ATARI ST USER

The top-selling Atari ST magazine

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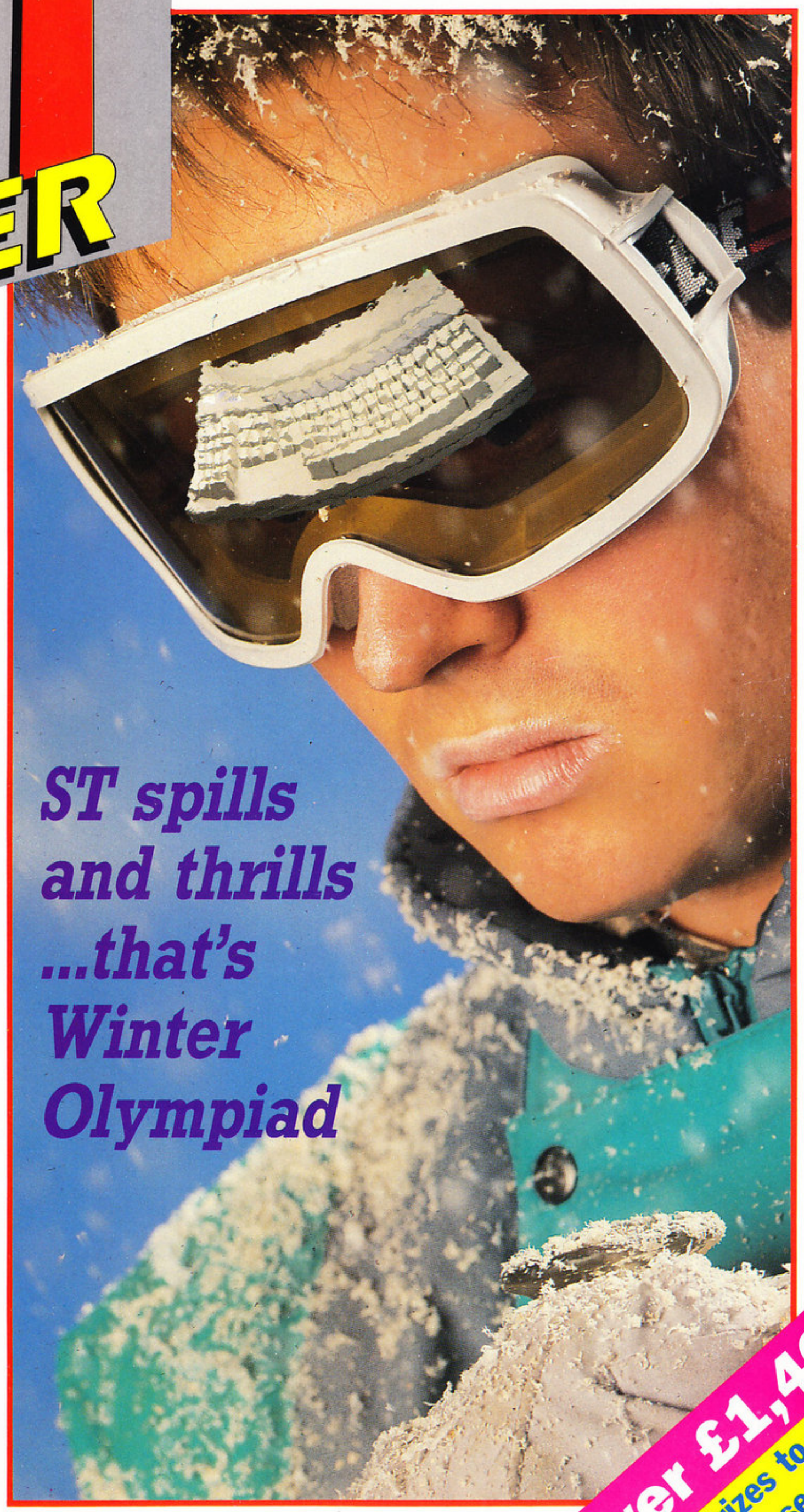

SOFTWARE
Wrestling, Bad Cat, Marble Madness, UMS, Hunt for Red October, Pengy, Bubble Bobble, Chamonix Challenge, Tanglewood, Scruples, Backlash, Frost Byte

REVIEWS
Word Perfect, PCB Designer, Tempus, PD disc utilities

FEATURES
The stories behind Magnetic Scrolls, US Gold, Tynesoft

ADVENTURES
Pawn hints and tips, plus a review of Leisure Suit Larry

LISTINGS
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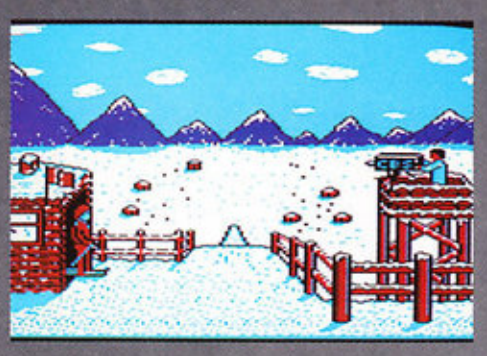

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FEATURES

News

Up-to-the-minute stories, comment and information from the rapidly expanding world of the Atari ST. Plus the latest ST software chart.

7

Adventure house

The inside story of Magnetic Scrolls, one of the most famous names in graphic adventuring on the ST.

15

Memory upgrade

Discover how you can turn your 520ST into a 1Mb 1040 – for a fraction of the normal cost.

21

Adventures

Hints and tips for The Pawn, plus a full review of Leisure Suit Larry in the land of the Lounge Lizards.

26

Solid Gold

Find out what US Gold is going to be doing in 1988 as we take a behind the scenes look at new developments and releases.

31

Company profile

We reveal how Tynesoft battled long into the night to get Winter Olympiad ready for 1988.

47

User port

The last part in this fascinating series describes how to implement the user port as an input device.

71

Mailbag

A selection of the brightest and liveliest letters from our ever-growing mailbag.

90

GAME

Puzzlemania

Brilliant full colour graphics feature strongly in this superb test of skill, dexterity and mental agility.

77

GALLERY

This month's Gallery features impressive work from three young micro painters from Britain and Sweden.

68

CONTENTS

Winter Olympiad '88

A detailed review of Tynesoft's spectacular sports simulation based on the Winter Olympics.

48

PROGRAMMING

Machine code

Part 8 of this series looks at the complexities of printing sprites.

63

Pallette switching

Using a combination of clever 68000 machine code and ST Basic we demonstrate how to display up to 512 colours on-screen at once.

74

SCRAP BOOK

This month's selection of short but useful utilities includes a screen resolution setter and a security file scrambling system.

81

Selector

Now you can pick your desk accessories with ease using this superb utility written in C.

84

Mileage calculator

Is your car a mile miser or a gallon guzzler? Find out with this great utility.

89

REVIEWS

Tempus

Said to be the fastest text editor ever for the ST – we take a closer look at this remarkable piece of software.

29

PD Disc utilities

If you only get what you pay for, just how good is free software? A selection of PD disc utilities come under the microscope.

33

Software

Wrestling, Tanglewood, Backlash, Marble Madness, Frost Byte, The Hunt for Red October, Bad Cat, UMS, Pengy, Scruples, Chamonix Challenge and Bubble Bobble.

34

Quick Peeks

A short but informed look at some recent games releases for the ST.

45

PCB Board Designer

A product destined for the screens of budding electronic design enthusiasts. Is it worth the money?

51

WordPerfect

The industry standard word processor finally arrives on the ST. We find out if it really is so perfect.

57

COMPETITION – MIDI MANIA

A total of more than £1,400 worth of prizes to be won, including a fantastic Yamaha Midi synthesizer and Steinberg music software.

73

FAST BASIC

JUST LOOK AT THE REVIEWS IT HAS RECEIVED IN THE PAST— NOW IT'S HALF THE PRICE!

REVIEW

Computer Concept's Fast ST BASIC is the most powerful of the currently available BASICS. It sports a tremendous number of commands, giving the user unprecedented control over the program. It is also simple to use, provided on cartridge and totally GEM-driven... Fast BASIC also has the best GEM support of any of the BASICS.

START, the ST Quarterly

REVIEW

BASIC really is phenomenal value for money.
'If you need a good programming language for home, business or educational use, buy FAST BASIC. If you would like to program GEM applications but do not feel competent enough to tackle C, buy FAST BASIC. If you need a macro assembler with a good editor and environment, buy FAST BASIC.'

ST User magazine—Oct 86

REVIEW

'The execution speed has to be seen to be believed.
If you own an ST even if you are a C or machine code programmer you should own a copy of FAST ST BASIC.
I don't know of a BASIC on any other machine which is so feature packed and yet still easy to use.'

Atari User—Nov 86

Fast BASIC has now been released on disc at the amazing price of £39.00 + VAT (£44.85 inc)

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England, Telephone (0442) 63937

VISA Access

Macintosh emulator for the Atari ST

EIDERSOFT has announced the release of ProficomP's Macintosh emulator – priced at £169.95. Aladin – the Macintosh Enhancer – comes on cartridge with software support on disc. Once installed in an ST, it's said to run over 90 per cent of all Apple Macintosh programs.

The Macintosh 512 is based around the 68000 – the same central processor as the ST – hence the accurate emulation.

An Eidersoft spokesman told *Atari ST User*: "Aladin emulates the Macintosh so closely even Apple would have to look twice. In fact it runs all unprotected software that's been written according to Apple's own guidelines. Well-behaved software will even make full use of the ST's 30 per cent larger screen.

"In addition, many non-compatible programs can be patched to work and because the ST runs almost 20 per cent faster than the basic Macintosh, programs run faster too."

But, due to hardware inconsistencies, the ST can neither read nor write real Macintosh discs. In response, Eidersoft is offering a free service to transfer legally bought software to the ST.

However, it is expected this problem will be resolved very soon with the arrival of a fully compatible Macintosh-type disc drive.

It all sounds too good to be true – and there is a problem. To get the software to work on an ST requires two extra roms – from a Macintosh. Because of legal difficulties, these are not supplied with the package and must be obtained separately.

Costing around £50, the roms are not generally available, although Eidersoft says. "We can advise buyers of the product where they can obtain the roms for the cost of a telephone call."

However Apple (UK) itself is very upset by the affair. Spokesperson Sonja Garsvo told *Atari ST User*: "It is our policy not to supply these roms to anyone. They are circulated for internal use only.

"New roms can be issued to clients only through registered dealerships, on an exchange basis. That is, as an upgrade or replacement.

"We monitor the issue of all new roms to the general public very carefully. I assume these roms can only be obtained illegally if at all.

"Of course, we can't endorse or support the product and we're very concerned such a device is on sale."

