cupboard then open it again and what happens? Yes, "You shee shome magazines ...".

This can go on forever. Even dafter, you don't even have to open the cupboard to, say, read the magazines. NAPMNAPL will quite happily let you do silly things while stopping you from



doing sensible ones.

At one point there was a knock on the door, heralded by the voice - "Before you can do anything, there is a knock at the door". When I opened it, in walked a policeman. He left soon after, but when I subsequently opened the door, even though there was nobody

knocking, in he came again - and again, and again. And so it goes on.

Heaven help any player new to adventures who has bought this game - it would put them off for life. So now you know and can't say you haven't been warned - NAPMNAPL is a stinker.

Now to far better things.

Top honour in this month's column simply has to go to Anthony Webber and Matthew Carmody of Chew Stoke, Avon for their sterling work on Guild of Thieves and Jinxter.

They have sent in complete and detailed solutions to both these adventures and, although there's no prize for being first with Jinxter, they at least have the satisfaction of being given honourable mentions by Brillig. Now what greater glory can there be, lads! Well done both of you - now how about a full solution to Space Quest II, eh?

Thanks also for your tips go out to

## HINTS AND TIPS

### THE PAWN

(continued from last month)

In the chamber with the dragon, shine white at shadows. Go North. Throw potion bottle at Kronos. Press nozzle. Look inside top hat. Examine rabbit and rack. Get pointy hat, wand and cloak. Wear cloak and hat.

Go to hell where devil waits. Give him the aerosol. Go to entrance by small cave near laboratory. Open doors. Go South. Knock on door. Say NO. Go South. Examine listing. Type in the word DEBUG.

Go to cavern near lava river. Move

pedestal and get key. Go to snowman. Melt him with white. Go to the store. Get spiky boots and wear them. Get prism. Unlock door on landing. And that's all I'm telling.

Once you've examined the listing and typed debug, you can keep on experimenting and exploring without getting killed.

You won't have got all the points but at least this partial solution should have helped you through most of the problems.

Why not start again now and tackle it more comprehensively? But before you do, try typing debug and going past the southern edge of the adventure.



Roger Mann of Orpington for King's Quest III, R. Marshall of Congleton for Knight Orc, Paul Stapley of Whitby for Jinxter and Dave Smith of Moffat for his solution to Stationfall.

John Robinson of Skelmersdale wonders if a stand-alone version of MUD (Multi-User Dungeon) is planned for the ST. Rumours are always flying around, but I know of no definite plans to bring MUD to the ST. Does anyone know different?

Andrew Lackenby has asked, via MicroLink, whether anyone has managed to recruit the troll in Knight Orc. To outwit it, collect as much silver as you can, let her steal something from you, move away (she should follow), repeat until you're a long way from the bridge and almost out of treasure then drop your remaining items and race back to the bridge, open the door and enter the lair. Get the wallet, keep it subdued and command the troll.

Coming shortly to an ST near you are two superb new adventures, from Mindscape courtesy of Mirrorsoft, called *The Uninvited* and *Shadowgate*. Both are in the style of *Déjà Vu* (reviewed in the February 1988 issue of *Atari ST User*).

*The Uninvited* has you crashing your car outside what turns out to be a very strange house. Stay in the wrecked car too long and you won't even start the adventure – you'll be burned to a crisp.

Thunder and lightning play about your ears and somewhere nearby a dog howls as you nervously enter the Gothic mansion, the door squeaking loudly on its hinges. It then slams noisily behind you, locking you inside – permanently. There's no going back now.

A headless ghost and a fearsome femme fatale are but two of the early unpleasant encounters you'll have in this macabre and mysterious house. The main objective is survival – and that will take all your wits, believe me.

*Shadowgate* concerns the booby-trapped and moldering ruins of a fortress wherein there be dragons – not to mention banshees, ghosts, slime, trolls, wraiths, wizards and assorted monsters. *Shadowgate* has plenty of tricky puzzles – for example, can you survive the fiery breath of the dragon guarding his golden horde or obtain the skeleton key from the middle of a shark-infested pool?

Great sound effects, animation and graphic detail, excellent game handling and gripping plots make these two adventures a must for all fans. Watch this space for a full review as soon as they hit the streets for the ST.

# Take care – or die laughing

Program: *Jinxter*

Price: £24.95

Supplier: Rainbird, First Floor, 74 New Oxford Street, London WC1A 1PS.

Tel: 01-240 8838

I NEEDED no more than about 30 minutes play to realise that here was another sure-fire winner from the superlative team of Rainbird and Magnetic Scrolls. *Jinxter* is another excellent text and graphics adventure from the same people who brought you the award-winning *Pawn* and *Guild of Thieves*.

*Jinxter* has been co-written by Michael Bywater ("Punch magazine's master of wild invective", lauds *The Times*) and the Magnetic Scrolls development team. The game is poles apart from the usual witches, wizards and warlock type of adventure. It's very funny for one thing and for another there is nary a smidgeon of hacknied hobbits, tiresome trolls or boring berserkers.

This jolly jape is set in Aquitania, a green and pleasant land blessed with luck and laughter, a land where acci-

dents and misadventure never dare show their miserable faces.

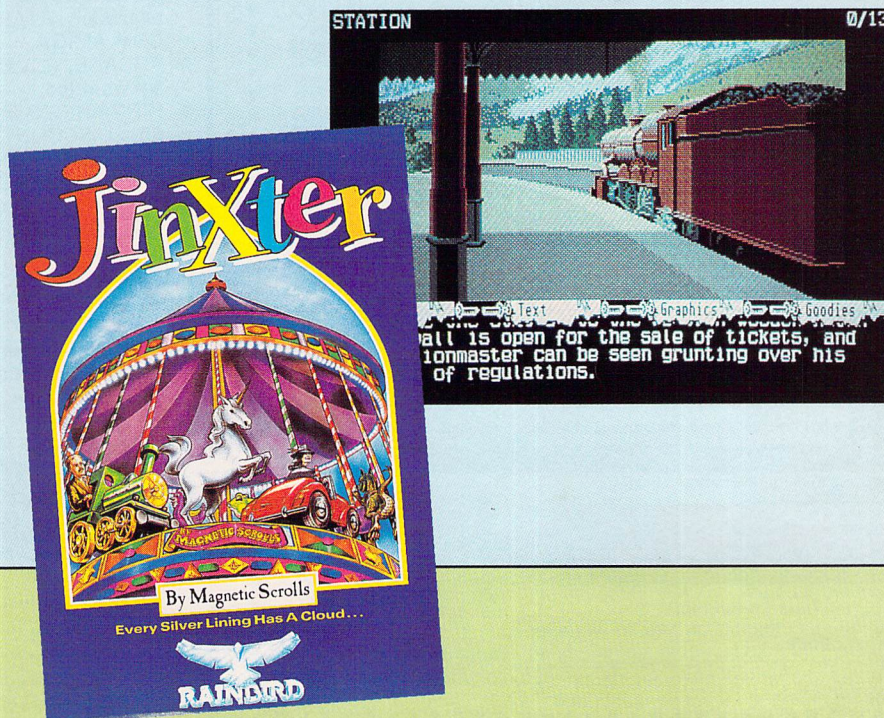
But all this good fortune and general well-being has not come about by chance. As with many tales of fantasy and fable, there is often a worm in the apple. In this case it's several worms, going under the collective name of the Green Witches.

Said witches are always looking for ways of causing trouble but are kept in check by the magical powers of a special charm bracelet. Should anything untoward happen to this bracelet, those mischievous green warts might start up their nonsense again.

And now, by an amazing coincidence, just as you turn up in your local shop to buy *Jinxter*, the bracelet is nicked and its charms scattered to the five winds. Having bought the game, you have no choice now but to assist by recovering the charms and so prevent the said green hags from getting too uppity.

The giggles come in many guises. For

Turn to Page 71 ►





## ◀ From Page 71

example, one of the characters you'll meet from time in Jinxter is the Guardian from Beyond the Realms of Time. Rather like the Master Thief in Guild of Thieves, he makes several appearances throughout the game.

This Guardian however, doesn't wear long flowing robes or carry an impressive sceptre and is nothing like the wise and imposing sage you might reasonably expect him to be.

Instead, he's a sullen and reluctant time-server attired in a herringbone overcoat. Think of a less articulate Arthur Daley and you'll have some idea of the character. "What's the point of wosname, immortality", he grouses, "If you can't get a decent bit of cheese in your sandwich, narmean?"

Although his vocabulary lacks something in breadth, you'll find there are places where you'll need to emulate it. For instance, the charms have to be referred to as the doodah, thingy, oojimy, watchercallit and doofer when you want to cast a spell with them.

As the Guardian so succinctly puts it,

your task is to "Just find the watchercallit, say the doodah and thingie's your wosname. Charm. Word. Bob. Uncle. Narmean?"

The characters and puzzles in Jinxter really make the game zing. There's a Billy Bunter of a baker who won't take you on as his assistant until you've learned how to bake a decent loaf. The cantankerous village postmistress thinks she's Calamity Jane – and just how do you stop her doorbell from ringing?

Who is responsible for all the bizarre goings-on in your house? And what can you bung in the hole in the canoe – I looked high and low for old Glitch, thinking he was perfect for stuffing into a crevice, but no luck. The mouse is an adequate substitute, but if you use it you won't be able to solve a later puzzle.

The text is rich and witty and there is an attention to detail that very few other adventures can match. The folding deckchair, for example, has bloodstains on it – if you've ever wrestled with a deckchair, you'll know how they got there.

The ticket inspector on the bus, the North-facing conservatory, the Whicker


chair, the benches in the pub garden, the gravel path and the plum roll are just a few of the many items which will well-reward an examination. Try dialling some well known numbers like 999 or 192 on the phone for further examples of the depth and wit of Jinxter.

The graphics are even better than those in The Pawn or Guild of Thieves, so you'll realise how good they are. If you have one of the first releases of Jinxter, a word of warning about a bug. Attempting to go South in the pub causes the screen to fill up with the word AND and the game to lock up. You don't need to go South in that location to solve the game, so don't! Later versions are bug-free.

Many delights and surprises await you in Jinxter, an adventure in which the only harm you can do yourself is from laughing or head scratching.

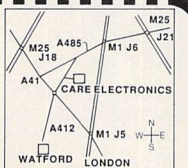
Three hits in a row for Rainbird – now that can't be luck.

<b>Presentation</b> .....	<b>10</b>
<b>Atmosphere</b> .....	<b>9</b>
<b>Puzzlement</b> .....	<b>10</b>
<b>Value for money</b> .....	<b>10</b>
<b>Overall</b> .....	<b>10</b>



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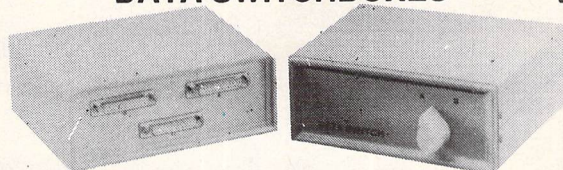
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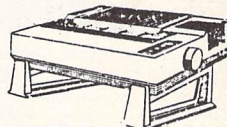


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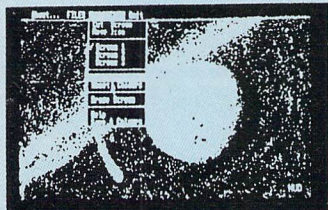
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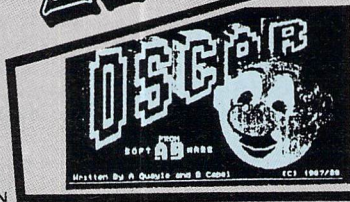
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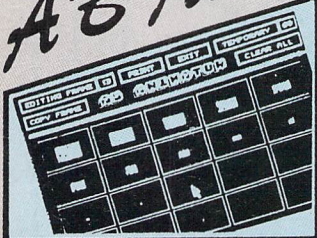
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**S**EVERAL educational packages have recently been launched by Ladbroke Computing International and Microdeal. It is nice to see someone taking an interest in the growing ST educational market.

Add with Oscar and Spell with Oscar, both for the 5 to 10 age range and distributed by Ladbroke, are representative of a wide range of educational software programmed by AB Software in England.

These two programs offer various levels of difficulty and at first the younger child may need guidance as to which level to select. Spell with Oscar presents a title screen which then dissolves and reforms into the main work screen.

The top third of the display is the viewing area consisting of a sky with a clear backdrop. Underneath is a horizontal brick wall and below are display features – the word box, a small animated face and the score. The bottom area of the screen contains the letters of the alphabet in large clear letters with highlighted vowels.

The program is simple but effective. A sprite representing a word moves smoothly right to left across the screen, travelling along the top of the wall. The word display box contains a white dotted line, and a number indicates the number of letters in the word.

The keyboard is used for selecting the letters making up the word and each key-press is mirrored on-screen. If a given letter is correct it appears on the line and the face nods, otherwise it shakes. Once the word has been correctly spelt a short piece of music is played and the icon moves rapidly off screen.

An automatic facility flashes the correct letter when the sprite reaches half way across the screen before the child has correctly identified the word.

Add with Oscar uses a similar refreshingly simple concept. The lower edge of the screen contains the numbers zero through to nine and the larger part of the display is taken up by a blackboard. Instead of the usual mouse pointer a clearly identifiable piece of chalk is used to make selections.

The sums are displayed in a traditional mathematical manner, drawn on the blackboard by the chalk. The face is again animated according to the answer, and a correct one produces a catchy piece of music. There is also opportunity for the child to register on the high score table.

The package from Microdeal, Preschool Kidprogs, is for the two to six age range and has its origin in America. It presents three diverse activities, each of educational value, according to the child's ability – an on screen multi-sided block puzzle, a musical keyboard supported by pre-programmed tunes and a pattern drawing program.

The three programs – Kidblocks, Kidkeys and Kidgrid each fully utilise the mouse. The master program loads auto-

# An Oscar for education

**Three new educational packs aimed at young children are put to work by John Martin**

matically, which is a good idea for children and each program presents a bright, clear and colourful working screen.

Considerable thought has been devoted to the safe and logical way in which the child moves from one feature to another. There seem to be no sudden death selections, and this is to be commended.

Kidblocks is a 16 block puzzle. Each block is in the correct location, but is chosen from one of several different pictures. Selecting a block – by pointing and clicking the mouse button – displays another block from another picture. The reward for selecting the correct blocks is that the final picture is animated, sometimes with a musical accompaniment.

Kidkeys is a piano or organ keyboard – you can choose either – which allows the child to select a tune from 20 icons representing well-known nursery rhymes, or to play a tune of their own. While the tunes are simple, they are clear and readily recognisable. As the notes are played the keyboard keys are highlighted.

Kidgrid is an unusual drawing program

in which the screen is divided into 192 triangles, each of which can be filled with one of 12 colours to construct patterns or drawings. You can select a colour and paint a triangle simply by using the mouse.