The response from an Apple dealer was more obtuse. "There is no way we would supply roms to anyone. Besides, this unit emulates four-year-old technology.

In comparison to today's Macs it'd be about as much good as a one legged man at an ass kicking contest".

A touch of the Lotus

ATARI distributor SDL has announced the launch of MasterPlan, a new Gem-based Lotus 1-2-3 compatible spreadsheet for the ST range.

John Arundel, marketing controller for SDL (01-309 0300), said: "At a price of only £99.95, MasterPlan sets the new spreadsheet standard for the ST".

Written totally within Gem and modelled on Lotus 1-2-3, it uses an entirely new, simplified organisation allowing quick and easy access to the most frequently used commands.

MasterPlan uses most commands identical to Lotus 1-2-3 version 1A but adds an interface. The program reads and writes Lotus and VIP Professional data files while extensively utilising the graphics capabilities of the ST.

It includes Lotus' 50 plus built-in financial and mathematical functions, and an 8192x256 spreadsheet grid.

Pictures in the mirror

AMERICAN software developer Alpha Systems has released Powerprint St. It can print pictures from Degas, Neochrome and others, up-and-down or sideways and in normal or inverse. It can even print a mirror image with left and right reversed for such jobs as Tshirt iron-ons.

Alpha (0101 216 467-5665) says Powerprint is the only ST print program that can print wall-sized posters more than seven feet across on a standard printer and paper. The task is accomplished by printing in strips and taping them together.

A unique shading feature lets the user create full colour printouts on any dot matrix printer with colour ribbons, and pick the shades of grey and dot patterns.

Powerprint comes with a desk accessory called Screen Saver which can capture and save almost any ST screen. Price $39.95.

SALES ARE BOOMING

THE rush to buy Atari ST computers earlier this year has left dealers with a shortfall of between 15,000 and 20,000 machines. Demand was so great that the company had to fly in extra computers for delivery to suppliers every three days.

Because of the popularity of the ST, Atari's target to have 100,000 computers installed by the end of 1987 was exceeded.

However, the huge demand meant prospective buyers hoping to get a post-Christmas bargain had to be disappointed.

Any price cuts have been definitely ruled out until 1989 at the earliest. Paul Welch, Atari's national sales manager said: "The way we look at it we have an unfulfilled demand from customers who haven't got another product to choose from".

Radical database

WHAT is claimed to be a radical new concept in databases has been released for the ST by business specialists Precision Software.

Superbase Professional has been designed to provide all the tools needed for a complete software environment, says Precision marketing director Bruce Godfrey, adding: "It makes the word database obsolete".

A highlight of the package is a special forms editor which allows creation of intelligent multi-page forms combining colour, lines, boxes and fields for custom applications.

Forms can be structured to handle complex multi-file date entry and review requirements without programming.

Superbase Professional's database management language has been devised to make it easy for the non-professional to create powerful applications.

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MEGA ST 2 + SC1224	£1115
MEGA ST 4 + SM125	£1115
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PERIPHERALS

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ATARI SF314	£169
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CUMANA 1MB 5.25"	£199
ATARI SH204 HARD-DISC	£499
ATARI SH205 HARD-DISC.	£535

MONITORS

ATARI SM125	£125
ATARI SC1224	£335
PHILIPS 8833 (MED RES) INC CABLE	£275
PHILIPS 8853 (HIGH RES COLOUR) Inc Cable	£299

PRINTERS

ATARI SLM804 LASER	£1115
ATARI SMM804 DOT MATRIX	£100
EPSON LX86	£180
EPSON LX800	£230
EPSON FX800	£350
EPSON FX1000	£450
EPSON EX800	£450
EPSON EX1000	£570
EPSON LQ800	£450
EPSON LQ1000	£690
EPSON LQ2500	£790
TOSHIBA P321SL	£550
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PANASONIC KX-P3131	£249
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STAR NX15	£299
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STAR NB24-15	£595
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SCANNER CAN HANDLE 3D OBJECTS

A FLATBED scanner with the ability to scan three dimensional objects has been released by Signa Publishing Systems (0252 874406).

Compatible with a number of micros, including the ST, Hawk offers fast scanning time – 10 seconds for an A4 page – and doubles as a photocopier, line printer and screen dumper.

The Hawk has 16 levels of grey scale available, and the Gem-based software offers image regeneration at up to 300 x 300 dots per square inch. Images are saved in Dos .IMG format, so exporting files into Fleet Street Publisher and other DTP packages is straightforward.

Output is direct to either dot matrix or laser printer, and an integrated paint program allows for image manipulation with programs such as Degas.

Price £1250.

Calligrapher bugs have now been cured

FOLLOWING rave reviews, Computer Concepts (0442 63937) sold out of its desk top publishing package Calligrapher at the recent Atari User Show.

However, a black cloud was gathering on the horizon. Many buyers discovered – some within minutes – that the package contained bugs and could crash at the slightest provocation.

Defending Calligrapher, Computer Concepts' head, Charles Moir told *Atari ST User*: "The version on sale at the show did suffer from bugs – however, it's virtually impossible to guarantee over 200k of machine code won't contain the odd error."

He was quick to point out not all of the problems were errors in the package. "Calligrapher relies partially on a Tos patch called Gdos which allows the loading of special fonts and so on", he said.

"Early versions of Gdos – which is supplied by Atari themselves – were bug-ridden to the extent that they could crash the system completely. Although this problem has now been sorted out for the monochrome versions of Gdos, the colour versions are still bugged.

"Due to memory restrictions on the 520STs, Calligrapher itself has now been split into two versions – Junior and Senior. In fact over the past few months, the whole thing has received a major revamp.

"We are now dispatching the updated version directly to registered users – free of charge. Owners who haven't yet registered should do so now to receive support and amendments. At the end of the day, if people still aren't satisfied, we offer a no-questions-asked refund".

PCW Show doubts

By CHRISTINE ERSKINE, formerly editor of Popular Computing Weekly and now special correspondent to Atari ST User

MOVING the 1988 PCW Show – now to be renamed The Personal Computer Show – from its now-established Olympia venue to Earl's Court is apparently causing some anxiety in the Atari camp. The company is debating whether to take a stand at all at Earl's Court.

The reason is that the new venue cannot offer Atari anything like the prime site it had held at Olympia for the past three shows.

In previous years, of course, the Atari stand was easy to find, exhibiting in the "corridor" which separated the National Hall leisure stands from the library atmosphere of the business hall in Olympia 2.

Machines such as the ST range which effectively straddle the leisure and business market, and software companies wishing to exhibit both heavyweight products and games, made this location ideal, if not essential. Certainly, the difference in attendance between Atari's excellently situated site and the rather ghostly Commodore "village" off the ground floor of the National Hall was marked.

A location such as this simply doesn't exist at Earl's Court, even if there is more floor space there to accommodate the increasingly large and exotic stands which software houses have taken such a liking to.

An Atari spokesman commented: "Atari has its own shows twice a year; it doesn't seem essential to be at PCW. After all, we don't go to the Which Computer? show either".

This is a reasonable argument. Machine-specific shows attract people who want to see – or buy – a particular product, who don't want to struggle past crowds of people gathered around a stand that's of no relevance to their own computing needs, or who simply want to see what's on offer for their own micros.

However, at any specialist show you demonstrate to the converted. At a general show like PCW, there are thousands of people who will walk past who may never have seriously considered an ST, and yet will stop and look because their attention has been caught by something.

And The Personal Computer Show is the flagship show of the year. Not just for the companies exhibiting, but for the 60 to 70,000 people who attend because they want to see what computers are up to and what will be on the market in the next twelve months. If Atari – or any other major manufacturer – isn't there, then they may well slip out of people's purchasing considerations.

However, it appears from the Atari camp that as far as the show is concerned, the site within the show was more important than the exhibition itself.

No laptop ST – Atari

ATARI, with a large number of new products already lined up for release this year has firmly squashed rumours that it is about to release a laptop version of the ST.

Such a machine could still be on the cards, however: "The laptop might exist in prototype form, but, quite frankly, we've got a lot of new products to market at the moment in the UK said a company spokesman.

"Add to that the impending product launches for the 80286 and 80386-based machines and we've got our hands full at the moment he added.

Walkman winner

THE November Pandora competition attracted a superb number of entries. First prize of a Sony Walkman was won by PJ Westgate of Norwich.

There were 20 copies of Pandora's Eagles Nest for the runners up: F Safstrom, Sweden; N Richardson, Camberley; P King, Wells; J Akerman, Surbiton; B Weatherstone, Meopham; C Neale, Blackpool; M Reed, Kenley; K Miles, Ballasalla; A McBean, Elgin; N Crozier, Malton; L Minton, Cardiff; L Rudd, Hornchurch; Yan Fa Li, Milton Keynes; S Greenwood, York; I Pollard, Reading; J Haspell, Birkenhead; A Sowerby, Castletown; A Campbell, Swanley; C Stanfield, Reading; and P Ioannou, Halifax.

Software houses try out Abaq

THE Abaq, Atari's revolutionary transputer-based supermicro, is expected to be unveiled before the end of the year.

It is reported to be faster than most minicomputers currently on the market.

Rumours about the machine have been circulating for some time, but now *Atari ST User* has learned from a company source that the first development machines have already been shipped to software houses.

However, the Abaq is not intended to compete with the ST. Instead it is aimed to dominate the relatively new multi-user system marketplace.

With an expected price tag of around £3,000 without monitor, it will provide fierce competition for workstations costing several times as much.

Much of the Abaq's power can be attributed to the employment of a single Inmos T800 transputer – a relatively new device capable of distributing its workload to other T800s connected to it.

The Abaq boasts 4Mb of ram and 1Mb of video ram. This vast amount of memory is called upon to support the machine's multi-colour modes, one of which displays a staggering 16 million shades.

The chip behind the graphics is being called Charity – a custom designed ULA (Uncommitted Logic Array), similar to the much talked about blitter chip – which takes colour into account and can transfer graphics information at the rate of 16 million pixels per second in monochrome.

Graphics of this calibre require the use of very special multi-sync monitors, with 140Mhz.

WHAT is said to be the first computer game from Russia for the ST – Tetris – has been released by MirrorSoft. A series of different shapes appear one at a time, and by using keyboard or joystick control you have to move and turn the shapes to make them fit together in a line across the bottom of the screen.

As your skill level increases the shapes appear more rapidly. MirrorSoft (01-377 4837) is so confident that Tetris will attract a cult following that it is organising a national competition with a first prize of a trip for two to Russia. Price £19.99.

ENTER THE PREDATOR

THE release of its latest major film tie in – Predator – has been announced by Activision (01-431 1101). Developed by System 3, it follows the film's story line very closely.

You play the part of Major Dutch Schaffer in charge of a commando unit assigned to rescue a group of prisoners. On reaching the enemy camp you find that your comrades have already been executed. After a fierce battle the tables turn and you become the hunted rather than the hunter.

Activision says that the game features hi-res graphics, dual speed sideways scrolling, and endless screens of pure arcade action. Price £19.99.

Gallup Software Chart

This month	Last month	Title (Software House)	Price	Month reviewed in Atari ST User	Comments	Marks from 10
1	3	**STAR TREK** *Firebird*	19.95	February '88	One of those games that belongs in every collection, even if it's just to prove how powerful the ST is.	9
2	6	**STAR WARS** *Domark*	19.95	January '88	If you never buy another arcade game – buy this one. You won't be disappointed.	10
3	•	**BACKLASH** *Novagen*	19.95	March '88	See the review in this issue.	10
4	•	**SUPER SPRINT** *Electric Dreams*	14.95	April '88	Watch out for the comparative review with Anco's Karting.	*
5	1	**BARBARIAN** *Palace*	14.99	January '88	Overall, Barbarian – The Ultimate Warrior is superb. You just can't go wrong if you buy this one.	10
6	12	**IMPACT** *Audiogenic*	14.95	December '87	The visual displays make excellent use of the ST's astounding graphics.	10
7	•	**RAMPAGE** *Activision*	14.99	April '88	See the review in the next issue of *ST User*.	*
8	2	**DEFENDER OF THE CROWN** *Mirrorsoft*	29.95	January '87	There's no denying that Defender of the Crown is a must for sheer entertainment value alone.	10
9	4	**BARBARIAN** *Psygnosis*	24.95	September '87	Easy to play, but far from simple to master.	9
10	•	**BUBBLE BOBBLE** *Firebird*	19.95	March '88	Also reviewed in this month's issue.	8

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

ATARI USER SHOW

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

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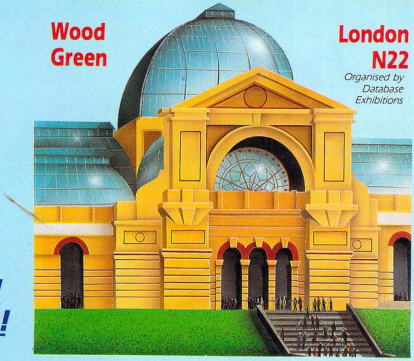

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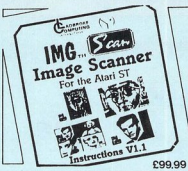

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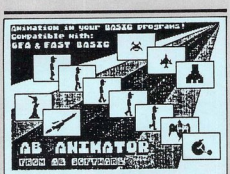

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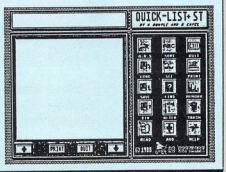

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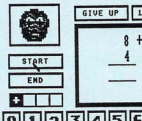

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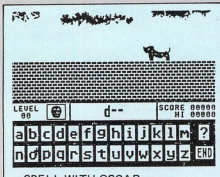

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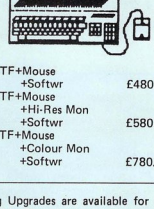

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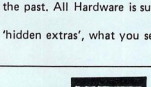

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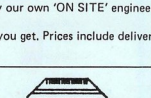

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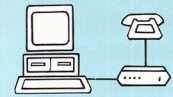

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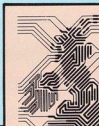

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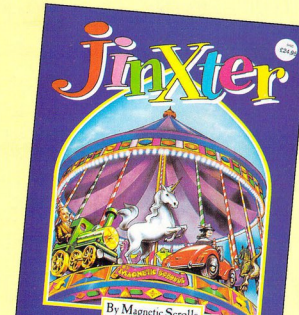
The arts that spell adventure



Mike Gerrard relates the graphic story behind Magnetic Scrolls

THEY say that software sells hardware, in which case Jack Tramiel must owe many an ST sale to the award-winning British adventure house, Magnetic Scrolls, and in particular the comparatively unknown name of Geoff Quilley.

Geoff's the artist who produced the ST pictures for The Pawn, most of those for The Guild of Thieves and 19 for the company's brand new release, Jinxter.

"It was the ST version of The Pawn that made us successful, and it's still one of the biggest-selling pieces of software for the ST", says Anita Sinclair, the company's co-founder and managing director, and who for many adventurers *is* Magnetic Scrolls.

One of the reasons for that is simply that it's Anita's job within the company to deal with press and publicity. She does more than just talk to the press, however. As managing director she's involved in every aspect of Magnetic Scrolls' work.

She is writing her own adventure, and in fact the initial success of the company is partly down to her little-known ability to turn out an arcade game or two!

This was after the first text-only version of The Pawn had been published by Sinclair Research for the QL. While waiting for other things to happen, Anita went to Firebird and showed the games to Tony Rainbird: He thought they were ok, but didn't sound too enthusiastic.

But while she was there she also demonstrated The Pawn. Tony loved it and said he'd buy all the budget games for the rights to all other machine versions of The Pawn. Fortunately she had only sold the QL rights to Sinclair.

The founders of Magnetic Scrolls were Anita, who'd been writing software on a freelance basis, and a friend of hers, Ken Hughes, who was leaving school and also wanted to write software.

They decided to team up and try to produce a really good arcade game, till Ken turned up one day with Hugh Steers, who had written a text parser. After a trial run with a small adventure, the team of three decided they needed a serious writer in order to produce a proper game.

At this stage Ken turned up with someone else, Rob Steggles, who was to write most of The Pawn and its follow-up, The Guild of Thieves. "The bulk of Guild of Thieves was actually written before The Pawn first came out, which was late 1985", Anita explained.

"Rob had said he was going to write another adventure for us, so we locked him in a hole for a while and he came up with what is basically The Guild of Thieves. Maybe we should lock him in a hole more often.

"The most important thing about an adventure is the writing, and if you can't write then that's that, you might as well give up and go home. You can learn programming, you can learn to use an adventure system, but you can't really learn to write in the same way.

"We don't think of graphics at all when we plan an adventure or are looking at storylines that we're going to go ahead with. We think primarily of the text because without that you don't have an adventure.

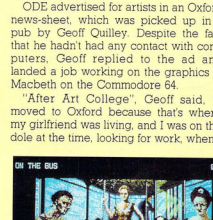
"The Pawn was written as a text-only adventure, but when it was decided that Rainbird was going to publish it, graphics were requested with it. So we said, 'Only if they're very very good". At this point Shakespeare and a pub in Oxford enter the rather haphazard development of the Magnetic Scrolls success story.

Oxford Digital Enterprises is the programming team behind such best-selling computer games as Trivial Pursuits and Yes, Prime Minister, although the company's first enterprise was an attempt to turn Shakespeare's Macbeth into an adventure game.

ODE advertised for artists in an Oxford news-sheet, which was picked up in a pub by Geoff Quilley. Despite the fact that he hadn't had any contact with computers, Geoff replied to the ad and landed a job working on the graphics of Macbeth on the Commodore 64.

"After Art College", Geoff said, "I moved to Oxford because that's where my girlfriend was living, and I was on the dole at the time, looking for work, when I saw ODE's ad in the paper. That was my first contact with computers.

"David Pringle of ODE later introduced me to Anita, who was looking for someone to do the graphics for The Pawn, so I submitted some samples. She seemed to like them and that's what led to a good working relationship with Magnetic Scrolls".



A typical busload of Aquitanian commuters

In fact, none of the several artists that ▷

◁ company uses have been trained in computer graphics. They all have conventional artistic backgrounds and experience, and are then trained in the use of the ST.

"All our artists work initially on the ST", Anita explains, "because that was the second version of The Pawn that we did, after the text-only QL version. At that time the Amiga was just a twinkle in someone's eye," and we already had the ST and a copy of Neo so we just got on with it and it's worked perfectly well-so why change it?

"I'd like to say that it was all planned and everything was carefully evaluated, but nothing about Magnetic Scrolls has ever been planned! The artists are only brought in when the adventure itself is fairly well-advanced, when the room descriptions are more or less complete and the exits and objects for each location have been almost finalised.

"Ideally, two artists would be involved in producing the 60 or so original ST screens that would make up a typical adventure, but this can increase to four or five because of the pressure of deadlines. The artists are called in and talked through the game, and they choose for themselves which locations they want to illustrate.

"I strongly believe that the only one who knows about art is the artist", says Anita Sinclair emphatically. "The artist will then be given a complete revealed location for each of the graphics that they're going to be working on.

"This tells them absolutely everything that's relevant to the place: Objects, exits, weather, general feel and atmosphere. No memory or other restrictions are given, and the next thing Magnetic Scrolls will see will be the finished screens.

"Admittedly I do tend to snarl at them if the pictures don't compress too well", says Anita, "but basically, the only technical restraints that we give them are the size of the screen, and even that they can go a little bit over if they like.

"They do know though, that we'll always drop pictures rather than text if we're pushed for memory. It's much simpler to save a chunk of memory by dropping a picture than by having to try to alter the text, which can start to affect lots of things. We had to drop two pictures on the ST version of Jinxter, for instance, because we ran out of disc space."

Geoff Quilley seems to thrive under such constraints: "When I've got the gist of the game, I choose the locations I'm going to illustrate. I have got certain interests in drawing, and that probably influences the ones I choose.

"For instance, if you look at some of the rooms in The Guild of Thieves, you'll see that the architectural styles tend to preoccupy me most. I find that interesting to do, and obviously I'd probably also choose anything with dramatic potential as well.

"I tend to do lots of little sketches first, mostly in pencil, just to work out ideas, check out perspectives and so on. Occasionally I will also go into quite fine detail in a sketch to enable me to see how things will look.

"I can make suggestions to the adventure and change things around a little – if I felt it would be better to make a room a different size or shape, for instance.

"When I finally move on to the ST I use Neo, which I find quite adequate for my needs. I did look at Degas, but it didn't seem to have any advantages as far as I was concerned. There were a few little extras, but they seemed to be things I'd

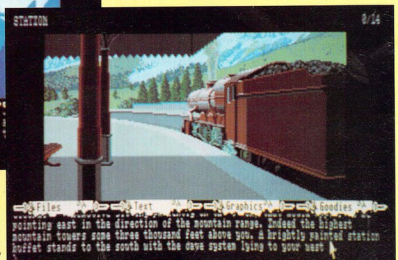
On the platform with the rain weatherman

maybe use once a year at the most, so it didn't seem worth switching.