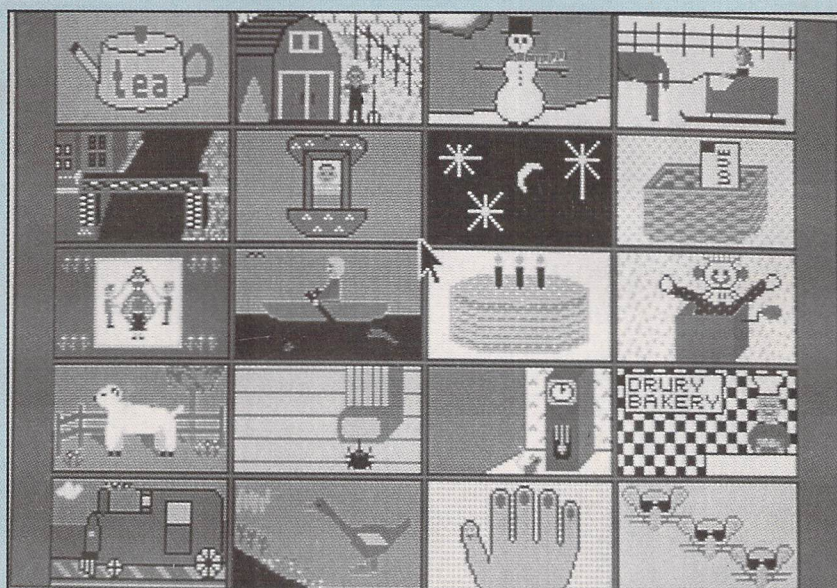
All three programs live up to their promotional claims and each offers features aimed at stimulating the child in many different ways. The fun element is difficult to assess, but certainly all the children I watched using the programs were enthralled by them.

Sound has been wisely used – though the tunes at times sounded a little off key to my ears – and the graphics are clear and distinct.

Copy protection has not been applied to any of the programs, and rightly so, since children offer a hostile media environment – nothing is safe from exploring fingers. As a parent I look forward to future releases in these ranges.

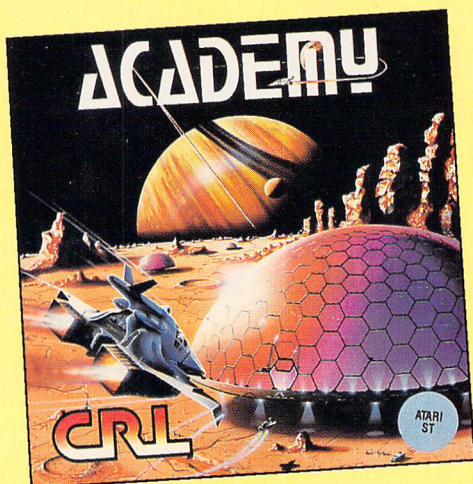
*Product: Spell with Oscar, Add with Oscar  
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Tel: 0772 21474*

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*A refreshingly simple concept*





# Stars shine in the Zen Room

**T**HAT well-known software company CRL was set up in 1982 by its present managing director Clement Chambers while he was still only 18. A computer enthusiast, he saw the growth potential of the industry, which was still very young at the time.

To get things going he took out an advertisement for freelance programmers in a computer magazine that November. The response was excellent and led to CRL marketing its first programs for the ZX81 and Spectrum.

By the end of 1983 it had produced a string of successes including Rescue, Derby Day, Handicap Golf and Test

**Robin Nixon reveals the history behind one of the oldest software companies around – CRL**

Match – which was the biggest selling title for CRL until 1985 when The Rocky Horror Show followed by Tau Ceti took over that position.

At first, Clement was not only managing director but also sole employee of the company. Then business increased during the first quarter of 1983 and it

became necessary to take on two employees.

They were a secretary/receptionist to handle the large numbers of calls and Tim Vernon who started as a general assistant but became the international sales director before he left in 1986.

Its expansion continued and by the end of 1983 it had a team of in-house programmers. In July 1984 CRL had been so successful it went public and moved to larger premises of 2000 square feet. During that year the main releases included Glider Pilot, Glug Glug, Omega Run, Grand National and many more.

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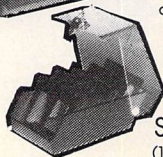
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produce more games with greater quality CRL hired a graphics designer, and on Tim Vernon's departure recruited Greg Duffield to take over his position.

1986 saw the creation of two new labels. The first was Nu Wave which was set up with a catalogue of innovative and experimental software, aimed at computer owners who were tired of the usual arcade and adventure games and were looking for something different. The second was Alpha-Omega, which was later re-launched as The Power House and is beginning to make inroads into the budget market.

In 1986 CRL moved again to even larger premises (5,750 square feet) which it named the Zen Room, Mike Hodges joined that year and became the new creative director and the following games were among their major releases: Blade

Runner, Space Doubt, Pilgrim, SAS Raid and The Image System.

One game which was released in 1986, Dracula, claimed a first in that it had a 15 certificate slapped on it – much to CRL's delight, as it meant even more copies were sold than expected, due to people wanting to see what was so gory. Since then, probably because the blood and guts was so successful, it bettered that feat with Jack the Ripper and its 18 certificate.

Now, CRL is six years old and has outlived virtually all its original competitors. How has it survived? More to the point, how has it done so well that CRL is now a PLC and its software is consistently at the top of the charts?

Having spent a day with the company, I would say one of the answers is the dedication of everyone involved. The atmos-

phere is very friendly, and it seems that they're always bouncing ideas off each other in a sort of creative, ordered chaos.

The programmers have their own stereos by their micros and there's a store of mattresses in the back room ready for crashing on after a hard night's programming. Apparently they are used quite often as the programmers almost live and breathe the software they're creating.

Mike Hodges introduced me to some of the team, all of whom enthusiastically demonstrated the various projects they were working on. Some of the software they're writing for the ST is brilliant with the best sampled sound I've heard so far.

Another reason for CRL's success lies in Clement Chambers himself. He has a vision for the future where software houses, film and TV companies and the record industry will combine to produce total experience games. He says that as soon as the home micro's power is big enough CRL will be there at the forefront.

Imagine a game with the graphics of Star Wars or 2001 having a one hour stereo sound track, using modern film and record production techniques. According to Clement this isn't too far away.

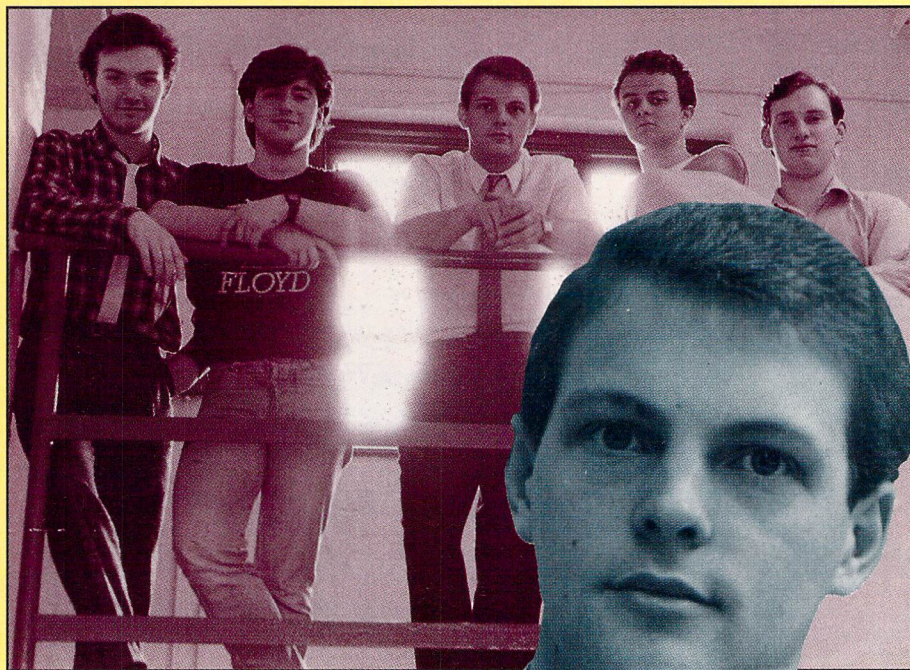
An insight into his world can be gained through some of the things he says. While we were at the pub for refreshment at lunchtime (having been driven there in the plush company car – number plate CRL 1) he remarked on how he felt he was becoming a dinosaur, and had visited the Natural History Museum to see some others (presumably so he could make sure he wasn't resembling one too closely).

To keep in touch with the younger generation – he's only 24! – he buys records by the Beastie Boys and other new groups – not that he particularly likes them, but that's what a lot of kids are buying at the moment.

But it's not only Clement who runs the show. He, Mike Hodges and the rest of the team pool their ideas to come up with software they believe in, and work hard to achieve a finished product as near to the original specification as possible.

CRL is a company that has really gone places and has its mind set firmly on the future. Look for many more top quality releases emerging from the programming den at the Zen Room.

*Creative  
director  
Mike Hodges*



*From left to right: Jeff Lee, Jay Derrett, Mike Hodges, Jon Law, Andy Stoddart*



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# Gem 3 adds polish to DTP system

**Now that Timeworks has upgraded its desktop publishing package, Bruce Smith reports on the latest features and changes**

**S**INCE my favourable review of GST's Timeworks Desktop Publisher in the December 1987 issue of *Atari ST User* a new upgraded version of the software has been released. I jaunted up to the Fens to have a look at it.

There are several major innovations in the software, the majority of which are a direct result of running it under the latest release of Gem - Gem 3 - which has been fine tuned to run much faster than earlier versions. This is supplied with the new Timeworks package.

From a user's point of view this speed increase is quite considerable, but more pertinently, GST has managed to reduce the overall size of the software to allow it to run on a minimal system - a 520ST with single disc drive. Previously one megabyte and dual drives had been required.

The way in which Gem 3 handles fonts has been altered quite significantly. Previously they had to be loaded into precious ram space, bringing two

drawbacks. First they eat away memory at an alarming rate and second, because of this the number that could be installed is drastically reduced. This state of affairs is not an ideal situation when it comes to using DTP software, the output from which relies on these fonts.

Gem 3 handles fonts dynamically, loading them from disc into a predefined font cache area of memory when required. As the format of the fonts is more compact, the number that can be loaded into memory has been greatly increased.

Being dynamically loaded, the Gem 3 software does need to have continual access to the fonts disc. Clearly this way of working is intended more for a hard or dual disc drive system. Single drive users will find, therefore, that the number of fonts available for use is slightly smaller than it might otherwise be.

A wider range of fonts is now available, including the standard Times and Helvetica look-a-likes called Swiss and Dutch, plus Maddison and Drury Lane (Broadway and Broadway Engraved look-a-likes), Ravina (Script), Rockface (Rockwell) and a graphic font called Bullets.

Type sizes range from 7, 10, 12, 14, 20, 28, 36, 40, 56 to 72 point, which will cater for most needs. Most notable of these is the inclusion of the 12 point face which was a major omission from the first release. In addition to standard bold and underlined text, italic, light, outlined,



*A sample page produced using Timeworks' Desktop Publisher*

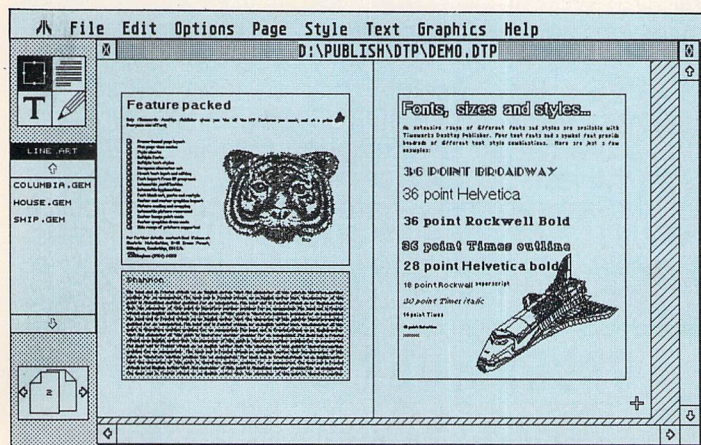
super and subscript are also available.

Users of the Atari laser printer will particularly notice the improvement in font handling as it frees the 200-300k of ram normally required by the printer to handle printer fonts.

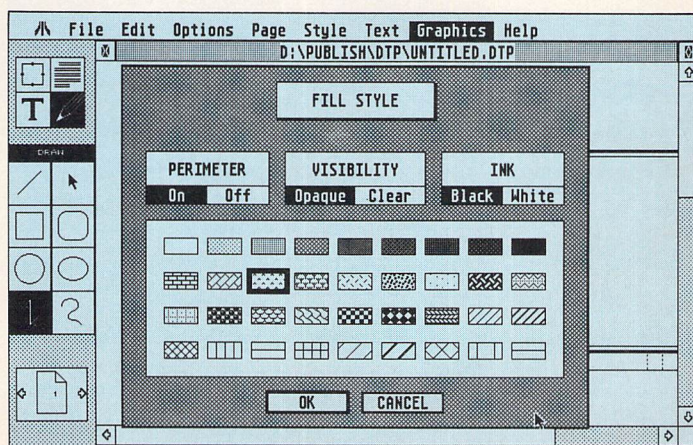
A good range of graphics tools were available on the first release and these have been extended to include a base set of four frame surrounds which can be placed around pictures or text.

Also included in the first release, though not mentioned in my earlier review as it was added after I wrote it, is a bit-map editor which allows images to be

**Turn to Page 82 ►**

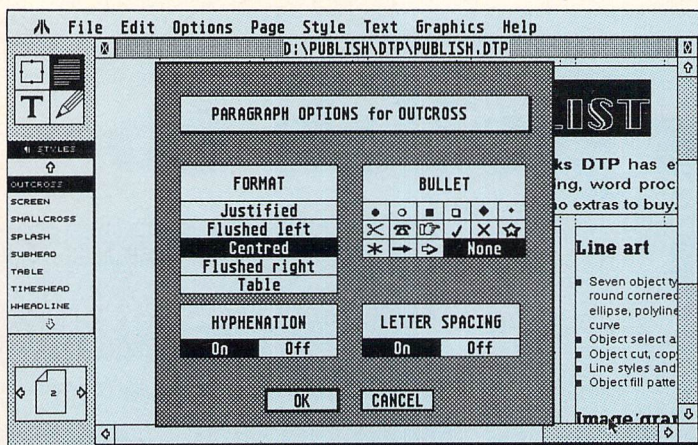


*Previewing the finished pages*



*Choosing a fill style*





Setting the paragraph options

#### ◀ From Page 81

fine tuned and cleaned up once loaded.

Text and graphics frames were previously drawn and positioned by eye. The new release provides a dialogue box which may be filled in with coordinates to allow frames to be placed accurately to within a fraction of an inch – an important asset particularly if the final result is to be output to a quality typesetting device.

Printer handling is further improved – a direct result of Gem 3. Output can be to virtually every type of output device including 9 and 24-pin dot matrix printers, all types of laser printer, and as PostScript is supported, top of the range imagesetting devices. A Timeworks DTP document does not have a size limitation other than those imposed by the physical restrictions such as disc space.

The speed of the program is remark-

able. Scrolling with pictures on screen is virtually instantaneous as is re-flowing of text in re-sized frames. GST has used the standard, but often unused, blit routines at the heart of Gem, unlike other Gem-based programs which use the other slower Gem mode routines.