"I use a lot of soft colours, for pastel-like effects, and that's because one of the problems I find in illustrating things is with the colours. Bright colours seem to me to be too bright. They almost leap out of the screen at you and that makes it difficult to maintain a balanced picture, so I generally tend to prefer the more subdued look.

"I did eventually think my graphics for The Pawn were better than most other stuff around at the time. It seemed obvious to me there were very few people

A gothic castle fills this peaceful mountain scene



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◁ doing computer graphics who knew very much about the art side of things, about colour and perspective and so on.

"They were basically mostly programmers who were called upon to do graphics, some better than others, but the general standard wasn't all that high.

"It was partly like that because of the limitations of the machines around at that time of course, like the Commodore 64 and the Spectrum. There's only so much you can get out of those machines and so people's expectations are lower.

"I was originally working on the 64 and it changed my style of working because of the need to get as much information as possible in the smallest possible memory space. With a machine like the ST the available memory goes up and you can concentrate more on the picture.

"I still find the ST restricting, though, in that you can only have 16 colours. If you've come from a home computer background then it probably seems a lot, much more and more varied than you've had before.

But if you've come from an art background where you're used to working with an infinite number of colours then you think, 'How can I work with only 16?' Especially because you've also got to get all the shades and so on out of those 16, which is difficult".

Eerie shadows fill the witches chamber

Despite the restrictions, Geoff Quilley has been able to produce what many people regard as some of the best graphics ever seen on the Atari ST. With Jinxter now finally out of the way, I asked him what he's working on at the moment.

"I'm taking a break after Jinxter, which was pretty hard work, and I've got nothing else planned ... other than going up to London later this week to see Magnetic Scrolls and find out about the next game, so I can start thinking about that."

In fact the game Geoff will be working on is the one after the one after Jinxter. "Our next game", Anita told me, "is codenamed Assassins, but it won't be called that when it's released as there's already a game with that title.

"It's about a commodity broker for whom everything goes wrong – this was written before the recent stock market crash. It could have been artistically rather dull, so we've contracted one artist specifically for that because of his very striking style.

"He did some of the more eye-catching scenes in Jinxter, such as the Witch's Chamber. When people eventually get there, they'll see what I mean. Geoff's going to be working on the one after that, codenamed Fish."

Fish? "Fish. That's all I can say about it, except of course that the graphics will be brilliant because Geoff will be doing them. He's our top artist, but they all have to be good and we will only use the best possible people. Our reputation for graphics is now very high, and we obviously intend to keep it that way".

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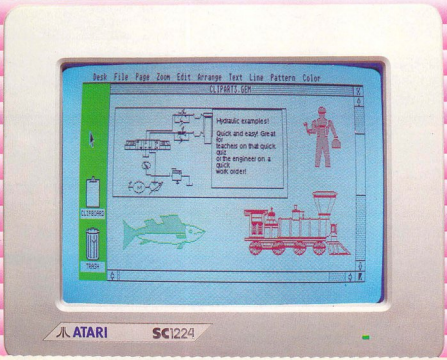

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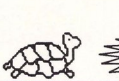

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Thanks for the memory

Richard Phillips shows how you can add an extra 512k of ram

NO one could accuse the Atari 520STs of being short of memory – for most purposes, half a megabyte seems more than enough. However, if you need a large ram disc and a print spooler or want to use Kuma's K-Switch to run two applications at once that massive memory quickly gets eaten away.

By way of a solution, we present a step-by-step upgrade to increase the memory of a 520ST to one megabyte, in line with a 1040STF.

The ST's memory is organised into two banks, each of which may contain either 128k, 512k or 2Mb, each bank consisting of a high byte and a low byte and organised across 16 chips. In the unexpanded 520 only bank zero is used.

While later STs like the 520STFM have space for extra ram, early models do not, and require special techniques to add the extra components. This upgrade will deal with all current models of the 520ST. Owners of 520STFMs can breath a sigh of relief, for their upgrade is by far the simplest.

To add extra ram to a 520ST or 520STM it is necessary to build bank one on top of the original ram chips using a technique known as piggybacking. The 16 new ram chips are soldered directly on top of the original chips.

Each chip has 16 pins, of which 14 will be soldered to the chip on the PCB. The remaining two will be connected to signals from the Atari's MMU (memory management unit).

The extra signals needed to make the ram work are the RAS (row address strobe) and the two CAS (column address strobes). These signals are tapped from MMU via three 47 ohm resistors to the new ram chips.

Three signals are required because each bank of memory is made of a high and low byte. The two CAS signals are present – one for each byte. The RAS signal is common to all of the new chips.

It is vital to read and familiarise yourself with all of these instructions before attempting the upgrade.

Step I: All models

Switch off your computer, remove the power connector and all other leads. Never attempt to work inside the casing with the power connected. Turn the computer over and remove the six fixing screws. 520STFMs have 10 screws in all, three of which hold the disc drive.

Once the screws have been removed, turn your computer the right way up and carefully remove the top half of the case. Lift off the keyboard so the plastic connector joining it to the main PCB is visible. With a pair of pliers gently remove the connector from the PCB, and remove the keyboard.

520STFM owners only: Remove the two screws and power supply lid. Remove the two screws from the end of the disc drive. Pull off the drive's ribbon cable and its power connector. Now remove the disc drive completely. Unscrew and remove the power supply completely. This is quite a tight fit and will require some gentle manoeuvring to get it out.

With a pair of pliers, gently straighten out each tab holding the PCB shielding. Remove the three screws at the front of the shielding and remove it completely. Undo the three screws visible at the back of the PCB and carefully remove it, holding it so that it does not bend and deform.

If you have a 520ST or 520STM go to step III.

Step II: 520STFM owners only

The siting of the ram on the very latest models has moved to underneath the power supply. Such machines can be identified by their file date stamping mechanism and internal clock which default to 1987 rather than 1985.

Turn the PCB over on an earthed bench. Early machines: Using a de-soldering pump, clear out the holes for the second bank of ram and the capacitor holes between them. This will be 280 holes in total.

Latest machines: Using a desoldering pump, clear out the holes for the second bank of ram. This is arranged in two rows of eight. Now clear out the holes for the 16 decoupling capacitors, located at the end of the ram locations.

Clear out the holes for the three silk screened resistor positions R71, R72 and R73. Fit the three, 33 ohm resistors and solder into place. Fit the 16 sockets to the board ensuring that the notch in the socket aligns with the silk screen in the board and the existing ram bank.

Fit the 16 capacitors, these components are not polarised so their orientation is not important. Note that some early boards have a large capacitor occupying one hole. If this is the case, solder the small capacitor directly to the lead of the larger one.

Using side cutters, clip all leads close to the board, being careful not to damage any tracks. Turn the PCB right side up and insert the Drams. Make sure they are all the right way up and no pins become bent underneath. While handling these components observe the anti-static precautions (see panel).

Go to step III.

Step II: 520ST or 520STM owners

For boards with three labelled solder pads, as shown in Figure I, solder the three 47 ohm resistors in these positions. Remove the 16 capacitors between each of the ram chips on the PCB These chips have 16 pins and are arranged in a neat row. They'll probably be marked 41256 or similar.

This step is best performed by applying gentle heat to each pad in turn and removing the excess solder with a desoldering pump. Repeat for the other 15 capacitors.

The next stage is to piggyback the rams. Before attempting this operation take note of the anti-static handling ▷

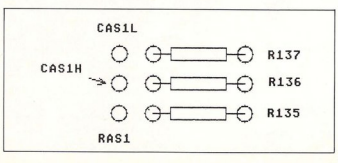

Figure I: Positioning of the three 47ohm resistors on some 520 STMs

◁ procedures outlined in the accompanying panel.

Before a ram chip is piggybacked, two of its pins must be bent outwards so that they are horizontal to the package and

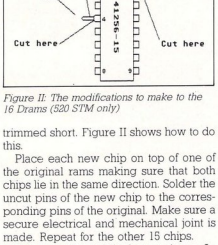

Figure II: The modifications to make to the 16 Drams (520 STM only)

trimmed short. Figure II shows how to do this.

Place each new chip on top of one of the original rams making sure that both chips lie in the same direction. Solder the uncut pins of the new chip to the corresponding pins of the original. Make sure a secure electrical and mechanical joint is made. Repeat for the other 15 chips.

Remount the original capacitors. As shown in Figure III, take a length of tinned copper wire ensuring that it is long enough to stretch over the top of the 16 ram chips. Solder one end of the wire to pin four of the leftmost chip.

Run the wire across the top of the chip and then solder it to pin four of the next chip – Repeat this for the remaining 14 chips. Once this has been done cut the wire to length.

The eight chips on the left hand side of the newly constructed bank of ram will be connected via pin 15, CAS1 low. Take a length of wire long enough to stretch across eight chips. Solder one end of the wire to pin 15 of the leftmost chip, then solder the wire at the appropriate points on the next seven ram chips.

Repeat the above for CAS1 high for the eight chips on the right hand side on the new bank of ram.

The next step is only necessary for STs without the three solder pads as shown in Figure I. Turn over the PCB and solder three insulated wires (about 15cm long) to the relevant pins on the memory management unit (MMU) as shown in Figure IV. The MMU may be socketed in U15. If you're not sure which chip the MMU is, trace some tracks to it from the ram chips on the PCB. Like GLUE, it will be a large QIL (quad in-line) package.

Take the three wires through a mounting hole in the PCB near the ram chips. Now solder one of the resistors to the end of each wire. Solder a length of insulated wire (about 10cm long) to the unsoldered end of each resistor. Make sure each connection is fully insulated with PCB lacquer – or electrical tape at a pinch.

The next step is only for STs with the solder pads, as shown in Figure I. Take

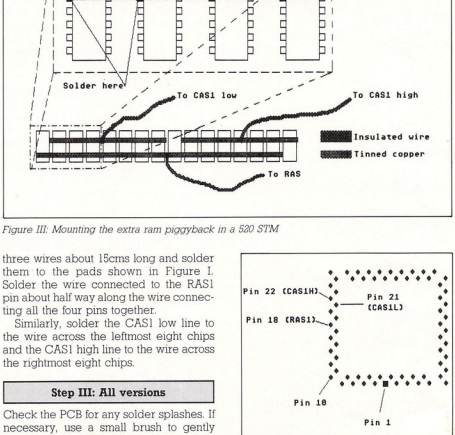

Figure III: Mounting the extra ram piggyback in a 520 STM

three wires about 15cms long and solder them to the pads shown in Figure I. Solder the wire connected to the RAS1 pin about half way along the wire connecting all the four pins together.

Similarly, solder the CAS1 low line to the wire across the leftmost eight chips and the CAS1 high line to the wire across the rightmost eight chips.

Step III: All versions

Check the PCB for any solder splashes. If necessary, use a small brush to gently remove them. Ensure there are no solder bridges between the protruding pins and tracks. Check once again just to make sure that everything has been done properly, then reassemble the computer in reverse order.

Switch on and boot a start-of-day disc. If everything appears normal you have probably completed the upgrade successfully. Now run the following ST Basic program:

```
10 DEF SEG=20
IF PEEK(&H424)=&H500 THEN PRINT "One
 Meg." ELSE PRINT "Half Meg."
```

If this program prints Half Meg, then upgrade has failed. This is because Tos automatically tests the presence and function of each bank of ram. If a single ram chip fails, Tos will refuse to reconfigure MMU to handle the extra memory and will configure itself for a normal 512k machine.

If this happens, check for dry joints,

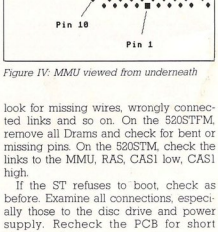

Figure IV: MMU viewed from underneath

look for missing wires, wrongly connected links and so on. On the 520STFM, remove all Drams and check for bent or missing pins. On the 520STM, check the links to the MMU, RAS, CAS1 low, CAS1 high.

If the ST refuses to boot, check as before. Examine all connections, especially those to the disc drive and power supply. Recheck the PCB for short circuits and retry.

If the machine still refuses to boot ▷

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NEWS...NE

Service has new specialist role

ONE of the country's leading learned societies has joined MicroLink.

The British Psychological Society has nearly 12,000 members and is involved with government, the health and education services, academic institutions and other organisations here and abroad.

Last year its charter was changed to allow it to maintain a register of chartered psychologists which the general public will soon be able to consult.

This gives the country a new breed of chartered specialists whose education and professional conduct the BPS oversees.

The society is no stranger to the benefits of electronic mail. For some time its members who work in academic institutions have been communicating via JANET, the Joint Academic Network.

By joining a more widely-used service like MicroLink, BPS members working in all areas of psychology can now communicate faster and more efficiently with the Society's offices in Leicester.

In addition the society's extensive business activities, which include publications and software, will be enhanced by MicroLink Email and telex facilities.

A bulletin board for business

MICROLINK has joined forces with the University College of Swansea to provide a unique electronic bulletin board for businesses.

Subscribers can get advice free of charge from experts in various fields, and discuss business problems with others who may have experienced similar difficulties.

As well as being instant and free, this access to professional expertise comes with no strings attached, no axe to grind and no commercial bias.

The wide range of business sectors covered includes legal matters, exporting, industrial relations, management, market research, personnel and training, statistical and systems analysis.

Expertise is also supplied in the areas of computing and computer systems, electrical and electronic engineering, expert systems and artificial intelligence, and mechanical engineering.

Users of the Business Bulletin Board can browse through the messages and replies for items of interest.

All messages are read by the system operators who pass them on to the relevant expert.

Translation back the same day

LANGUAGE expert and Swansea university lecturer Dr June Salmons has started what is probably the world's fastest translation service on MicroLink.

Subscribers who send foreign language documents to her mailbox can get the translated material back the same day – a vast improvement over the post, particularly for businesses.

"Initially I can offer translation facilities in Italian, Spanish and French – but if the demand is there, other European languages can easily be added", said Dr Salmons.

Subscribers can use either the standard service, where the translated document is returned via MicroLink the next day, or the super-fast same day service.

Dr Salmons, a lecturer in Italian, said: "Europe has always been an important area for organisations to develop into. However, barriers are often erected solely because of linguistic difficulties.

"Hopefully, a fast and efficient service like this should make it easier for more firms to enter Europe".

Big cash savings

THE first commercial bulletin board on MicroLink has been launched.

Called LoadLink, it will help Britain's 2,000 removals firms avoid expensive wasted space on their vehicles.

The service provides information about spare capacity – part-loads – available throughout Britain and abroad.

Firms using LoadLink can sell or buy space on part-loaded vehicles, enabling journeys to become more efficient and profitable.

It also enables firms to give their customers better service by accepting small loads that were previously uneconomic.

◁ remove all Drams. If the machine now works correctly it is most probable one or more of the Drams has been damaged by static. In this case the chips will have to be returned to the supplier for testing.

DRAMS AND STATIC ELECTRICITY

The memory chips used in this upgrade belong to a family of devices known as the N-type metal oxide semiconductors (Nmos). By their nature, Nmos integrated circuits are extremely sensitive to the static charges generated by the human body.

While handling these delicate and expensive components it is advisable to wear an earthed wrist strap (see parts list) and avoid touching their pins whenever possible. All chips should be left in their anti-static foam until required.

A low leakage (less than 3μA at tip) soldering iron is beneficial if you need to solder directly to the ic's pins.

PARTS REQUIRED

16, 256k bit Drams – 150nS access or better.
3, 47 ohm high stability resistors.
2 metres of tinned copper wire.
1 metre of insulated wire.
2 metres of 22swg resin-cored solder.
Low power, low leakage soldering iron with a small tip.
Anti-static wrist strap.
Medium Phillips screwdriver.
Side cutters.
Long nose pliers.
Desoldering pump.
In addition, for the 520STFM
16, 0μ1 tantalum capacitors.
16, low profile DIL sockets.
3, 33 ohm 1/4 watt resistors

All are available in kit form priced £50. Tools and a fitting service are available separately. Further details from:

Paul Rossiter Electronics.
48 Park Drive,
Hucknall,
Notts.
NG15 7LU.
Tel: 0602 631631

CAUTION

This upgrade requires a considerable amount of delicate soldering and a reasonable knowledge of electronics.

Mistakes could cause irreparable damage to the computer's internals. Do not attempt this unless you are confident of your abilities. Furthermore, opening your computer's case will invalidate its guarantee.

It is essential to ensure the mains supply is switched off and disconnected before attempting the upgrade.

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ADVENTURES

Not so elementary with Holmes and Watson

Brillig lends a hand in solving problems for fantasy fans

IT seems like only yesterday that I was saying that Infocom was producing adventures like there was no tomorrow. Privately, I doubted if this pace could be kept up but then, as if to prove that old Brillig is as fallible as any other adventurer, news arrived of not one, but two new releases from that famous company.

The first is called Border Zone in which you play the separate roles of a trio of interlinked characters in a fast-moving tale of international espionage and intrigue. The Iron Curtain, separating East from West, is a notably dangerous border, yet it is across this perilous frontier that you will have to go, not once, but three times.

The adventure starts on a train just outside the Iron Curtain. Unknown to you, a plot is afoot to destabilise a nearby neutral territory by assassinating the American ambassador there. Racing towards the border is a train aboard which are a headstrong American spy, a dreaded KGB agent and a happy-go-lucky businessman. All three are soon to become enmeshed in the assassination plot, their lives intertwining as each carries out his own hazardous assignment in a real time race against the clock.

The adventure is seen from three different viewpoints (the character's) and each is a complete story in its own right. Timing is crucial to your success as you seek to evade a vicious pack of search dogs, outwit the KGB, launch a desperate assault on the border and count down the seconds to the planned assassination.

For the first time in an Infocom adventure, on-screen hints are provided to help you on your way. Border Zone sounds really exciting – watch out for a full review in these pages soon.

The second release is entitled Sherlock: The Riddle Of The Crown Jewels. No prizes for guessing which famous sleuth appears in this one. However, there is a surprise in store – you play the part of Dr Watson, not Holmes.

The pre-release blurb says that although you can confer with Holmes, the solution to the crime is in Watson's hands. Now in those classic tales of mystery and detection from the pen of Sir Arthur Conan Doyle, the good Doctor always struck me as being a bit of a thickie:

"Lord Dimwit Flathead did not commit suicide, he was murdered."

"Good grief, Holmes, how can you tell?"

"Elementary, my dear Watson. As you can see, he has been shot 20 times with a bazooka, there is a dagger protruding from his back and both arms have been completely severed at the elbow!".

Unless Watson has taken to a fish diet and undergone a crash course in basic detection skills, I can't help wondering just how you'll ever manage to complete this adventure.

The Crown Jewels have been purloined from the Tower and Queen Victoria's Jubilee celebrations are but two days away. As Watson, you must pit your wits against the villain who has left a trail of infuriating riddles to help you solve the crime. Sounds like game, set and match to the thief to me.

This adventure also features on-screen hints and – Infocom really is ringing the changes lately – sound effects. Let's hope violin playing is not included. Keep your deer-stalker at the ready and your magnifying glass trained on these pages for an in-depth review in the near future.

And so, on to the latest crop of readers' letters. A big thank-you to William Downie of Inverurie for his Christmas card and the gift of a furry house to keep my ST mouse warm. William has also sent in a map of Planetfall together with a picture of Floyd which may well have been drawn by William's sister, but has definitely not been modelled by Toodles the cat (see *Atari ST User* December 1987).

Neil Sutherland of Renfrew is a newcomer to adventures and is struggling with The Pawn. He has asked if I could possibly send him a complete solution. Well, I'm sorry Neil and other readers who have written in asking for full solutions to this and various adventures, but I'm afraid I'll have to disappoint you – it would spoil the game wouldn't it?

But so you won't feel too downhearted, I am, starting with this isssue, going to publish a reasonably complete run-down on The Pawn. It won't contain every detail so you'll still need to exercise your own brain power to some extent, although I hope that the published trail helps you with most of the problems. Exciting adventuring!

HINTS AND TIPS

THE PAWN

Look at your clothes. Go East. Say to Kronos "Greetings". Take note and ask Kronos about the wristband. Take the chest. Go to the palace gardens and look for a key. Look in the fountain. Go to the shed and look for a rake, hoe, trowel and pot. Show something to the guards. Go to the Guru.

Cover the wristband and go to the large boulder. Tie the rake and hoe together with your shirt. Lever the boulder with the rake and hoe. Climb the rocks. When he appears, give the chest to the adventurer. Get on the horse. Get some snow. Return to the Guru.

Go to the clearing and look at the stump. Mix the items. Go to the large tree. Unlock the door, enter and close it. Lift boards and go down the stairs.

Program: Land of the Lounge Lizards
Price: £19.99
Supplier: Sierra/Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

Naughty, but quite nice

THOSE with an easily shockable disposition, beware this text and graphics adventure. Leisure Suit Larry in the Land of the Lounge Lizards is a naughty, but humorous romp aimed squarely at the adult population.

It contains much material that is unsuitable for children and for any who are offended by risque references to sex, bodily functions and other matters more usually found in a late-night TV show, than in a computer game.