A word also about the wysiwyg display. When a whole page is previewed it obviously has to be miniaturised to display it on screen. For this reason text is normally greeked – a term meaning unreadable – and with words often being shown as small oblong blocks to give you a flavour of the screen layout.

GST has gone one step further by designing a miniature font especially for display in full page mode.

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I AM concluding my 68000 series by showing you how to make the most of your assembly language programs and giving you some useful tips about how to cope when things go wrong.

When we write our programs we are usually far more concerned with getting our routines to work than with considerations of efficiency. After we have removed most of the bugs, we can then modify the program to our heart's content, secure in the knowledge that the basic structure is correct. This process is known as optimisation.

The easiest way to optimise 68000 assembly language programs involves the use of special operations known as the quick instructions. These correspond to the increment and decrement instructions found on most other processors which quickly add or subtract one from a register.

In the 68000's case however, they have been expanded slightly to enable you to use numbers from one to eight. Here are a few examples of this sort of instruction:

```
ADDQ.W #5,D0    Quickly 5 to D0
SUBQ.W #3,D3    D3=D3-3
```

You can also use these instructions in conjunction with most other addressing modes:

```
ADDQ.L #1,A0
SUBQ.B #7,(A0)+
```

The only difference between the quick instructions and their normal equivalents is the restriction in the size of the number to be used, and the fact that it must be specified directly as part of the instruction. So you can't use something like:

```
ADDQ.W D0,D1
```

even if D0 contains a number in the correct range. The first number in the instruction must be immediate.

Another instruction of this type is MOVEQ, which takes a single, byte-sized number and moves it at great speed into any one of the eight data registers. The format of this instruction is:

```
MOVEQ #100,D0
```

Note that the extension used in this instruction is LONG and that you are not allowed to choose the size of this operation explicitly. It's also important to be aware of the fact that MOVEQ assumes the immediate number to be moved is signed, that is, between -128 and 127.

Although you can in practice use numbers as large as 255 with this instruction, errors will creep in if you then try to manipulate this data using word or long word operations.

Some assemblers such as the Fast Basic one automatically translate any

# Assembling to good effect

**Stephen Hill rounds off his assembly language series with a selection of hints, tips and help**

operation into its short form whenever possible, but others such as Hisoft's Devpac leave the exact choice of the instruction up to you.

While on the subject of alternatives to normal instructions, it's worth mentioning that the original design of the 68000 assembly language specified special instructions for directly accessing an address register. Typical examples of such operations include:

```
MOVEA.W D0,A2
ADDA.W #4,A7
SUBA.L #10,A6
CMPA.L #100,A1
```

There was also an additional set of Immediate instructions:

```
ADDI.W #10,1000
SUBI.W #11,(A0)
CMPI.W #15,0(A4)
```

The idea behind this approach was to improve the execution speed of the 68000 by splitting operations involving different sorts of information into separate instructions. One unfortunate side effect of this, however, was to make the 68000 slightly more unwieldy to program.

Because of this, most modern assemblers avoid this problem altogether by automatically choosing the correct alternative for you, depending on the addressing modes used in your instruction. This means that these two instructions generate identical 68000 machine code:

```
ADDA.W #4,A7
ADDA.W #4,A7
```

It's useful to remember this fact when typing in listings from books, as many of them, particularly the ones from Abacus, use the old forms in their examples. If you encounter such instructions you can either remove the I or the A by hand and save yourself some typing, or input the program text as it stands, since the majority of assemblers will accept both formats.

I'll now briefly discuss some of the problems you may encounter when

attempting to incorporate assembly language routines into your Basic programs. If you use a version of Basic which includes an assembler, such as Fast Basic, this process is fairly straightforward, but otherwise you'll probably have encountered a number of difficulties.

The worst arises from the fact that you rarely know where in the ST's memory your program will be run. Take the following fragment of assembly language:

```
MOVE.W one,D0    D0=PEEK(one)
MOVE.W two,D1    D1=PEEK(two)
ADD.W D0,D1      D1=D1+D0
RTS
one DC.W 1
two DC.W 2
```

The labels whose addresses are represented by *one* and *two* are automatically calculated when this program is assembled.

But the values these labels will take inevitably depend on where the program will be loaded into memory, and at the time of assembly this is unknown.

Of course you could allocate some space for your program first. You would then tell your assembler where your code should be loaded, using a pseudo operation known as ORG (short for organise):

```
ORG 1000    Store at 1000 onwards
```

This would enable the values of labels *one* and *two* to be inserted directly into the appropriate instructions during assembly. Fast Basic uses this technique to great effect.

Other assemblers, however, adopt a slightly different procedure, placing additional information at the start of the machine code. When such a program is loaded using Tos, this data can be used to set any absolute addresses in the program to the correct value.

Unfortunately only a few versions of Basic support this facility. So unless we can specify precisely where our program will be loaded before assembly, it won't work.

The solution to this dilemma, lies in a useful addressing mode known as PC relative addressing. We have, in fact, already encountered this when we dealt with the branch instructions. These add

**Turn to Page 84 ►**



## ◀ From Page 83

an offset to the current position of the branch to calculate the address of the next instruction to be executed.

Similarly, we can usually use PC relative mode to replace any absolute addresses in our program:

```
MOVE.W one(PC),D0
```

The offsets used are, as you would expect, generated for you by your assembler. Many assemblers will also allow you to omit the (PC) completely. These attempt to use PC relative addressing whenever possible, and only stoop to using absolute addressing when it cannot be avoided. So you could happily run the example code fragment anywhere in memory.

There is, I'm afraid, one slight snag with PC relative addressing. Certain instructions don't always allow you to use it. A particularly nasty example of this is MOVE, which is unable to move any data to a relative address. This means an instruction like:

```
MOVE.W #1,one(PC)
```

is illegal and will generate an error.

We can solve this problem in a number of ways. The easiest is to use an instruction called LEA or Load Effective Address. This simply takes an address and loads it into an address register. Look at the following instruction:

```
LEA one(PC),A0
```

Its effect is to load the position of our data into A0, rather than the actual data itself. We can now use indirect addressing to load our data into the correct memory location with the instruction:

```
MOVE.W #1,(A0)
```

Therefore all you need to do in order to write 68000 programs capable of working within the Basic environment is to use this technique, avoiding the use of absolute addresses. Also remember to use relative BSR and branch instructions rather than the absolute JSR or JMP. You can now load your program anywhere you like, secure in the knowledge that it will execute correctly.

An additional problem when using assembly language from within Basic is that some assemblers always store the Tos initialisation information along with your program, whether it needs it or not.

If this happens, when you try to execute your routine the ST will try to interpret this data as 68000 instructions and will almost certainly crash. You need to add the length of this initialisation section (28 bytes) to the start of your program before you execute it:

```
CALL start+28
```

where *start* is the address of your program in memory.

To execute your program from ST Basic, there are three simple steps to follow:

- Allocate some space for your routine. Since ST Basic has no specific function for this, you should use an integer array to hold your code like:

```
10 DIM C%((P+28)/2)
```

where *P* is the length of your program in bytes – usually displayed after assembly – and *C%* is the name of the array. The division by two just compensates for the fact that each integer occupies two bytes.

- Load your routine into memory:

```
20 BLOAD "CODE.TOS",VARPTR(C%(0))
```

where CODE.TOS is the file containing your program and *VARPTR(C%(0))* is the address of the start of the array (other Basics use *ADR* rather than *VARPTR* for this purpose). BLOAD will load our program into memory starting at this point.

- Call your routine:

```
30 CALL VARPTR(C%(0))+28
```

executes the machine code, skipping over the Tos initialisation.

Although the details of this procedure may vary slightly from Basic to Basic, the principles remain the same.

Finally, a few words about what to do when the ST crashes. Even the most experienced 68000 programmer can make a mistake. This usually results in a number of pretty pictures of bombs being displayed on the screen. Your program then aborts and the ST makes a valiant, but often unsuccessful, attempt to return to the Gem desktop.

Although such events can be disconcerting, it is important to remember that no damage is done to your ST no matter how often it crashes.

By counting the number of bombs you can generally get a good idea about the cause of the error and how it might be corrected. Here is a list of the more common causes of such problems:

- *Two bombs*: A bus error, generated when you try to access a protected area of the ST's memory. It is typically caused by a missing # sign in your program. If for example, you write:

```
MOVE.W 300,D0
```

instead of:

```
MOVE.W #300,D0
```

the ST attempts to read from a protected memory location below 2048.

- *Three bombs*: Address error. You tried to perform a word sized operation on some data at an odd address. Check any extensions you are using. Also check any data placed in memory using a DC.B

operation. If you're not careful this can lead to an error. Take the following code:

```
MOVE.W ten,D0
RTS
string DC.B "Test",0
ten DC.W 10
```

The data at *string* is five bytes long and this causes the label *ten* to have an odd value. The solution is to use a pseudo-op called EVEN, to start your new data at *ten* at an even address:

```
string DC.B "TEST",0
EVEN
ten DC.W 10
```

- *Four bombs*: An illegal instruction, probably due to either a mistake when correcting the stack after a call to Tos or an attempt to execute some data defined using the DC command:

```
MOVE.W 1000,D0
DC.B "There is an RTS missing",0
```

- *Five bombs*: You tried to divide a number – using the DIV instruction – by a zero.

- *Six bombs*: CHK register against bounds instruction executed. Could be either a typo or a mistake when using Tos or Gem. If you are using this instruction intentionally, you forgot to load the start of your error handling routine into address \$18 – enter supervisor mode first.

- *Seven bombs*: TRAPV – trap on overflow condition executed. Same as CHK.

- *Eight bombs*: Privilege violation. You tried to execute a protected instruction while not in supervisor mode. Might be due to a mistake when using Tos. Could also occur when single stepping using a debugging package.

In certain circumstances it is also possible to generate practically whole screenfuls of bombs. This may be due to incorrect use of Tos or Gem, but is probably just a typo when using a trap. Only traps 1, 2, 13 and 14 are used by the ST's operating system. So typing something like:

```
TRAP #3
```

instead of:

```
TRAP #13
```

will generate an error and cause the ST to display no less than 35 bombs. The important thing to remember in this situation is not to panic. Most ST programs which crash like this can be corrected relatively quickly.

So that's it for this series. To my mind, the 68000 has to be one of the most powerful microprocessor systems available. Without a thorough knowledge of 68000 assembly language, 90 per cent of this power is unavailable for your use. I hope you've found the series useful. The rest is up to you.



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# Masterly software

**E**VERY computer owner has been asked that most pertinent of questions by the enquiring onlooker: "Yes, very good, but what do you actually use it for?" The answers can often baffle the non-computerate, as for many it's just to tinker with.

For the slightly more organised it's to write letters with or to keep the family address list on. And for the more financially adept it's to budget with and keep track of cash flow – or lack of it.

As far as serious applications go, word processors, spreadsheets and databases are by far the most popular productivity tools to run on the micro at home or work. Spreadsheets have far more use than just performing cheque book reconciliations – they are ideal for number juggling.

"What if..." situations can be accessed simply by editing in a few new numbers here and there. For instance, a local carpet fitter near me uses a spreadsheet on his micro to work out carpet and fitting costs for clients. He just enters room sizes, carpet costs per metre and so forth and slap, bang, wallop the answer is there instantly.

MasterPlan runs under Gem and will work on on a standard 520ST with single disc drive, but as spreadsheets by their very nature tend to gobble up memory at an alarming rate, a 1Mb machine is a near necessity for anybody planning to manipulate large amounts of data.

The MasterPlan display is nice, neat and un-cluttered. The standard menu bar contains six pull-down menus and below this is a control panel in which information is displayed or typed. Finally, the major portion of the screen shows a familiar spreadsheet consisting of cells referenced by numbered rows and lettered columns.

The sheet itself is a massive 8190 rows deep by IV columns across – in true numbers that's 8190\*256 or a shade over two million cells. Moving around is performed in a variety of ways – adjusting the slider bars, clicking the spreadsheet pointer in the relevant box, or pressing the cursor keys.

To go to a cell not currently displayed on screen the easiest way is to use the built-in function Goto. F5 can be pressed, the cell reference entered and you are then transported there. The current cell is highlighted by being shown in inverse video and its number and contents are always displayed in the control panel.

Entering information just requires the cell to be highlighted and the information typed in. On pressing Return the data is deposited there.

In general, spreadsheets can accept three different types of data, and Mas-

**Bruce Smith gives MasterPlan a thorough workout and finds it worth considering if you're looking for a flexible spreadsheet**

terPlan is no different. Numbers are the most obvious data types. The others are character strings, called labels, for marking rows and columns, and formulae to be applied to the current cells or perhaps a range of cells.

MasterPlan is intelligent enough to distinguish between them, unlike many other supposedly more sophisticated sheets I have encountered.

Another nice touch is that labels will flow across into adjacent cells if they are too long to fit into a single one. Again more often than not sheets truncate them into a single cell which can make annotating sheets a tedious task.

The Worksheet menu is important, as it

provides access to a number of commands that allow the sheet to be managed. These commands can be accessed through menus or more quickly at the keyboard by typing a forward slash followed by a command mnemonic.

For instance, the column width of all cells (not individual ones which is a shame) can be altered by typing /WC and then entering a number in the range 1 to 72. The full range of commands is shown in Table I.

Because the screen provides just a small movable window on a large spreadsheet, certain vital parts are not always in view. For example, a cheque book sheet might show each entry, but in a long list the total will be off screen.

What would be nice would be to always show the total at the base of the screen – and this can be done by creating a window. There can be two on screen arranged either horizontally or vertically and they can be created either by selecting the Windows option from the Worksheet menu or by entering /WW.

Moving between each window is

Command	Function
<b>Format (/WF)</b>	Selects the way in which values are printed and displayed on-screen. There are nine options – currency, date, fixed, general, percent, scientific, text, comma, plus or minus.
<b>Label-Prefix (/WL)</b>	Defines the manner in which labels are formatted. They may be aligned left, right or centred in their cells.
<b>Column-Width (/WC)</b>	The default column width is 9 characters. This command allows this to be varied from 1 to 72 characters.
<b>Titles (/WT)</b>	This allows rows, columns or both to be locked into position so that they do not scroll. This is useful to freeze headings with.
<b>Windows (/WW)</b>	Allows the screen to be split into two windows to display two sections of a spreadsheet either horizontally or vertically.
<b>Recalc (/WR)</b>	Forces the current spreadsheet to be recalculated should the automatic calculation mode be disabled to increase speed.
<b>Protect (/WP)</b>	This allows areas of the spreadsheet to be made safe by protecting them from accidental deletion.
<b>Status (/WS)</b>	Displays the current spreadsheet status information.

Table I: Worksheet commands



Desk File Edit Worksheet Range Graph										
		OK Cancel Calc Edit Graph			READY					
		A1: 'Bruce's Cheque Book								
CHEQUE										
	A	B	C	D	E	F	G	H		
1	Bruce's Cheque Book									
2										
3	Date	Number	Value	Payable to	For					
4										
5	April 1st	110123	88.11	Cinta	Meal					
6	April 3rd	110124	50	Cash						
7	April 5th	110125	34.95	St. Albans Sports	Running Shoes					
8	April 6th	110126	12.95	Dabs Press	Book					
9										
10										
11										
12										
13										
14										
15										

Figure I: Data entered into a single window

simple – just click on the one you wish to make active. The windows may also be synchronized so they scroll together either horizontally or vertically – important if the spreadsheet is wide or deep.