Lounge Lizard is presented in Sierra's familiar 3D style in which you control the directional movements of an on-screen animated character by mouse or keyboard, and all other actions by text input.

Those who have played any of the King's Quest series will know exactly what I mean. An area at the bottom of the screen is reserved for the player's text input while the game's responses appear as overlays on the picture.

The difference with this game though is that the term 3D has an additional meaning – Dancing, Dames and Drinking. Leisure Suit Larry, the star of this adventure, is 40 years old and single – a would-be swinger who is out on the town and looking for the girl of his dreams.

Although Larry thinks he's just the sort of macho man that chicks have been waiting all their life to meet, the reality is something else. Larry is in fact the original nerd, a jerk of the first water, a king klutz.

Decked out in his knock-'em-dead suit (permanent-press, 100 per cent polyester) and gold chains, Larry is a blind date's nightmare. His line in patter went out with the ark and his halitosis needs constant attention from his spray of breath-freshener.

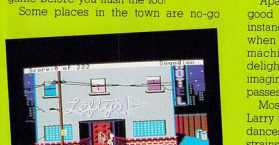
In order to safeguard against children playing the game, Sierra has devised a short test to prove that the player is of adult age. At the start of every session, you have to correctly answer five randomly chosen, multiple-choice questions. Make two mistakes and the program deems you to be a child and kicks you out by returning you to the Desktop.

The trouble is, while some of the questions are there just for laughs, many are directly concerned with American history and culture. Would you know who Mr Greenjeans was or who Calvin Klein is married to? I didn't and as a result of my ignorance on these and quite a few other topics, it often took several reloadings before I even began to play the game – and I'm no spring chicken!

Lounge Lizards commences with Larry standing on the pavement outside Lefty's Bar. If our hero hangs about too long, a mangy black dog toddles up and waters Larry's leg, thus letting you know that this game was not written by William Shakespeare and thereby setting the comically low tone for things to come.

Inside Lefty's, Larry can chat up the customers, buy a drink, play the juke box or generally explore and mess about. It's worthwhile examining everything in sight for much of the fun of the game is to be derived from such actions. The rest room at the back of the bar affords the program plentiful opportunities for lavatorial humour. A word of warning – save the game before you flush the loo!

Some places in the town are no-go



areas. If Larry vists them, he ends up getting mugged and, a neat innovation this, getting carted off to Sierra's factory where adventurers are recycled and returned to the action.

Among the night spots Larry can visit are the disco and casino, which he can reach by taking a cab ride. A bouncer guards the disco entrance and Larry will not be admitted unless he comes up with a membership card. But once inside, he'll have every opportunity to chat up and dance with the solitary chick he'll find there.

A nearby all-night store offers a rack of dubious magazines and the chance to buy some of those items that most men used to buy from the barbers, but these days are even advertised on TV. The purchase of one of the latter objects leads to a Woody Allen-like embarrasing denouement in the store.

At the casino-cum-hotel, Larry can gamble on the slot machines or play blackjack, or he may prefer to visit any of the other seven hotel floors via the glass elevator. The greenery decorating the foyer is Larry's favourite – polyvinyl chloride.

A cabaret within the casino offers, for Larry's entertainment, a stand-up comic who has what appears to be an inexhaustible fund of blue jokes, some of which would make Bernard Manning blush. The punch line of each of the gags is aptly marked by a quick burst on the drums by the lone musician, followed by a desperate appeal for clemency by the comic.

Just beside the casino is the Quick-Wed marriage office which may entice Larry to splice the knot, assuming he can find anyone to splice it with.

Apart from Larry, animation is used to good comic effect in many places. For instance, the juke box starts bouncing when played, a lady playing the slot machines jiggles up and down with delight on winning and I'll leave you to imagine what a flasher does when Larry passes directly in front of him!

Most notable of these effects is when Larry takes the floor with his partner and dances to flashing disco lights and the strains of "Stayin' Alive". Hilarious.

There are 222 points to be earned and these are scored not just for solving puzzles like finding a disco membership card, but for other actions not central to the plot, such as taking part in a hot-line sex survey. Games can be saved and reloaded and the speed with which Larry moves around can be adjusted to suit your taste.

If it's silly or smutty, chances are you'll find it in this program. The game has a vocabulary of over 900 words including many of the four-letter Anglo-Saxon variety.

Although the program is risqué, certainly at a stronger level than the "Carry On" type of humour, Leisure Suit Larry in the Land of the Lounge Lizards is nonetheless harmless enough stuff for adults. If you like your humour to be bawdy and barmy, this is the one to go for. But unless her name is Joan Rivers, don't give it to your granny to play.

Brillig

Presentation	***8***
Atmosphere	***9***
Puzzlement	***7***
Value for money	***8***
Overall	***8***

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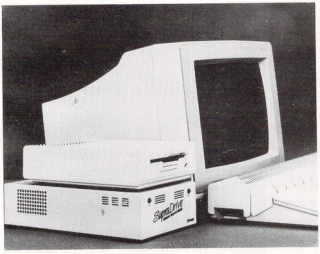

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Speedy and flexible

Julia Battle tries out Tempus – a super-fast text editor utility

THERE are many excellent text editors on the market, and even some good public domain ones like 1st Word. All programming languages such as C and Pascal and developement systems are supplied with a text editor. So what has Tempus, yet another one, got to offer that the others haven't?

Even after using Tempus for only a short while it became clear that it was no ordinary program. It looks like Gem, feels like Gem and appears to work like Gem, but it simply can't be – it's so incredibly fast. The scrolling has to be seen to be believed.

The manual reveals the story behind this amazing program. Tempus took a year to write and was essentially thought of as a programming exercise. The programmers wanted to prove that software written to run under Gem need not be the slow, cumbersome beasts that we are all used to.

The main problem is that Gem, and programs written under it, are developed in C and compiled to machine code. Athough many people claim that C compilers produce fairly compact and efficient machine code – and perhaps they do – for speed they can't rival a pure machine code program written in assembly language.

This is shown quite clearly by Tempus, which is written entirely in machine code – including all the Gem routines.

The panel here shows the time taken by Tempus, Assempro, 1st Word and Devpac text editors to scroll through a 500 line file. Tempus takes less a quarter of the time taken by any of the others. Devpac is particularly poor – 110 seconds compared with Tempus' 20. That should give you an idea of the speed difference.

Time to scroll through 500 lines:	
Tempus	20 sec
Assempro	80 sec
1st Word	88 sec
Devpac	110 sec

The authors admit it was hard work developing Tempus and that the exercise was not really economical. We shouldn't expect software of this standard all the time. This is a disappointment as it is such an exciting product I'd like to see more software written to this standard.

Tempus is a very compact program, taking little space on the disc. After installing it, it can be freely copied and placed on your work discs – if you don't install it you'll simply end up with a demonstration copy which will not save text.

It will run on any ST in medium resolution colour or high resolution monochrome and will use all the available ram for the text. This means you can have extremely large files in memory.

Figure I shows the editing screen with two files open – B:\INFO\A-README.TXT in the top window and B:\PRINT.S in the lower one. Up to four files can be open at once.

Notice that two different fonts are in use – the built-in rom font in the top window in 8 x 8 pixel mode and a fancy 8 x 16 font in the lower one. Tempus will happily load and use Degas format fonts and the one shown is supplied on the disc.

Figure I also shows the elapsed time in the top right corner of the screen – not so useful – and function keys at the bottom – more useful. You can set up the function keys so that on pressing Shift or Alternate plus a key a predefined string will be inserted into the text.

Lines of text can be set up to 255 characters long. When loading a file each line is checked and any that exceed the maximum have to be changed. Here you have the choice of automatically chopping off the excess or wrapping it round to the next line.

All normal Ascii characters can be entered at the keyboard, while characters outside the normal printable range can be entered by calling up a complete character set table. A character can then be entered at the current cursor position by pointing at it and clicking the mouse.

An integer only, Reverse Polish Notation (RPN) calculator is constantly available from one of the pull-down menus. This works in a similar manner to the way Forth handles its maths. It's very useful, but may be confusing if you haven't come across RPN before.

In addition to the normal addition, subtraction, multiplication and division operations, it will also convert between the common number bases decimal, hexadecimal, binary and octal.

The search and replace facilities are most impressive. Up to 20 separate strings can be defined – you can then search for any of these and replace them with any of 20 others. A single wildcard representing one character can be used or a multiple wildcard representing several characters is acceptable.

The search can be forwards, backwards, from the start of text or current cursor position and case sensitive or insensitive. You can search and replace ▷

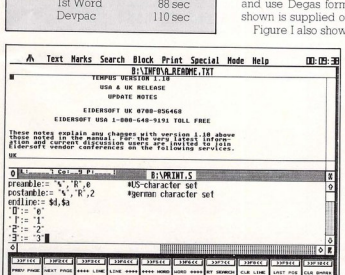


Figure I: The editing screen with two documents open

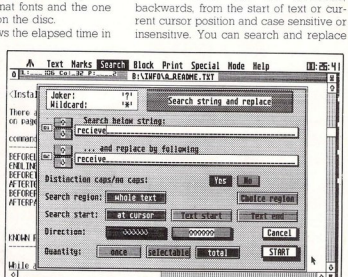
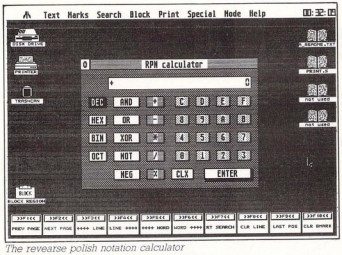
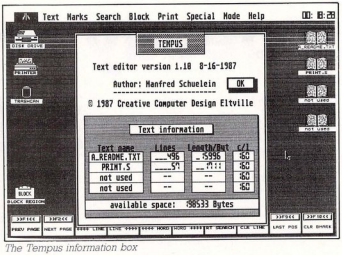


Figure II: The search and replace dialog box



The revearse polish notation calculator



The Tempus information box

◁ the first occurrence of the search string or all, or ask for confirmation each time. Also, the search can be restricted to a defined block of text. Figure II shows the search and replace dialog box.

A block of text can easily be defined and thus highlighted on-screen. It can be moved, copied, deleted, cleared and saved. You can also jump to the start or end of a block.

The manual, with more than 80 pages, is a superb piece of work and is an example for all others to follow. Every topic, menu item and function is clearly explained and there are many screen dumps illustrating the text.

Tempus must be considered to be the ultimate text editor and is a model for all other software producers. The programmers have shown that Gem programs can be fast, powerful and flexible and I hope this will go a long way in encouraging other software companies to produce equally impressive products.

Product: Tempus
Price: £34.95
Supplier: Eidersoft Software, Unit 4 Stannets Laindon North Trade Centre, Basildon, Essex SS15 6DJ.
Tel: 0708 856468

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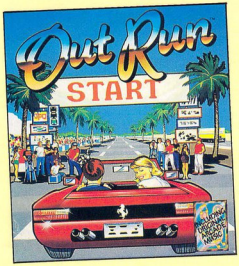
Going for Gold

SINCE its formation around five years ago, US Gold has had tremendous success. It shares its modern, open-plan Birmingham offices with two other companies – Centresoft and Gremlin. There's also a huge warehouse piled high with software, packaging and point-of-sale material, and in reception there is an impressive display of awards, including gold discs and cassettes.

From small beginnings, US Gold has grown into a concern with more than 120 employees. It has released in excess of 250 full-priced and more than 80 budget titles. Whenever the company brings out a new title it tries to cover as many formats as possible, including Amiga,



Outrun: *This is the conversion of Sega's coin-op hit and the ultimate experience in motor sport simulations. You race against time through a variety of landscapes including Death Valley, Desolation Hill, Cloudy Mountain and a host of other locations in a fast sports car accompanied by an attractive blonde.*

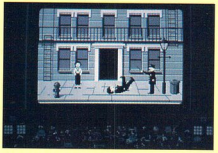
The landscapes are very realistic and the car handles much like the original arcade machine.

Apple, Atari 8 bit and ST, BBC, Commodore 16/64/128, IBM, MSX and Spectrum 48/128.

In 1986 US Gold spent nearly one million pounds on advertising and business grew by more than 50 per cent. The company was ranked as the 17th largest in the UK computer market with annual sales of £4.5 million.

On a recent visit to US Gold Robin Nixon found a whole host of games due to be released later this year

Since then things have gone from strength to strength, with the company



Charlie Chaplin: *Here you become a movie director who has to produce an epic film starring Charlie Chaplin. In each game you have a choice of scripts, backdrops and props.*

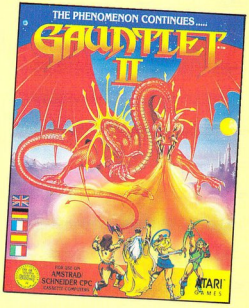
Once you've selected these you then control Charlie in a fast-moving arcade game avoiding capture by the baddie. Scenes can be recorded or reshot and then saved to be screened later – in front of your admiring fans.

now having offices in Japan, America and most European countries. A recently signed agreement with arcade giant Capcom should bring revenue of £2 million by 1989, and the company has also obtained the rights to market Rainbow Arts products throughout the UK and Europe.

Last September saw the launch of the GO! label with the intention of it becoming the UK's leading software developer and acting as the international sales arm for the US Gold group. GO! is now well established and marketing manager Richard Tidsall gave me a preview of some of the programs you'll be seeing soon on this and other US Gold labels – see the accompanying panels.

After briefing me on the games, Richard introduced me to Jerry Howells – the project manager for USA-based SSI which does contract work for US Gold. When SSI started out most of its software was written for Apple computers, so this is always kept in mind and software is quite often originated on an Apple.

SSI is now looking at the possibility of using 16 bit micros because of their extra speed and power, but they will continue to produce programs on most formats.



Gauntlet II: *This is the long-awaited and exciting sequel to the top-selling Gauntlet. As in the original game, you take the part of an adventurer – you have a choice of four different characters each with their own strengths and weaknesses. Battle your way through countless dungeons, slaying all in your way, in order to survive.*

US Gold has been working on many other programs and we'll be reviewing them (as well as those mentioned here) as soon as they become available.

With all these products ready for launch, the deal with Capcom and the appeal of the GO! label, US Gold is certain to continue through 1988 as one of the UK's top software producers.

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Free-for-all

William Hern tries some public domain disc utility programs

THE public domain offers a great resource for software. Though often of a high standard, it would not sell in quantities large enough to be marketed by a software house.

Nowhere is this more true than with utility software. Very little is commercially available, but there's a great wealth in the public domain. There is some outstanding floppy disc utility software broadly covering both disc maintenance and management. I would recommend all ST users track down copies of these great programs from the public domain libraries listed at the end of this article.

Every ST owner should have a file recover program to avert disaster when a file is accidentally erased or a disc damaged. There is none better than DL II written by the Swiss programmer Simon Poole, who was also responsible for the excellent comms program Uniterm.

Although the version I have is an early one (V0.24) with a couple of minor bugs and incomplete documentation, I was still immensely impressed by the number and range of its features.

You can view and edit disc sectors, see which tracks have been written on, recover deleted files as long as they have not been overwritten and lock out damaged sectors. This means that a damaged disc can be used again, although it will have less storage on it.

One of the most impressive features is a separate program called Reorg which will reorganise a disc's files so that all the sectors occupied by a program are stored consecutively on the disc.

Normal disc usage means files become fragmented all over the disc, so the drive head has to spend valuable time searching for the next sector. The Reorg program can speed up disc access by as much as 25 per cent. It complements DL II well to form a package which is as good as any commercial effort.

One of the annoying problems with the ST is that it can only autoload Tos programs at bootup, which is inconvenient to say the least with most ST software taking advantage of Gem. However, the desk accessory Loadupm allows Gem programs to autoload and does much more as well.

The name of the program to be loaded is placed in the DESKTOP.INF file, and as long as Loadupm is on the same disc the Gem program will be loaded at bootup. Loadupm is also of use during a work session. In the top right-hand corner of the screen it prints the memory free and also the time and date.

It can also go into idle mode, where the screen is blanked off with a picture of an ST plus monitor flashing randomly around the screen. This will save screen phosphor wear, but will remind you that the monitor and computer are still on. Loadupm is a useful program which does the jobs of about four desktop accessories and is therefore very economical on memory.

When you consider that the Macintosh gets 400k from a single sided disc and an Amiga 440k, the ST's 360k seems meagre. Numerous programs will format quicker and give more disc space than the standard Gem desktop function. One of the best of these is Disco. Although it is a German desk accessory, even I had no trouble understanding it with my non-existent German.

The program allows the disc to be formatted to 360 and even 420k per side although 420k is not very reliable and is not recommended. Since it is a desk accessory, there is no swapping of discs to load the formatting program, adding to its convenience.

To pack even more programs on to your disc, you can use a file compressor which squeezes files so they take up less space. They will however, need to be decompressed before they can be accessed again, so the utility is best used with backup copies of important files which are seldom used.

The best program of this ilk I know of is called Arc, short for Archive. It employs various compression techniques, so all types of file, programs, documents, pictures and so on are compressed efficiently. Generally I was able to obtain a 40-50 per cent size reduction.

Files can be added to or deleted from a compressed Arc file, and extraction of all or a particular set of files is equally easy. There is even an encrypt/decrypt feature, so you can keep your valuable files from prying eyes. The program now has a shell companion called, unsurprisingly, Arcshell, which makes Arc much easier to use.

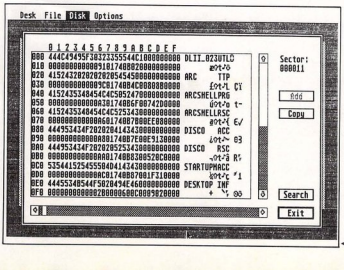
I hope this article has whetted your appetite for some of these programs which I feel are essential to good ST computing. Once you start using them, I think you will too.

PUBLIC DOMAIN LIBRARIES

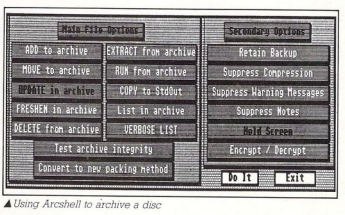
McSoft, 9 Abingdon Gardens, Bath, Avon, BA2 2UY.

The Southwest Software Library, 5 Barn Owl Way, Stoke Gifford, Bristol, BS12 6RZ.

The ST Club, PO Box 20, Hertford SG13 8NN.



◀ *Using DLII to edit a disc*



▲ *Using Arcshell to archive a disc*

Thing on a spring

Product: Frost Byte
Price: £14.95
Supplier: Tynesoft, Addison Industrial Estate, Blaydon, Tyne and Wear NE21 4TE.
Tel: 091-414 4611

DEEP beneath the frozen surface of the planet Cosmia, helpless Kreezers are being captured and eaten alive by fierce ice monsters. By sheer chance one Kreezer – you – manages to escape from his cage and for him the adventure has just begun.

To complete the game you must locate and release five fellow Kreezers – each one is trapped on a separate level of the ice cavern. Kreezers are odd little critters.

Shaped like square-ended caterpillars, they move around by turning end over end. Older readers may remember a toy called a Slinky, a large coiled spring that walked down stairs. A Kreezer moves in exactly the same way.

Operating under joystick control, Hickey the Kreezer can move left, right or jump. He can also use a variety of objects to be found in the caverns.

One crafty little manoeuvre you're not told about is his ability to walk on air – jump high and move the joystick to the left or right and Hickey will move in the appropriate direction as though he were walking down stairs. Mastery of this trick is essential if you intend getting further than screen two.

Being of low intelligence, the ice monsters have left a stock of bullets right next to Hickey's cage. These may be fired by bending Hickey in the correct direction and pressing the fire button. Bullets are effective against some, but not all monsters – many of the beasts must be avoided by using carefully timed leaps.

For some sections of the game your already impressive athletic abilities need a bit of a boost. This is where the diamonds dotted around the game become useful. These are actually sweets that comes in three different flavours: Red ones boost your speed, blue increase your jumping ability and green ones enable you to fall further without suffering fatal consequences.

The ice monster's mattresses may also be used as an aid to jumping – or soft landings. These are to be found at regular intervals throughout the caverns.

The game is played against a very strict time limit – you have to free each incarcerated Kreezer before the time limit expires. Fail and you lose the game, irrespective of the lives you have left.

Many moons ago I saw the Amstrad version of Frost Byte. At the time I was impressed by the size and colour of the sprites, but unfortunately the animation was not too good. I am pleased to say the ST graphics are bigger and brighter than ever and the animation is faultless.

Frost Byte is a very deceptive arcade/adventure game. The size of the sprites

ensures the layout of each screen is relatively simple, yet the margin for error when timing jumps is practically nil. A classy game at a bargain price.

Jon Revis

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

Alternative Olympics

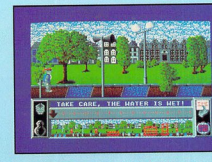
Product: Bad Cat
Price: £19.99
Supplier: US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388

THE year is 1984, the city Los Angeles. All eyes are focussed upon the Olympic Games so nobody notices the alternative event – the feline Olympiad, organised by the alley cats on the bad side of town. Bad Cat is the favourite, but with you in control of him, anything can happen.