Functions are the means by which the

PMT	STD
IF	VAR
COS	HLOOKUP
RAND	VLOOPUP
SQRT	YEAR

Table II: MasterPlan Functions

information held within a spreadsheet is manipulated. They are entered into cells and may take numbers or cell contents, referenced by their grid position as a parameter in their calculation.

For instance, to total the numbers held

in the column of cells from A1 to A5 and store the result in cell A6, the following would need to be entered into cell A6: SUM(A1..A5). The full list of functions is shown in Table II.

MasterPlan, like so many spreadsheets these days features a graphics facility which can be used to display data extracted from the spreadsheet in either bar, stacked bar, line or pie format.

Select the Graph option from the menu bar, followed by the graph type. Enter up to six data ranges of information and finally select View from the Graph menu.

The final area for discussion is the file and print handling commands and these are most extensive, though there does seem to be one omission – the ability to link a number of spreadsheets.

This allows data from a wide range of sheets to be linked to a master. As the

Key	Function
F1	Help: Reads help text files from disc, there are eleven topics to choose from.
F2	Edit: Copies the current cell contents to the control panel ready for editing.
F3	Name: Displays a list of the current named cell ranges.
F4	Absolute: Ensures that cell references in a formula are relative, absolute or mixed.
F5	Goto: Prompts for a cell reference and moves directly to it.
F6	Window: Allows windows to be moved between once created.
F9	Recalculate: Forces the entire spreadsheet to be re-calculated.
F10	Graph: Displays the most recently drawn graph, if any.

Table III: Function key actions

sheets are altered the master is automatically updated accordingly with the data tied to it. A full range of print options is also available, even to the inclusion of headers and footers.

In addition to the normal range of loads and saves, marked sections may be saved for reloading into another sheet. Data may be imported from other sources such as Lotus 1-2-3 and VIP Professional, and spreadsheets may also be combined.

One quite disturbing facet is that there is no safety net provided by the software, so if you accidentally select New from the file menu it throws out any current sheet without providing an "Are you sure?" prompt.

The 148 page manual is well written and contains all the information you are

Turn to Page 88 ►

Desk File Edit Worksheet Range Graph										
OK Cancel Calc Edit Graph					READY					
C8192:										
CHEQUE2										
	A	B	C	D	E	F	G	H		
1	Bruce's Cheque Book									
2										
3	Date	Number		Payable to		For				
4										
5	April 1st	110123	88.11	Cinta		Meal				
6	April 3rd	110124	50	Cash						
7	April 5th	110125	34.95	St. Albans Sports		Running Shoes				
0	CHEQUE2 2								M	
	A	B	C	D	E	F	G	H	↕	
8190										
8191										
8192	Total Spent:								↕	
↕										↕

Figure II: A second window has been defined to hold the total at the base of the screen

Desk File Edit Worksheet Range Graph									
		OK		Cancel		Calc		Edit   Graph	
		C5: 88.11							
READY									
CHEQUES									
A B C D E F G H									
1 Bruce's Cheque Book									
2									
3 Date Number Payable to For									
4									
5 April 1st 110123 88.11 Cinta Meal									
6 April 3rd 110124 50 Cash									
7 April 5th 110125 34.95 St. Albans Sports Running Shoes									
CHEQUE3 2									
A B C D E F G H									
8188									
8189									
8190 Total Spent: 186.01									
8191									
8192 Total Spent: 88.11									

Figure III: Here the grid has been turned off and the sum total added into the cell in window two



## ◀ From Page 87

likely to need. Locating it is another matter as there is no index – however, a good contents list is included.

There is also online help, via F1 as a number of help files are included on the MasterPlan disc. These can be accessed at any point and information on specific subjects sought.

One gripe I had about the product is that the disc doesn't contain any example sheets to play around with, or even any sample templates that could be put to good use immediately – like a cheque book reconciliation program.

As already mentioned, there are no examples on the disc and none in the manual. The offshoot of this is that those new to spreadsheets will find MasterPlan

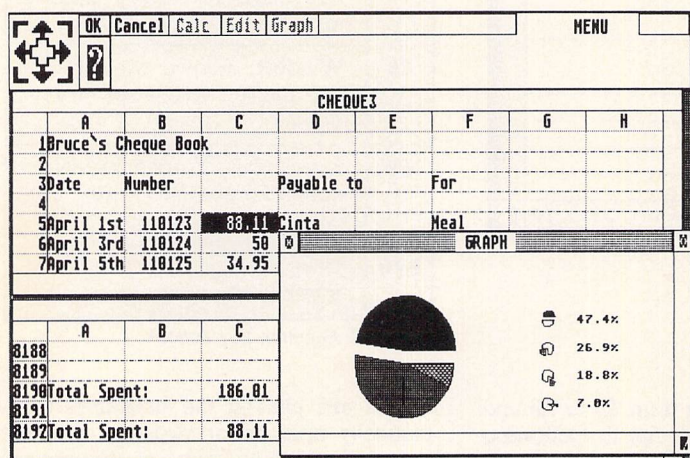


Figure IV: A pie graph of the cheques issued so far

Operator	Function
^	Exponential
-	Negative
+	Positive
*	Multiplication
/	Division
-	subtraction
+	addition
=	Equals
<>	Not equal
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to
#NOT#	Logical Not
#AND#	Logical And
#OR#	Logical Or

Table IV: MasterPlan operators

quite difficult to get to grips with. For those with spreadsheet experience it is a good product and worth considering.

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


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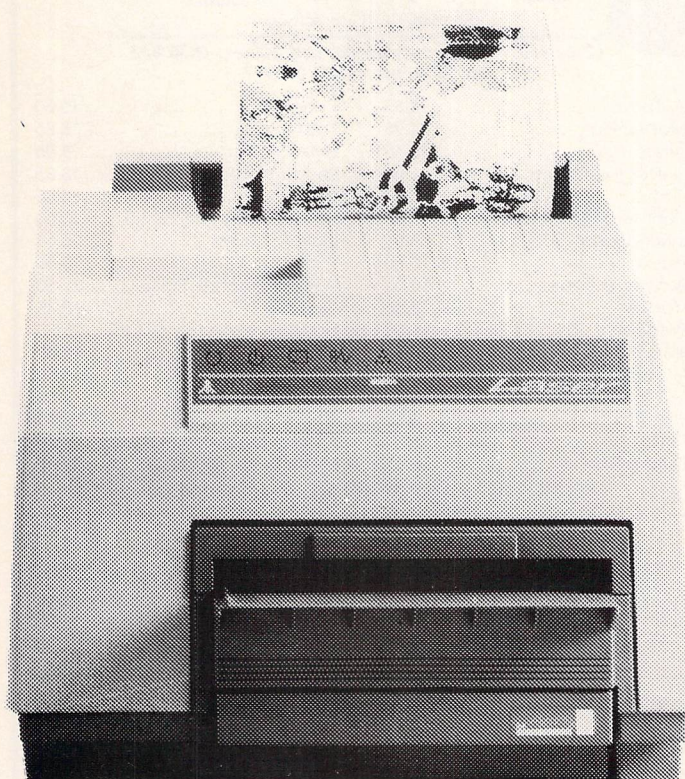
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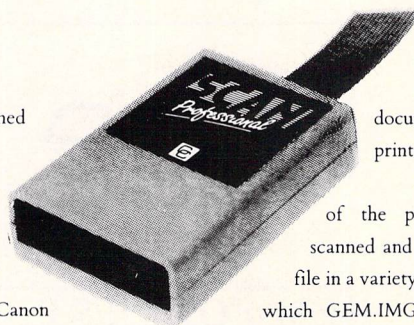
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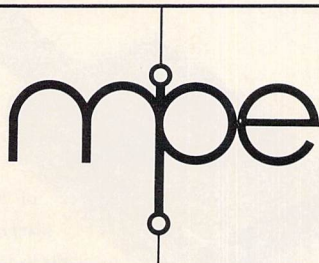
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# SCRAP BOOK

**P**RIME number generators are quite common and everyone has either seen one or perhaps even written one themselves at some time or other. We published a program to test whether a number is prime or not in the June 1987 issue of *Atari ST User*.

For those who have never met these mathematical oddities, they are simply numbers that cannot be divided by any other number without leaving a remainder. So 13 is a prime number as nothing will divide into it, however, 14 isn't as both 2 and 7 will divide into it exactly.

A prime number generator is a program which will work out these special numbers, producing a list like 3, 5, 7, 11, 13, 17, 19, 23. As always, there's more than one way to skin a cat, but we thought we had seen every possible method until, that is, James Smith from Birmingham sent us his version.

We wouldn't normally give a prime number generator a second glance, however James' program is so incredibly fast we thought you'd like to see it too. It will calculate all the prime numbers up to 1000 so quickly it can't be timed.

All the numbers up to 10,000 takes just 3 hundredths of a second, and 50,000 takes a mere 19 hundredths of a second. For non-believers, it will also print them out so you can check them.

Although it is written entirely in 68000 machine code, that isn't the main reason for its amazing speed – it's the clever algorithm used. Although the full details aren't quite clear, basically it works like this:

Dimension a large array to store the prime numbers. Forget all even numbers, as they can be divided by two. Start with

**SCRAPBOOK is a special feature consisting of short, simple programs sent in by our readers. It's a place where we can publish all of the interesting little routines that don't end up in our regular features but are too good for us not to share with other readers.**

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***Scrapbook, Atari ST User, Europa House,  
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the first prime number – three – and knock out all multiples – 6, 9, 12, 15 and so on – as they can all be divided by three.

Move on to the next number – four is even so skip it, the next one's five. Knock out all the multiples – 10, 15, 20, 25 and so on. Move on to the next number – six is even so skip it. Knock out all multiples of seven. Move on to the next – eight is even so skip it, nine has been knocked out, so

has ten – knock out all multiples of 11.

And so it goes on. Eventually, all the non-prime numbers will have been either knocked out or skipped, leaving just the primes. These can then be printed out.

The listing was written using HiSoft's Devpac assembly language development package. However, it shouldn't be too difficult to convert to any other assembler if you haven't got Devpac.

```
*****
* Ultra-Fast Prime Number Generator! *
* 68000 version by James Smith *
* (c) Atari ST User *
*****

***** Print character *****
printc MACRO
    MOVE \1,-(A7)
    MOVE #2,-(A7)
    TRAP #1
    ADDQ.L #4,A7
ENDM
```

```
* Execute routine in supervisor mode *
super MACRO
    PEA \1(PC)
    MOVE #38,-(A7)
    TRAP #14
    ADDQ.L #2,A7
ENDM

***** Print a string *****
sprint MACRO
    PEA \1(PC)
    MOVE #9,-(A7)
```

```
TRAP #1
ADDQ.L #6,A7
ENDM
```

```
***** Start of program *****
LEA variables(PC),A6 A6->variables
sprint prompt1 Print prompt
JSR input D4=range
MOVE.L D4,0(A6) Store
SUBQ.L #1,D4
LSR.L #1,D4 D4=(D4-1)DIV 2
```

**Turn to Page 93 ►**



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## ◀ From Page 91

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super zclock              Zero clock
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super gtime              Time in 100ths sec
JSR ptime                Print time
sprint prompt2           Print prompt
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sprint prompt2
JSR waitkey
CLR -(A7)                Return to desktop
TRAP #1                  P_TERM_OLD

```

```

*****
* Print out prime numbers
*****

```

```

prprime
printc #27
printc #'v'
MOVE.L #1,D7
LEA p(PC),A5              A5->array
priloop
TST.B 0(A5,D7)           IF >0 GOTO prinext
BNE prinext
MOVE.L D7,D0
ADD.L D7,D0
ADDQ.L #1,D0
JSR printn
printc #32
printc #32
prinext
ADDQ.L #1,D7
CMP.L 10(A6),D7
BLE priloop
RTS

```

```

*****
* Calculate primes
*****

```

```

primes
MOVE.L #1,D7
MOVE.L 10(A6),D3
LEA p(PC),A5              A5->array
prloop
TST.B 0(A5,D7)           IF >0 GOTO prnext
BNE.S prnext
MOVE.L D7,D5
ADD D7,D5
ADDQ #1,D5
MOVE.L D7,D4
MULU D5,D4
ADD D7,D4
prloop1
TAS 0(A5,D4)
ADD D5,D4
CMP D3,D4
BLE.S prloop1
prnext
ADDQ #1,D7
CMP D7,D6
BGE.S prloop
RTS

```

```

*****

```

```

getq
MOVE.L 0(A6),D7
MOVE.L D7,D6
LSR.L #2,D6               D6=D7 DIV 4
BTST #12,D7              very big number?
BEQ.S notbig
LSR.L #2,D6               D6=D6 DIV 4

```

```

notbig
MOVE.L D6,D5              D5=D6
gloop
LSR.L #1,D5              D5=D5 DIV 2
MOVE.L D6,D0
MULU D6,D0                D6*D6>D7?
CMP.L D7,D0
BEQ.S gdone
BGT.S toobig
ADD.L D5,D6               D6=D6+D5
BRA.S gun1
toobig
SUB.L D5,D6               D6=D6-D5
gun1
CMPI.L #1,D5              UNTIL D5=1
BGT.S gloop
MOVE.L D6,D0
MULU D6,D0
CMP.L D7,D0
BGT.S tbig
gloop1
ADDQ.L #1,D6
MOVE.L D6,D0
MULU D6,D0
CMP.L D0,D7
BGE.S gloop1
SUBQ.L #1,D6
BRA.S gdone
tbig
SUBQ.L #1,D6
MOVE.L D6,D0
MULU D6,D0
CMP.L D0,D7
BLE.S tbig
gdone
SUBQ.L #1,D6
LSR.L #1,D6
RTS
D6=(SQR D7-1)DIV 2

```

```

*****
* Print time in D0.L
*****

```

```

ptime
MOVE.L #100,D1
DIVU D1,D0                D0=secs/100ths
MOVE.L D0,D5
ANDI.L $FFFF,D0
JSR printn                Print seconds
printc #'.'              Print decimal point
CLR D5
SWAP D5
CMPI #9,D5                Double figures?
BGT pok
printc #0'               Print 1 leading zero
pok
MOVE.L D5,D0
JSR printn                Prints 100ths
sprint secs2
RTS

```

```

*****

```

```

* Wait for a keypress
*****

```

```

waitkey
MOVE #8,-(A7)
TRAP #1                   C_NECIN
ADDQ.L #2,A7
RTS

```

```

*****

```

```

* Print decimal number in D0.L
*****

```

```

printn
CLR 4(A6)
MOVE.L #10000,D1

```

```

JSR digit
MOVE.L #1000,D1
JSR digit
MOVE.L #100,D1
JSR digit
MOVE.L #10,D1
JSR digit
BRA lastdi                Last digit
digit
DIVU D1,D0                D0=remainder/quotient
BNE dinz
TST 4(A6)                 Leading zero?
BEQ diskp
dinz
MOVE.L D0,D4              Save result
lastdi
ADDI #'0',D0
printc D0
TAS 4(A6)                 Can print zeros now
MOVE.L D4,D0              Put remainder in D0
CLR D0
diskp
SWAP D0
RTS

```

```

*****

```

```

* Supervisor mode clock routines
*****

```

```

gtime

```

```

MOVE.L $4BA,D0            200Hz tick count
LSR.L #1,D0                100ths second
RTS

```

```

zclock
CLR.L $4BA                Zero 200Hz clock
RTS

```

```

*****

```

```

* Input number
*****

```

```

input

```

```

CLR.L D4                  D4=result=0
inloop

```

```

MOVE #1,-(A7)             Get digit
TRAP #1                   C_CONIN

```

```

ADDQ.L #2,A7
CMPI #'0',D0              End if not digit
BLT endin
CMPI #'9',D0

```

```

BGT endin
MOVE.L #10,D1             result=result*10
MULU D1,D4

```

```

SUBI #'0',D0              Add digit to result
ADD D0,D4
BRA inloop

```

```

endin
RTS

```

```

variables

```

```

DC.L 0
DC.W 0
DC.L 0
DC.L 0

```

```

prompt1
DC.B 13,10
DC.B "Input largest number:",0

```

```

prompt2
DC.B 13,10,10,"Press a key:",0

```

```

secs1
DC.B 13,10,10,"Time taken =",0

```

```

secs2
DC.B "seconds",0
EVEN

```

```

p DS.B 1024*50
**** END ****

```



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# Draw your own conclusion

**I**S it possible to produce another graphics package which will rival established programs such as NeoChrome, Degas or Art Studio? Several software companies seem to think so, and Grafix comes from a new one, ShackSoft, an offshoot of the established dealer Bath Computer Shack.

It's a high resolution bit-mapped program, provided on a single disc. The first thing you'll realise on booting the software is that it doesn't use colour. Like the monochrome mode of Degas, Grafix lets you concentrate more on creating and manipulating shapes, rather than in defining complicated colour palettes and dealing in subtleties of shade and graduation.

Grafix is written entirely in Computer Concepts' Fast Basic, which may be one reason why the program makes very little use of the Gem operating system. In any case, there is an argument for having all the available commands of a graphics package presented on the main work screen, rather than on drop-down menus.

Surprisingly though, many of the complex functions of Grafix such as Rotate and Mirror are remarkably fast. Grafix runs on any ST, including those with blitter chips, but it consumes all of the memory of a 520, so you cannot have desk accessories installed.

It's fully mouse-driven and critical operations are handled using alert boxes. The main work screen has 10 permanent menus which surround the working area. Each is titled at the top, and functions are selected by clicking on the appropriate box with the left mouse button.

Once in a function, you will generally find that the left button causes things to happen and the right button cancels the effect or returns to the menu screen.

Apart from the mouse, you can also use the Shift and arrow keys to control the cursor for precise positioning, and the Pixel function to show an eight-times expanded image in the right hand side of the screen.

I'll go through the 39 major drawing functions to give you some idea of the capabilities of Grafix.

Look removes the cursor from the screen for viewing your finished work of art, or printing out on to any dot-matrix printer.

Clear erases the entire screen using

**Budget art packages are few and far between. Chris Jenkins assesses one from Shacksoft**

the current fill pattern, selected from the standard ST patterns shown in the menu on the right-hand side of the screen. The Pen option draws in either black or white and the thickness of the line is set using the Line Txt option with seven thicknesses available.

The cursor disappears while you are drawing, which makes it easier to see what you are doing, although sometimes difficult to see where you are. The Graf-mode menu determines the manner in which the Pen function, and most of the other drawing options, alter the screen.

The normal mode is Replace, which draws over the existing graphics. You can, however, choose options such as Xor, which reverses the existing colour as you draw over it.

Plot sets a single dot on the screen, from a single pixel up to a dot the width of the largest setting on the Line Txt option,

filled in the current pattern. Pity there's no coordinate display to tell you your current screen position.

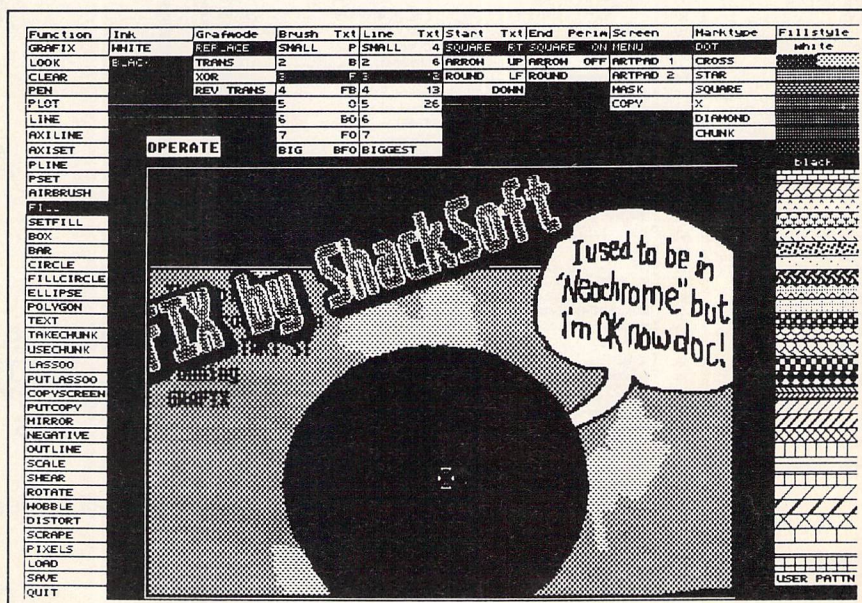
Line draws straight lines, rubber-banding until you fix the position with a click on the left mouse button. Thickness, again, is set with the Line Txt function. The Axi-set option displays a circle with three intersecting lines which can be swivelled to give any required set of angles.

Lines then drawn using the Axiline option are forced to fall along one of these axes. It's a useful way of drawing, say, isometric polyhedrons, without the need for hidden line removal.

The Pline function is similar, but this allows the drawing of perspective lines, forced according to the vanishing points set using Pset. The manual gives several useful points about the principles of perspective, which you will need to understand if you want to create realistic solid shapes or, for instance, railway lines vanishing into the distance.

Airbrush sprays single marks, or chunks, on to the screen, building them up slowly in a random way. Chunks are defined using the Takechunk option: You

Turn to Page 96 ►



The menu screen



## ◀ From Page 97

draw a rectangle around a section of the screen, and after confirming that you want to keep it, you can use it as a fill, airbrush or pen shape.

There's also a function called Lasso which allows you to define irregularly shaped chunks. Fill is a flood fill starting from the cursor position and uses the current fill pattern. You can't stop it if it starts to leak through the borders destroying your masterpiece, though you can undo it after the process has finished.

You can set your own fill pattern using the Setfill option, which picks up a 16 x 16 pixel grid centred on the cursor position and displays it in a small window at the top left hand side of the screen.

Box draws an open box, Bar draws a solid bar, Circle draws an outline circle, while Fillcircle draws a filled circle. Ellipse and Polygon are similarly straightforward. You can even define complex polygons like figure 8s, and Grafix will correctly decide what is inside and what is outside the filled polygon.

Text functions are fairly powerful, with five font sizes, horizontally, vertically or

upside down, in plain, bold, feint and outline. You can also expand any text you place on the screen using Scale or Distort, which remap the contents of a defined rectangle on to another rectangle.

You can use Shear to skew an image horizontally or vertically, producing an effect which would be impossible to reproduce in any other way. You can also Rotate the image around a central point. The manual suggests that the blurring effect of Rotate can be used to make synthetic-looking pictures look more realistic; I remain unconvinced.

Goodness knows why you would want to use the Wobble feature – it is supposed to "simulate the effect of a faulty television set".

Among the most useful features of Grafix are the multiple workscreens. The main menu has a work area of 344 x 196 pixels; there are also two 640 x 400 pixel Artpad screens, the Mask screen which is used to edit lassoed images, the Copy screen which stores chunk image data, and two invisible screen buffers which are used in Help and Copy operations.

You can draw on one workscreen and

use Scrape to reveal it through the other piece by piece. You can also use one screen as a scratchpad, define chunks on it and then use them on another screen. Grafix unfortunately, has its own screen file format, but a conversion program on the disc allows you to change Degas high resolution or Neochrome colour files.

Apart from that little inconvenience, the only drawback is a lack of error trapping which allows you to, for instance, crash the program if you try to load a text file into a screen area. I also got the odd "Program stopped due to system error no ..." message, but couldn't work out whether this was a program bug, a Fast Basic problem or a system error.

Grafix includes most of the functions you would require from a drawing package, and at a price that provides a viable alternative to Degas Elite.

Product: Grafix

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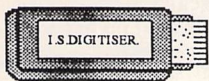
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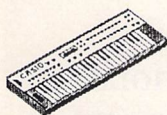
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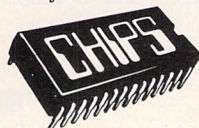
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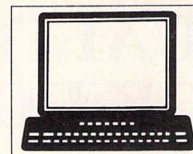
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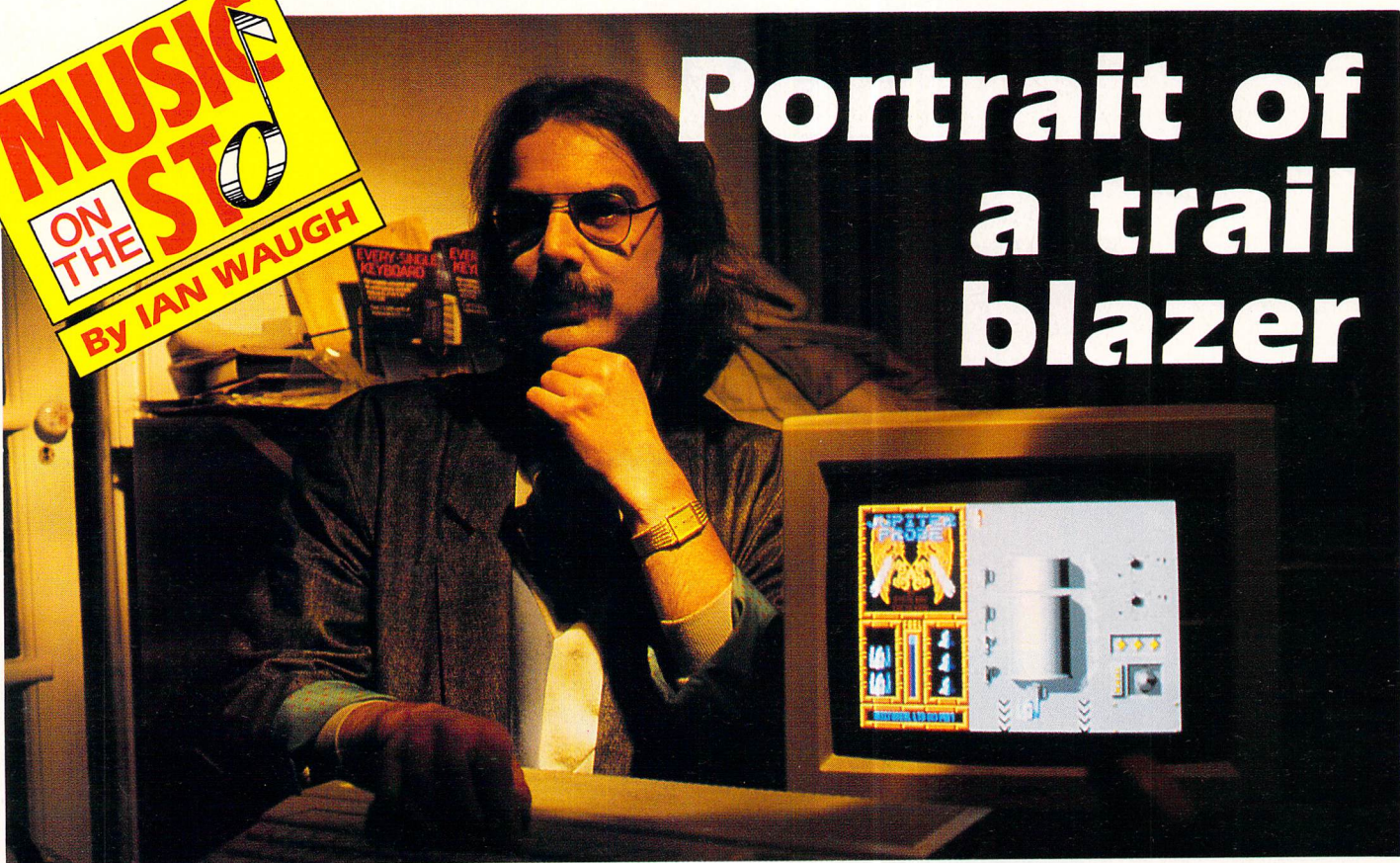
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# Portrait of a trail blazer



**T**HERE are pioneers and pioneers. Some climb mountains, some forge chasms, while others develop and practice their own particular skill, honing it to perfection.

Just such a pioneer is Rob Hubbard, whose work in the field of computer music must surely rank him as the most popular and well-known computer musician in the industry today.

By the time you read this Rob will be in California – somewhere between San Francisco and San Jose – working for Electronic Arts. I asked him why, apart from the sea, sand and sun, he was going to America.

*"When you're involved in a certain type of work, it suddenly dawns on you that there's nowhere else to go. You have to try to think of something else. Out there they are completely committed to CDI – Compact Disc Interactive."*

*"Has that taken off over there?"*

*"They're actually sticking their neck out and going for it. It's really new technology and it hasn't hit first generation yet. There are areas in the music field where I think I can make some positive contributions."*

*"In the short term I'll be working on the same sort of projects I've been working on over here. But the technical resources over there are much better. I'll be working in the Artists' Laboratory. They call programmers artists which is pretty nice."*

*"Everything's based on what they call the artist's work station – an IBM-based system. Instead of using my dinosaur*

**Rob Hubbard is one of the best known micro musicians. Here's how he first got involved**

*sampler on something like the 64, I can sample on the Amiga and put it into the IBM, manipulate it and put it back on to the 64 or an ST. Once you have a sample file on the IBM you have much more flexibility with it."*

*"You're talking about processing the sound. Why not just record real or synthesised instruments?"*

*"One of the things I'm researching at the moment is various ways of synthesising sounds purely digitally rather than using samples. Even on the ST, samples take up a lot of memory and for certain applications you need something which sounds good, but in a small amount of memory."*

*"And it's not just the amount of memory a sample uses. More importantly, you could be using 50 per cent of the processor's time to play it back."*

*"It'll be maybe two to five years before we can get pure digital sounds on an Amiga or ST. But even now I reckon I can improve the quality of the samples I've been using by about 20 per cent."*

*"At the moment people have just been doing the really dumb thing like sampling 10 seconds from a record and looping it. It sounds impressive but it's not very con-*

*structive is it? I'd like to get some samples together on the ST."*

*"How did you first get involved with computers?"*

*"When the Commodore 64 dropped from £300 to £200 I just went and bought one to see what it was all about. Everyone was jumping up and down saying you should buy a computer. That was in November 1983."*

*"How did you start writing computer music?"*

*"At the time they were saying educational software was really starting to take off. I wrote some, but it didn't due to the fact that schools couldn't afford computers. Having given that up as a bad job I started work writing games for a company, but it went bust."*

*"After that I came up with the brilliant idea of just trying to do music. There were people just starting to specialise in graphics. Until then you used to get one guy doing everything themselves."*

*"It took me a long time to convince anyone that it was a good idea – about seven months. Eventually I got some work and it just kind of took off and went berserk. The first music I did on the 64 was for a program called Confusion for Incentive Software although I didn't actually write the tune."*

*"Can you remember everything you've written?"*

*"No. I've done about 70 projects. Some of those are on all different formats. It's a lot of work. Also at that time the money started going up. It was a bit*



embarrassing."

"There's a lot of money in software?"

"Yes, but some people have difficulties getting money out of software companies. You find out that the guys who own the company have just bought another Porsche or Ferrari."

"What do you think of the sound chip in the ST? Did Atari make a mistake?"

"Yes! It should have put the FM sound chip in straight away. It was talking about it in the early days, but left it out to cut costs."

"What music have you written for the ST?"

"Goldrunner, Jupiter Probe, Thrust, Warhawk and Thundercats. If I had to pick a favourite it would probably be Jupiter Probe."

"How did you start writing for the ST?"

"A guy in Yorkshire wanted me to do something on the ST. I said I haven't got a clue about the ST, I don't have an ST, I haven't any routines. He said come down and we'll put something together. That was Steve Bak. He knew the ST inside out."

"We got it together in two days. I only had two days to do it because I had to be in London the day after. Steve basically gave me a crash course in 68000 and together we got the thing up and running. That was Goldrunner."

"How many different routines do you actually have?"

"I have fairly standard routines like vibrato and there are the multiplex routines which give the impression of a chord played with only one voice. I like to try to think of new things and ideas."

"Even after 70 projects?"

"Well, you reach a point where there's not that much more you can think of to do."

"What do you write in?"

"I write pure assembler on the ST."

"How do the programmers interact with your music?"

"On computers such as the ST or the Amiga you generally write either a linkable file or a fully position-independent file. It's got to run anywhere in memory and you basically make it as simple as possible for the programmer."

## Composing

"How long does it take to write a piece of music?"

(Rob turns to the piano and knocks out a tune.)

"As quick as that?"

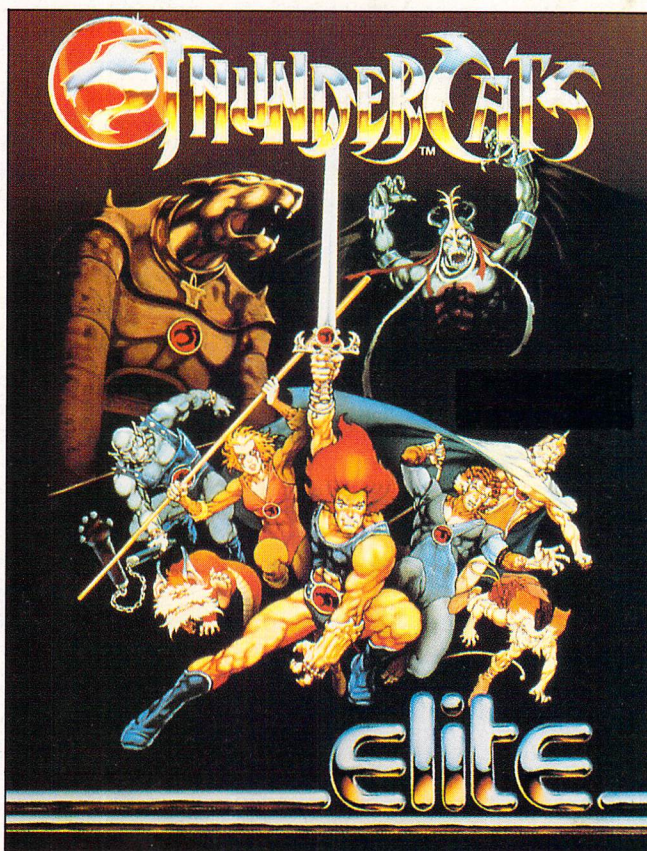
"No, but when I'm doing a lot of work I

tend to go through different processes. Sometimes I'll just sit at a keyboard and keep at it until I come up with something. Other times I'll plug into a cassette and play for three hours. Then I'll play it back and see what there is."

"Do you start with a tune, a bass line, a chord sequence?"

"You haven't got the luxury of thinking in chords. It's no good hitting a minor ninth (plays it on piano) and thinking that'll sound good on strings cause you just can't do it. You think in a very linear, melodic way, answering phrases, counter melody lines and so on."

"In the early days I was bursting with ideas. I had ideas coming out my whatsits but gradually doing all this work you tend to lose the staying power that you had."



Just one of the ST products backed by Rob Hubbard's micro music

"The fact is if you have outstanding projects you've got to come up with an idea. The pressure's on you. No matter how uninspired you feel you've still got to try to do it. I've had a couple of really bad days. I've literally spent the whole day trying to come up with something."

"Even though I've spent a lot of years playing, I've always liked writing better than playing. I'd rather be a composer, writing parts out and giving them to the guys to play. I'd like to write for films but it's too hard to get into."

"I suppose people would say it's difficult to get into writing music for computers. You've set the standard for that."

"Well, I suppose I started the whole

thing off. I enjoy writing stuff."

"Have you any favourite film composers?"

"John Williams. I think he's absolutely superb. He's brilliant. His orchestrations, his development of themes is really good. He comes up with such strong melodies. Carl Davis is superb, too."

"Do you think you're influenced by John Williams?"

"No. It's too hard to capture that sort of thing."

## Midi

"Have you experimented with Midi on the ST?"

"I had a Steinberg Pro-24, but I gave it away after I sold all my gear. I never used it much - I never had the time."

"Obviously the ST is the computer for music applications because of the Midi sockets. There is so much good music software although the price of it is ridiculous."

"Considering the time programs take to develop and the fact that they're not going to sell an awful lot do you not think the prices are justified?"

"But if software was reduced in price how many people would buy it rather than look for a hacked version? The prices are ludicrous."

"Some games programs play the tunes through the ST's Midi sockets. Will we see any Rob Hubbard Midi Music?"

"I don't know. It's quite easy to write a program to sling them out the Midi. It's an area which might open up. I think it's a bit gimmicky and it imposes so many restrictions on the way you have to compose."

"What do you think of the Midi concept?"

"I think it's done well. People thought it wouldn't last very long as it's a serial interface."

"What do you think of current chart material?"

"It's so easy for people who aren't particularly brilliant musicians to get hold of a drum machine and knock out a tune."

"Do you blame Midi for this?"

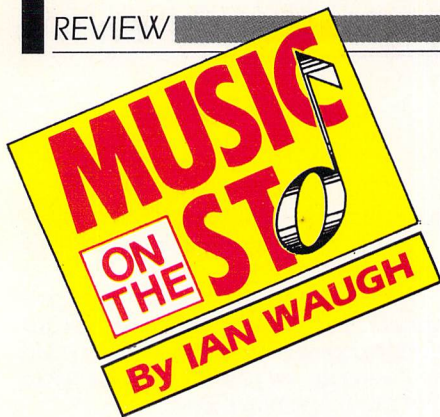
"No, not really, it's just an abuse of the whole new technology."

"Any final thoughts?"

"I think there's still a big future in the industry. A lot of people think it's winding down. In a lot of ways we're just waiting for the hardware to catch up."

It's obvious that Rob Hubbard knows which direction he wants computer music to go and he's out there pioneering again making sure it doesn't go astray.





**If interactive pattern based processing and composition appeals Intelligent Music's M could be the answer**

**W**HILE a good computer-based sequencer is undoubtedly a musician's best friend, have you ever wondered if Midi could not be put to a more, say, creative use?

American software house Intelligent Music did. It came up with the bright idea of interactive and intelligent software and M is the first such program to appear for the Atari ST.

M is subtitled "The Interactive Composing and Performing System". The simplest description I can think of for it is a pattern processor. The processing involves such things as selecting notes from a pattern in a controlled random fashion, applying time offsets to a pattern and setting up cycles of note durations

# Mmm ... nice!

and accents.

M has only one screen. It is divided into six sections or windows and each one can process a pattern in a different way. The Pattern window is in the top left corner of the screen. Four patterns can be active at any one time and you can enter five different types.

Step-time record – shown in icon form as a pair of feet – will record a series of notes and chords from a Midi keyboard. They don't have a duration or volume level – these are set in other windows.

A pitch distribution pattern is a collection of individual pitches, again without any duration and so on. If a note is entered into the pattern more than once it has more chance of being played when random note selection is used. This is very useful as it lets you bias a pattern towards a certain pitch or group of pitches.

There is a real-time record option which does record durations, and a drum machine record option in which pitches are entered within a repeating loop sequence. Finally, you can import notes from a Midi file rather than from a keyboard.

Although only four patterns can be active at once, you can record up to six sets of four patterns. These set-ups are selected by clicking on the pattern group bar labelled A to F below the Pattern window. On the right of the screen is the

cyclic editor, which is used to set cycles of durations, articulation – legato verses staccato – and accents. The cycles can be up to 16 steps long and, as with the patterns, you can program up to six set-ups of each kind of cycle.

Before we get lost in the details of the M – there's lots more to come – let's see how the cyclic editor works in practice. If you record the eight notes of a scale in a step-time pattern and set a duration cycle eight steps long with each step the same length, you'd get a regular, even scale.

If you halved the duration of every other step in the cycle, the scale would play with a dotted-quaver rhythm. Now, if you reduce the length of the cycle to only seven steps, each of the eight notes would be subjected to alternate long and short durations. Get the idea?

When you consider that you can perform similar cyclic operations on the notes' volume – accents – and on time – articulation – you can see how complex and interacting lines of music can be constructed.

Let's dip down to the note manipulation window. The note order section lets you change the probability that the notes will be played back in the same order they were recorded. Below that the direction box is used to vary the probability that the note sequence will be played backwards.

The note box alters the density of the

## New ST software floods in

**A roundup of the latest ST music scene and a preview of some new products**

**B**Y the time you read this the biggest Music Fair in the world will have taken place in Germany. The Frankfurt Music Messe has gone from strength to strength – and size to size – and this year it will see an expected 50,000 visitors tramping across 72,000 square metres of floor space. That's bigger than your average Music Fair.

The ST is unquestionably the most important music computer, and there will be tons of software for it on show – everything from sequencers to voice editors and ST-based samplers.

Intelligent Music is rushing to complete Upbeat for the show. This is a kind of M for drum machines. It was originally written for the Apple Macintosh and was snapped up by lots of musicians. We'll be

taking a closer look at it as soon as it is released. Intelligent Music is planning at least two more interactive programs says distributor MCM, but that's as much as anyone knows – or is telling.

Also due from Intelligent Music is the Axxess Midi Mapper, a hardware device which can make virtually any Midi signal activate any number of Midi processes.

For example, pressing only one button on your synthesiser could alter every patch on all connected instruments, set volume levels, tuning and transmit any other Midi information.

A single note can be transformed into any Midi action, including the playing of a chord.

Banks of set-ups can be programmed so the system can be used both live and in the studio.

The only controls it has are two buttons and an LED screen. It is expected to cost around £595.

Dr. T Software, also distributed by MCM, is developing three interactive programs of its own. Fingers I will use the ST's internal sound chip, while Fingers II

will work over Midi. Both will feature intelligent music routines.

The only thing I know about the third program is the name, Tunesmith. Does that give away any clues? All should be available in due course for less than £95.

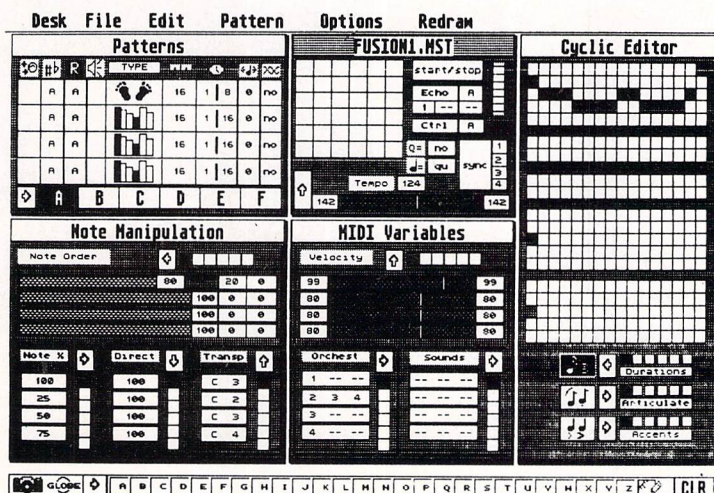
Available now is Dr. T's KCS level II MPE with PVG. Translated, that reads Keyboard Controlled Sequencer Multiple Programming Environment with Programmable Variations Generator.

Once you learn how to pronounce it, you have to learn how to use it. It's a very complex, sophisticated piece of software which lets you run several programs interactively on your ST at the same time. For instance, you could load your ST with a sequencer – Dr. T's, of course – and a voice editor, run the sequencer and edit a voice in real-time as the sequence plays.

The PVG section lets you generate variations from any recorded musical part. It can produce a single variation on a part or a series of variations that evolve over time.

With all these products available, per-





M's main editing screen split into six windows each of which can process a pattern in a different way

notes, that is, the probability that a note will actually sound. For instance, a value of 50 per cent will give each note a 50/50 chance of playing. There is also a transpose option and, as with the other windows, six different set-ups can be programmed for each section.

The midi variables window lets you program a range of volumes – velocity – for each pattern and below that in the orchestra section you can enter up to three Midi channels to which a pattern will be sent. The sounds box lets you select three sound patches for each pattern.

The global control window – middle top – controls start, stop, tempo and sync operations. The final section is the snapshot window, which runs along the

bottom of the screen. Here you can store a picture of all the screen controls at any time. During a performance, clicking on a snapshot instantly recalls the settings.

Each group of six set-ups has a box containing an arrow near it. Clicking on this lets you conduct your way through the six set-ups in the conductor window – the grid in the global control window. All sections, therefore, can react together. Although it's a nice idea, I found the snapshots far more useful.

Finally, there is a movie icon – it looks like a strip of film – in the global control window. Clicking on it will record a performance as you play it and save it to disc as a Midi file. It can then be loaded into a normal sequencer.

I did have a few niggles: You can't

specify a limit on the number of set-ups you conduct – you may not have programmed all six – and I would like to have been able to copy the contents of one cyclic editor window to another and one set-up to another.

The screen takes a thumb-twiddling five seconds to update and I wish some sample pieces had been included because it's nice to see what a company can do with its own program.

M lends itself to sequence-based music à la Tangerine Dream, ambient music and just plain, or not so plain, avant garde, although distributor MCM says some users have extracted pop-type riffs from it.

Although the disc is well protected, it contains a demo program which you can freely copy and give to friends. It does everything the full version does except save files, and it only runs for 10 to 20 minutes. A nice idea.

Shortly after completing this review, version 1.1 was released, although it is still in transit from the USA to the UK. Distributor MCM says all the bugs have been fixed – the review copy crashed several times – and one or two things have been tidied up.

If the idea of interactive pattern-based processing and composition appeals to you you'll certainly like M. It's only the first of what promises to be a whole new generation of Midi programs.

Product: Intelligent Music's M

Price: £135

Supplier: MCM, 9 Hatton Street, London, NW8

Tel: 01-258 3454

haps a few words about the distributor is in order. MCM, or MCMXCIX – Roman numerals for 1999 – to give it its full title, is a recently formed company.

It has been appointed UK distributors for several hardware manufacturers and software houses including Dr. T, Intelligent Music, Passport Designs, Opcode, Mark of the Unicorn, Digidesign and Southworth. It currently has over 100 software titles on its list and no doubt we'll be hearing a lot more in the future.

New from Sound Technology is C-Lab's scorewriter-cum-sequencer program, Notator. A demonstration version is going the rounds now and it's due for release at Frankfurt. C-Lab's sequencer, Creator – reviewed in the November 1987 issue of *Atari ST User* and now into version 1.3 – is built in and at the all-in price of £485 it seems, as far as Midi software goes, very reasonably priced.

Sonus is well-known in America and set up offices in the UK late last year to handle UK and European distribution. It has just dropped the price of its professional level ST sequencing program,

MasterPiece, to £150. Its latest release is SST or Super Sequencer. Although it's fair to say SST is a cut down version of MasterPiece with only 24 tracks instead of 32, the other omissions tend to be Midi exotica, features which may be nice to have but which you could probably live without.

The Midi file standard, which has been much talked about in the past, allows you to transport files from one sequencing package to another. It has now been officially adopted by the IMA (International Midi Association) and is already incorporated in many programs. We should soon see it implemented in all Midi software.

We were rapidly in danger of returning to those pre-Midi days when you were virtually forced to buy all your gear from one manufacturer in order to ensure compatibility between items.

The standard will allow you to pick and choose the best individual programs for your own use and as interactive and multi-tasking packages gain in popularity that will become increasingly important.

Some of the products on show at Frankfurt may take a while to filter through to the shops, but available now (I know because they're lying on my desk) are Hybrid Arts' EZ-Score Plus (£84.95), distributed by Syndromic Music, and the very latest version of MidiDrummer (£39.95), version 1.5a, from Bit By Bit Software.

#### MIDI SOFTWARE SUPPLIERS

Bit By Bit Software, 13 Spencer Street, Lincoln, LN5 8JH. Tel: 0522 40205.  
MCMXCIX, 9 Hatton Street, London, NW8. Tel: 01 258 3454.

Sonus International Limited, P.O. Box 18, Wokingham, Berkshire, RG11 4BP. Tel: 0734 792699.

Sound Technology, 6 Letchworth Business Centre, Avenue One, Letchworth, Herts, SG6 2HR. Tel: 0462 480000.

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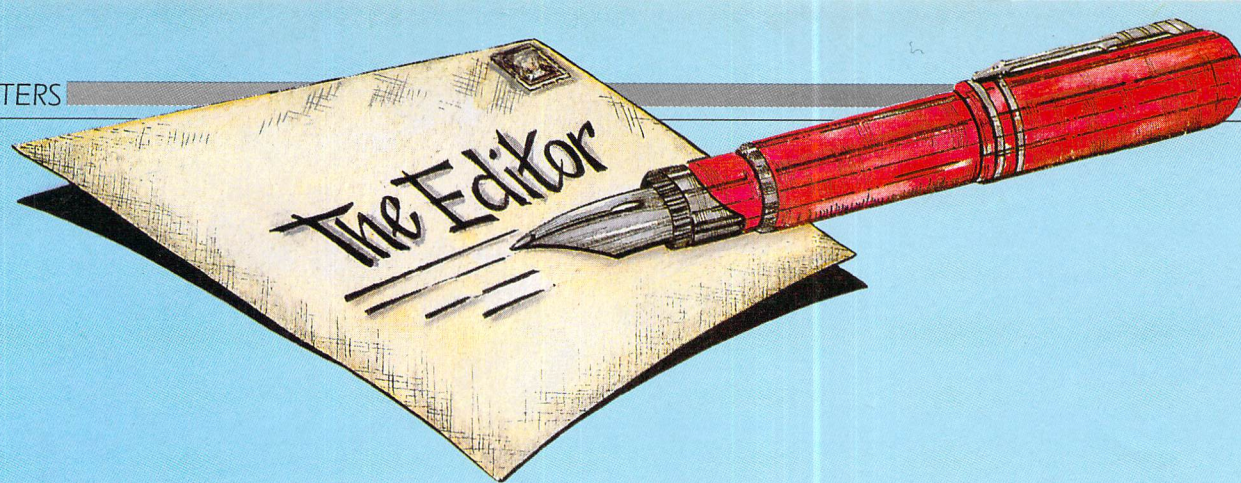
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## Basic changes in new version

FOR those of us who have recently bought STs, it would seem that a revised version of Basic is supplied on the language disc. While the Basic manual does list the differences, it does not explain clearly how to modify existing programs to work with the new Basic.

For example, the Colours of the Rainbow program – Atari ST User March 1988 – does not work, as the command DEFSEG is not allowed.

And when do you use PEEK, POKE-B or -W or -L? How does GEM-INTIN, GEM-INTOUT and so on replace GINTIN, GINTOUT and so on? Straight-forward substitution does not work when calling GEMSYS to change text style, mouse icon and so on.

I asked my local dealer but he was unaware that any changes had been made to ST Basic, and was unable to help. If you can't help either, could you give me the address of an Atari UK information office which I could write to?

All my technical books are centered around the old Basic and I can learn nothing from them. – **M.J. Dack, Lingwood, Norwich.**

● There are quite a few differences between the old and new versions of ST Basic – too many to list here. We hope to have an article in next month's issue dealing with these and showing how to convert old ST Basic programs to the new dialect.

## Sorting out DIP switches

I HAVE just bought a dot matrix printer from a second-hand computer shop, but there was no manual with it. I want to set it up to dump Degas Elite and Quantum Paintbox pictures, but at the moment it is getting extra line feeds from somewhere which distort the dumps.

I have been told that there are DIP switches inside the printer, but without the manual I don't know which one does what.

I think the printer is a Shinwa, but even that I'm not sure about as the name badge is missing, and the only identifying mark is a small badge marked CP80 type 1.

*I know this is not very helpful, but I would be very grateful for any information you or your readers could supply.*

– **Matthew Adlard, Fishponds, Bristol.**

● We are not familiar with this make of printer, but there is a simple method to find out which DIP switch is responsible for sending line feeds.

If you are not sure where the switches are, look at the back or inside of your printer. There should be a small gap in the casing, with one or two banks of tiny switches just inside.

Using a small flat-bladed screwdriver, flip the first switch and try a test print. If the effect produced is the wrong one, flip the switch back to its original position and try the next one.

Note that the printer must be turned off and on again after changing a DIP switch's position, or the change will not register.

## Printing in Portuguese

HAVING upgraded from a Spectrum 48k to an Atari 1040 STFM, I'm still missing some old tricks I used on the Spectrum. How can you force Caps Lock from Basic? How can you redirect the ST to use a customised character set? Where do I find the pointer to the set in the rom?

This last question is quite relevant for Portuguese users, as we use a lot of characters not included in the default Atari set.

If I could redirect the ST's internal character set pointer I would be able to use word processors, document processors and so on, in real Portuguese. Can you help? – **Paulo Cambraia, Portugal.**

● Some packages do allow different fonts to be loaded – particularly desktop publishing software. The text editor Tempus and the document processor Signum 2 both allow you to use a variety of fonts. This means you can design your own Portuguese fonts using Degas Elite for instance, and load them into Tempus.

The ST stores and generates its characters in a completely different way to the Spectrum, and the system used is vastly more complex and more powerful. It is not a simple matter of redirecting a pointer to your own character set, as on the Spectrum. And the characters aren't a simple 8 x 8 matrix either.

In high resolution monochrome with the 1985 issue operating system the 16 x 8

font is located at \$FD395E (look at location \$2924 for the address of the font with other versions of the operating system).

This can be copied into ram and the pointer at \$2924 set to the ram copy, then all OUT 2,... commands to the V52 emulator will use the ram font. You can redefine any of the 256 characters.

The font data is stored in a strange way. Each character is one byte wide and 16 bytes high, and a bit set means a pixel is lit.

The top row of each of the 256 characters is stored first, then the second row, third and so on. We hope to cover this topic in more detail in a future article.

The Gem Bios trap #13, function 11 enables you to set the state of the mouse buttons, Caps Lock, Alternate and left and right Shift keys. This short Fast Basic program shows how to set Caps Lock – the status is in bit 4 of the byte pushed on the stack:

```
1 REM Set Caps Lock
2 CLS
3 INPUT "Set Caps Lock on or off ",c$
4 IF RIGHT$(c$,1)="/" OR RIGHT$(c$,1)
  ="F" THEN Caps=0 ELSE Caps=16
5 RESERVE code,100
6 FOR pass=0 TO 1
7 [ OPT pass
8   ORG code
9   MOVE.W #Caps,-(A7)
10  MOVE.W #11,-(A7)
11  TRAP #13
12  ADDQ.L #4,A7
13  RTS
14 ]
15 NEXT
16 CALL code
```

## Number of the beast

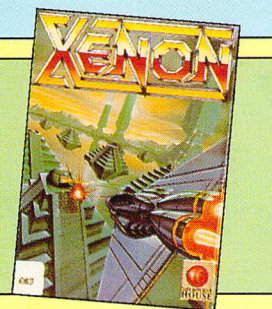
I HAVE seen several references in Atari ST User to the latest version of the Tos roms being 1.09. I bought my 520STFM at the end of January 1988, and according to my information the Tos roms in my ST have the advanced features introduced by the latest version – fewer disc exchanges on single drive copies, and sectors skewed from track to track.

But if I examine location \$FC0002 of the Tos header – which I believe holds the version number – the result is 1.02. I have also had the opportunity to examine another new 520STFM and also a 1040



## 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 F. Isaacson will receive *Xenon*, which is reviewed on Page 40). 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.



### Starglider cheat mode

THANKS for the magazine. I find the reviews especially useful when buying software. Keep up the good work.

Concerning British Telecom's System X exchanges, I have heard that their use will make modems unnecessary as the new exchanges are digital. Is this true, or is it yet another BT rumour? When will it come into use?

Other ST users may be interested in a form of cheat mode for *Starglider*. It involves no fancy codes or pokes at all. When playing the game, if you fly into an object instead of shooting it, the number of points notched up for that object is increased.

Obviously this does not work with mines, missiles, walkers, stompers or the elusive *Starglider One*, and you must watch your shields carefully. The table

below shows the improved scores.

When you first enter the game from the base, you will notice that a couple of missiles fly overhead. Without touching the right button, turn to the left as soon as you leave the first base. After about 180 degrees you will catch a glimpse of *Starglider One* on the horizon. This works every time, and is an easy way to score a couple of thousand.

Lastly, due to all this *Starglider* playing, the contact for my left mouse button has worn down. I don't want to waste money on a new mouse, so can you tell me where I could buy a new pressure switch? – **F. Isaacson, Lymington, Hampshire.**

● Thanks for the *Starglider* tips. British Telecom's exchanges used to be purely mechanical systems, but are now being changed to computer controlled, though still mechanical. The next stage of development will be System X in which the connections will be made within the com-

puter's memory. Finally comes ISDN, which will use a coaxial or fibre optic cable to feed data in a similar manner to an RS232 system. No standard has been agreed upon yet, and it will be well into the 1990s before it is implemented.

Modems will still be needed to convert the computer's digital signals to the telephone system's analogue signals.

Can any reader help with the mouse problem?

Object	Laser	Ramming
Drone	500	850
ATV	100	250
Tank	200	350
Bute fighter	120	500
Skim fighter	250	550
Juno cannon	400	800
Lotus Starfighter	290	600
Tri-launcher	200	410
Pyramid launcher	275	450
Laser base	50	50

STFM, and both returned a version number of 1.02.

Could you resolve this query for me? – **Chris Gale, Hinchley, Leics.**

● To find out which version of the operating system you have, format a blank disc, switch off and boot up with it. Save the desktop and look at the date stamp on the file – if it's 1985 you have the old version.

### Price without the power

I HAVE found my Atari 520 STFM to be a very enjoyable and easy to use computer. Unfortunately the power supply has failed on several occasions and now needs replacing altogether.

However, these PSUs are scandalous at £100 plus VAT, making it uneconomical to replace my Atari, as new machines are rapidly approaching the £200 mark.

"Power without the price" is fine in theory, but it looks as if reliability has suffered as a consequence. I have yet to decide whether to take another risk on Atari, or wait and buy a Commodore Amiga in the near future. – **L.J. Hallett, London.**

● We have had one or two problems with our STs, but that's understandable as they get more use, bashing, carrying and

general wear and tear in a week than most micros get in a year. Have any other readers experienced reliability problems?

### Games tips

HERE are a couple of tips for ST games: *Eco* – pressing Control+S will take you to the gene changing screen. Each time you do this you may change another gene until all of them have been altered.

10th Frame – to get a perfect score of 300 choose the professional level and point the cursor in line with the front of the pins and slightly to the right so as to be in between the middle and the first pin on the right. Then press the button and don't let go until the ball rolls. This should always get a strike. – **Iain Laskey, Great Wakering, Essex.**

### German checksums

AS a regular subscriber to your magazine and an ST Basic-only programmer, I have enjoyed your tutorials in this language. I sympathise with many others who write to you and groan when a listing is given in another language.

Therefore your latest issue was a boon

for me, with the listing Printer Buffer given in two languages.

Your 8 bit sister magazine Atari User lists programs with a check-summer – why not you? I would like to draw your attention to the German magazine Happy Computing which has published and uses an interesting checksum for the Atari ST.

Called the MCI, it is entered in ST Basic. It creates a TTP application on the disc which allows you to type the hex dump of a program specially created to include the sum of each line.

The magazine prints the listings in various languages as well as the hex dumps.

This is – at last – a real computer Esperanto, allowing anyone to type in whatever program they want from the magazine. And as typing in hex dumps is not the greatest fun thing imaginable, MCI allows you to break off and continue later.

I hesitated to send you photocopies to illustrate my point, because they – like you – print messages concerning illegal reproduction, so I'll simply give you their address for back issues if you're interested: Markt & Technik Verlag A.G., Hans-Pinsel Strasse 2, 8013 Haar bei Munchen, West Germany.

Happy Computing is a magazine of

Turn to Page 108 ►



## ◀ From Page 108

general interest. Its special issues 19 and 22 are devoted to the ST and contain the items I have described (price DM 14 each). – **J.M. Kaltenrieder, Switzerland.**

● We'll look into the possibility of using a checksum utility, but the problem of getting it to work with all languages is far from simple – the format of each one is so different.

## Ram upgrade hints

WE read with interest Richard Phillip's ram upgrade article in the March 1988 issue of Atari ST User. While we found it a lucid and helpful explanation of the upgrade, we noticed a couple of errors which could cause readers some problems with the project.

Firstly, in Step II – 520 STFM – we feel that the value given for the missing RAS/CAS resistors was incorrect. During a recent upgrade of our own machines prior to seeing the article, we noted that the bank one RAS/CAS lines were filtered by 68 ohm resistors.

The data bus appears to use 33 ohm values, and while the exact value for RAS/CAS is not highly critical, the use of too low a resistance would compromise the desired noise filtering effect. We would suggest that owners of these machines use 68 ohm resistors here.

Secondly we would say that owners of the 520ST and STM computers should not go to Section III as directed in Step I, since it is difficult to test ram that has not been fitted! Would that all projects were so simple... perhaps Step II should have been Step IIa?

We look forward to many more interesting features and projects in your excellent magazine. – **P.J. Rihan and S.J. Purdey, Croydon, Surrey.**

● Thanks for the information. One other point is worth noting – the capacitors used are polarised, so take care to insert them the right way round.

## Winter of discontent

I RECENTLY bought an Atari STFM after intensely saving up for six months. I used to have an Amstrad CPC 464, so I was naturally impressed by the difference.

In the March issue of Atari ST User you reviewed Winter Olympiad 1988, and having read the review I decided to empty my bank account and buy the game.

On that same day I was playing it when something like "Do you want to save records?" came up on the screen. At this

point I turned away and my younger sister pressed Y and Return, saving on to disc A. Now I can only run the downhill event – the rest won't load. I tried to put the file OLYMPIAD.REC into trash but it would not work.

I think it is stupid how easy it is to record over the system disc. I know it says in the instructions to be careful, but only in small print at the end. At the least the warning should be on the disc as well. Is there anything I can do? – **Ian Rowley (13), Nuthall, Notts.**

● You'll have to return the original discs to Tynesoft with an accompanying letter and see if it will replace them for you.

It wouldn't have been too difficult for the program to check that the disc in the drive wasn't the original and abort saving if it was. It's a pity this wasn't done.

## Penpals wanted

I AM looking for penpals, I own a 1040STF with dual drives and a colour monitor. I would like to get in touch with other ST users with an aim to swapping hints, tips, information and so on. If you are interested, male or female, please write – all letter replied to. – **Kevin Howe, 6 Whitehall Gardens, Retford, Notts DN22 6JH.**

## The flop that flips

I OWN an STFM with which I am delighted, and I have been a subscriber to your magazine for some time. I find the articles, hints and tips and so on extremely useful, but find some of the games reviews rather misleading – the standard of most ST games does not appear to be up to the machine's fullest capabilities.

However, I recently attempted to use the disc formatter written by Glenn Williams in C from the December 1987 issue of Atari ST User. My Lattice C compiler passed it with no errors, but a problem of Undefined symbol occurs at link time.

The symbol is flopfmt, which I believe is the call to XBios to format the disc. A look into OSBIND.H revealed floprd and floprw as XBios(8) and XBios(9) respectively, but no flopfmt – XBios(10). Does this mean that the call is not supported?

Also, this letter has been draughted on an Amstrad PCW8512. Since the ST is capable of CP/M emulation, is it possible to link both machines together and download/run Amstrad software via an Amstrad CPS2852 interface?

If not, then what purpose does the emulator serve, as I am unable to obtain any information regarding its uses? Perhaps the magazine could run a few

articles.

Since I am both a novice at C and blind regarding the internals of the ST, I am afraid that I am in need of some kind of assistance. – **N. McNamara, Brackla, Mid Glamorgan.**

● You can add XBios(10) by adding:

```
#define Flopfmt(a,b,c,d,e,f,g,h,i)
        xbios(10,a,b,c,d,e,f,g,h,i)
```

all on one line at the start of the program listing.

You can link a PCW to an ST and transfer files across. However the easiest way to get CP/M software is to log on to a bulletin board and download some of the public domain packages.

CP/M software is good, but it won't take advantage of the ST's memory, Gem, graphics, and so on, so it can't really compete with ST-specific packages.

## Looking for a 68000 upgrade

I WONDER if you could give me some help and advice? I am the owner of an Atari 1040 ST and am very pleased with the machine.

Firstly, do you know of an internal processor upgrade for this machine? I have heard that it is possible to replace the 68000 chip with a 68010, thus giving a power gain of some 30 per cent. Is this true, and if so are the pins compatible?

Also, would it be possible to switch between the two processors, and would the 68010 be incompatible with the 68000 instruction set in any way?

Secondly, I have followed the upgrade path from the 520ST to the 1040ST and am now considering upgrading to the Mega 2 ST. I have heard of the Tos differences between my existing machine and the new Megs, so do you know of an internal board that would allow me to swap between the two versions of Tos? If there is such a board, would having the blitter in place make it unusable?

And finally, could you tell me roughly which percentage of 1040ST software might not run on such a machine? – **Andrew Gane, Fallowfield, Manchester.**

● If you could simply swap the processor for a more powerful one you wouldn't gain any advantage, as the extra features and instructions wouldn't be used by software written for the ordinary 68000.

There isn't an internal board to switch between the old and new operating systems.

Nearly all the problems associated with the new operating system stem from the fact that it grabs a little more ram on boot-up than the old version. Memory is not a problem on a Mega ST, so there shouldn't be many compatibility problems.



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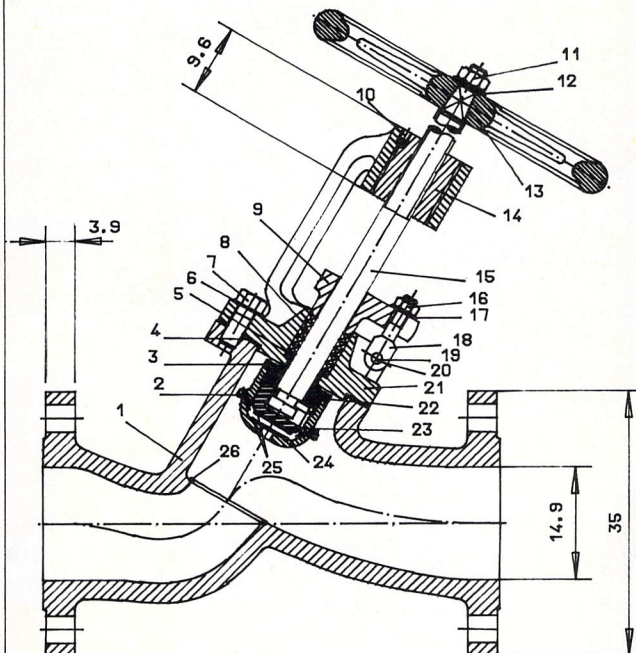
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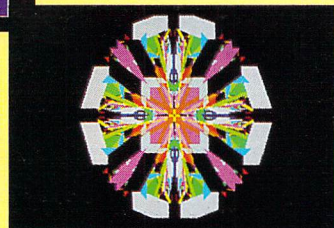


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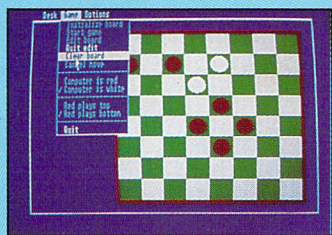
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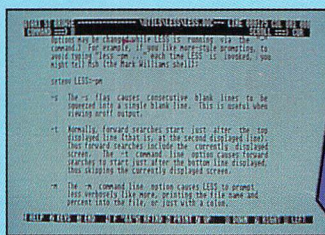
H – High resolution (requires monochrome monitor)

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L – Low resolution (requires colour monitor or television)



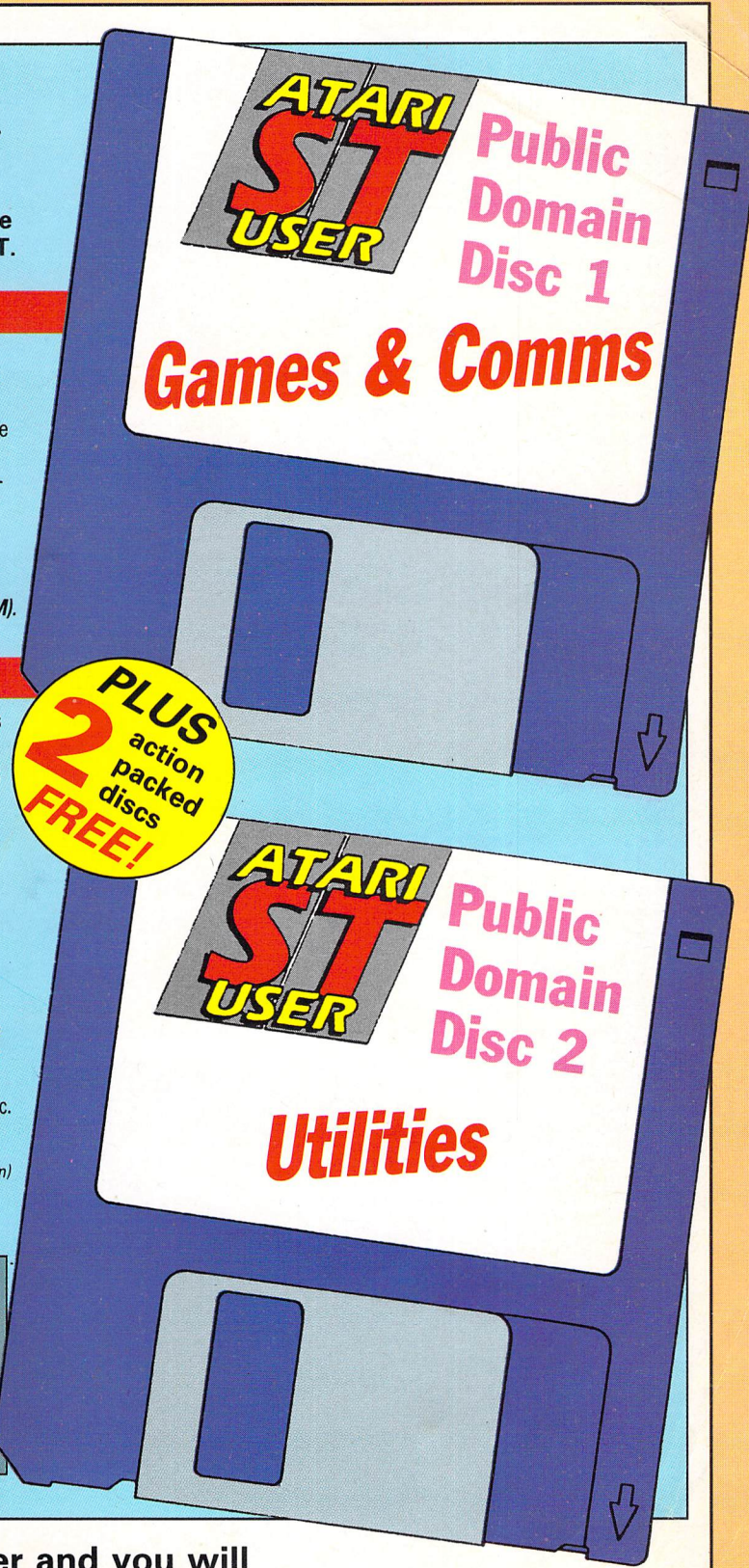
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**August issue:** Reviews – CAD 3D-2, Lattice C upgrade, Animatic, ST Doctor, games, books. Programming – 3D graphics (free 3D glasses), Gem, 68000 assembly language, wireframe graphics, sound. Features – comms, Gallery, Adventures.

**September issue:** Reviews: Art Studio, Easy-Draw, Assempro, CAD 3D-2, K-Max transputer, HiSoft Basic, Barbarian, Hardball and Hades Nebula. Listings: Improve disc access timings, create 3D wireframe graphics, play Code Breaker.

**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.

**December issue:** Reviews: Forth, sound samplers, four-headed printer, Pascal,

Terrorpods, Addictaball, Impact and much more. Listings: Knight on the Tiles and multi-formatter. Construct your own printer driver, choosing a word processor.

**January issue 1988:** Reviews: Midi Maze, Star Trek, Indiana Jones, Nord and Bert, K-Word 2, TextPro, TuneUp, Fortan, PaintPro. Listings: Alternative function key definer, Sliding block puzzle. Features: Atari ST User show report, Gallery, adventures with Brillig.

**February issue:** Reviews: Midi Maze, Star Trek, Indiana Jones, Nord and Bert, K-Word 2, TextPro, TuneUp, Fortan, PaintPro. Listings: Alternative function key definer, Sliding block puzzle. Features: Atari ST User show report, Gallery, adventures with Brillig.

**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.

**April issue:** Reviews: Captain Blood, Eco, Super Sprint, Black Lamp, Wizball, Skyriider, Solomon's Key, Bard's Tale, MCC Assembler, Protext, True Basic, A Magic digitiser, GFA Vector and Companion. Listings: Mandelbrot upgrade, custom keyboard, disc verify. Features: Gallery, adventures, product guide.

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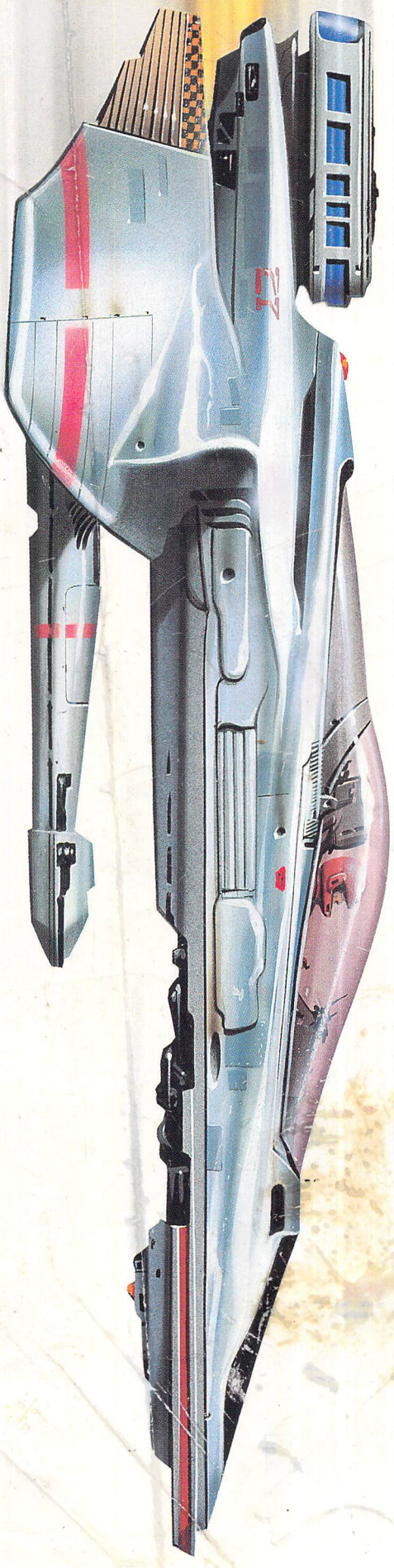
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