The competition consists of four main events, with a bonus interlude between each. The scoring system is quite complex – points are awarded for the completion of an event, but as this is such a rare occurrence you will probably gain most points by drawing applause from the spectators. The inclusion of real cheers and applause is an excellent idea, spurring you on to greater things.

Event one is a stroll in the park. The first few screens involve simple jumps across water and over walls. However, these soon develop into fiendish combinations of walls, trampolines, swings and climbing frames. Thankfully Bad Cat is not limited to the usual nine lives, and is quite capable of dying many times before the time limit expires.

The interlude is a useful way of boosting your score. Moving around a map of the city are three squares (police cars) and a cross (Bad Cat). Simply guide Bad Cat to a flashing red dot to begin the next event.



Thousands of additional points may be notched up by collecting beach balls en route, but these points will only be added to your score if you reach the dot before the time limit is up. It is very easy to go for one more ball and lose everything.

Event two would not look out of place on It's a Knockout. There are two islands floating to and fro in a swimming pool – standing on one of them is Bad Cat. Above is a series of moving shapes.

All you have to do is jump high in the air, collect a shape, and land on the second island. Miss it and you get wet, almost miss, and Bad Cat falls to his knees laughing wildly and thumping the ground.

The third event is original, colourful – and held underground in the sewer. Bad Cat must avoid falling blocks and floods from the storm drains, walk barrels on the water, and Kung Fu a pack of rats. This is all accompanied by the sampled sound of rushing water – superb fun, but extremely difficult.

The final event is a duel between Bad Cat and a mean-looking bulldog. Standing at either end of a bowling alley, they launch balls at each other.

Each time you are hit, you have to walk to the bar and drink a pint of beer – and the more you drink, the less coordinated you become.

The graphics used are of a high standard, the events original and the sound is superb.

Steve Brook

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

Beaten into submission

Program: Micro League Wrestling
Price: £19.95
Supplier: MicroProse, 2 Market Place, Tetbury, Gloucestershire GL8 8DA.
Tel: 0666 54331

ALL Saturday afternoon armchair fans of the grapple and grunt sport of wrestling are likely to make a beeline for this new two-disc game from MicroProse. Micro League Wrestling is quite unusual in that it features heaps of digitised video action and comes as close to a TV simulation as you're probably ever going to see on your ST.

The game is also innovative in that it requires a strategic approach and does not rely at all on fast hand and eye coordination. Two matches are offered – Hulk

Hogan versus either Randy "Macho Man" Savage or Paul "Mr Wonderful" Orndorff.

The bout can be controlled by joystick, mouse or keyboard and by one player against the computer or two players against each other. You can even let the computer take over the whole contest and just sit back and watch.

The game is comprehensive and is cleverly centred around the use of a host of digitised black, brown and white stills. It commences with pre-match interviews with the two contestants by Mean Gene Okerlund and is followed by the announcer's introductions and the wrestlers' entrances before the match begins.

The progress of the bout is displayed in the top two-thirds of the screen. Above this is a digital readout of elapsed real time (bouts can be 10, 20 or 60 minutes long) while at each side is a list of the 11 available moves for each of the wrestlers.

Just below are respective damage and dominance meters under which is a panel showing two small digitised images of two commentators with their spoken comments displayed as text.

While the combatants are sizing each other up, the player must select a move for his wrestler from the list. There is no time limit and the game will not proceed until both wrestlers have decided upon their next manoeuvre.

Once they have made their choice the program shows the resulting action in a series of appropriate and fairly rapidly updated digitised stills, thus giving some illusion of movement.

The grappling sessions are punctuated by shots of the audience and remarks by the commentators after which the game awaits a further move from each player – and so it continues until one wrestler wins or time runs out.

The wrestlers do not have identical lists – each has his own set of speciality throws, kicks and holds. For instance, Hogan has an atom drop and head smash in his repertoire while Orndorff specialises in the eye rake and pile driver.

In addition to the lists, the players can enlist the audience to give them a temporary boost or even stoop to dirty tricks (for which they run the risk if being disqualified).

The use of digitised real-action images, even though they are a bit fuzzy in places, does give a realistic TV feel to the game. Sound is poor, consisting mainly of an introductory tune, a few slaps and a varying-volume hiss supposedly representing the audience's excited buzz. That's a pity because good sound effects would have really enhanced the game's otherwise excellent atmosphere.

I certainly liked being able to play a sports simulation without the pressure of having to instantly make a move or having to be highly skilful with a joystick.

However, this benefit is also the program's downfall. Because the urgency and coordination factors have been removed and because the strategy elements mostly boil down to luck in selection of moves, Micro League Wrestling failed to generate any excitement while I was playing it.

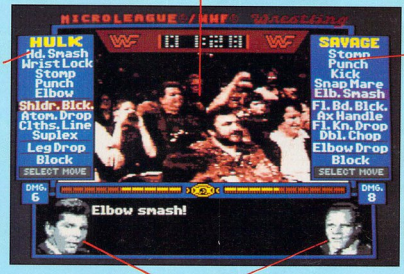
This simulation is an innovative game and deserves full marks for its fresh approach. However, it is also a game that you are unlikely to play more than a few times before consigning it to the back of the cupboard, perhaps bringing it out occasionally to show to friends and relatives as a novelty item.

But if you're an ardent wrestling fan, this is definitely the best of its type around.

Bob Chappell

Sound	***3***
Graphics	***7***
Playability	***7***
Value for money	***7***
Overall	***7***

The cheering crowd



Hulk Hogan's moves

Randy "Macho Man" Savage's moves

The commentators

Program: Tanglewood
Price: £19.95
Supplier: Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB
Tel: 0726 68020

The Tanglewood introductory screen

Complex graphic exploration

IT's difficult to find a neat label to describe this new release from Microdeal. Tanglewood is all graphics and played in real time, yet it is definitely not an arcade game.

Although it's all about exploration and the collection of items in order to solve puzzles, it can't really be called an adventure either, since the absence of any text input puts it outside the scope of what is usually understood by that term.

Whatever tag you want to attach to it, two things are for sure: This game is complex – and it's big. There's more than 700k of graphics included and of the total of almost 12,000 locations, you can visit more than 3,000. If that's not big, then what is?

Tanglewood is a small undistinguished planet in a remote galaxy on which your uncle bought up the mining rights, generally believed to be worthless. However, what were regarded as unremarkable stones transpired to be very rare – and valuable – dog crystals and ice emeralds.

The big boys have got to hear of this discovery and have set up their own operational base with a hastily assembled security system. Your uncle has appealed to you to come on over and take control of his five mining mobiles. Your task is to help him reap the harvest despite the predatory manoeuvres of the bad guys who have stolen the mining deeds and hidden them deep in their multi-floored headquarters on the planet.

You will also need to gain the trust and confidence of the local inhabitants if you are to succeed – and that means taking their strange initiation test.

The game is entirely mouse driven. The whole screen represents a console with the main part showing a view of the current scene which, in general, scrolls with the movement of your mobile.

Each mobile is started and halted by a press of the mouse button and steered by pushing the mouse in the appropriate direction. Control is a little awkward and it takes some practice before you are trundling around without too many unscheduled stops and starts.

Going underground

The opposition's control centre

Down the left hand side of the screen are five buttons, each of which is used to activate a particular mobile. Most of the mobiles can only travel along roads and paths, and one in particular can only move while it remains close to water. Being a little on the ancient side, they are all rather ropey – part of your task is to get them to cooperate with each other and to find various parts that will enable them to function better.

The mobiles themselves are imaginatively depicted and their movement is smooth and convincing – once you've learned how to keep them going.

The top and right hand sides of the screen are filled with various instruments and gadgets. Apart from a heat and energy gauge, though they are really only there for decoration and atmosphere.

Along the bottom of the screen are a number of switches which allow you to quit, save and reload games, toggle the sound on and off, and pause the action. A text area is used to display game prompts and messages output by the program.

There are six uncharted regions in which you will require special computer data to navigate, and there is an earthquake zone where unpredictable landslips are an ever-present peril. In addition, the baddies have sent out rival mobiles to add to the danger of your mission.

Visually, the game is a delight. The landscape consists of fields, gardens, roads, bridges, rivers, lakes, swamps and so on, all sharply depicted and attractively coloured. There is a huge variety of buildings and other constructions scattered around the landscape and underground travel is also possible.

There are plenty of tortuous mines, metallic mazes, rock-hewn labyrinths and stone-wall tunnels to lose your way in. And some puzzles can only be solved at night.

Tanglewood is very big and very complex so don't expect to unravel it in a few hours – or even days. However, the puzzles are not linear, so the game can be solved in many different ways, thus avoiding the frustrations of having to follow a set order.

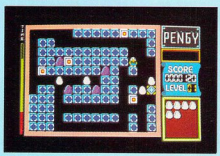
An unusual and beautifully presented game, Tanglewood should bring pleasure and puzzlement in abundant measure to all who play it.

Bob Chappell

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

Program: Pengy
Price: £14.95
Supplier: Red Rat, 11 Pennell Street, Manchester M4 3DU.
Tel: 061-835 1055

Old hat from Red Rat



DO you remember a game called Pengi? Or perhaps Percy Penguin, Pengo, Noc-A-Block or Rockfall? They were all variations on the Pengo coin-op game and Red Rat has now released a version for the ST.

You guide Eddy the Penguin through a maze of ice blocks – which he can push or melt – while avoiding the snow ghouls which try to kill him. These hatch from eggs and can be killed either by sliding an ice block over them or by stunning them by kicking the wall and then stomping all over them.

If you manage to line up special blocks – which can't be melted – you get a bonus. A scrambler block swaps four bonus blocks with four random ice blocks and this may help you to line them up for a bonus.

On the higher levels ghosts appear which slow Eddy down by stunning him. These can only be killed by trapping them in ice.

There is a sliding scale of scores ranging from 10 points for melting an ice block, up to 500 points for trapping a ghost. The instructions say you get 250 points for destroying a rock but they don't tell you how – they certainly won't slide or melt.

Lots of niggles, I'm afraid. First of all, the instructions scroll across the screen a line at a time at an agonising snail's pace taking almost four minutes. And control is by joystick only, surprising when keyboard control is often easier with up/down/left/right games. There isn't any music, only sound effects for sliding blocks and dying ghosts.

The first couple of mazes are easy enough, but after that they get harder very quickly. A few more easy ones at the beginning would encourage you to carry on. On the plus side there is a pause facility and a high score table.

Red Rat's Pengo variation is accomplished, but uninspired. What puzzles me is why, of all the games in all the world, this one was picked for conversion. It's very old hat and Red Rat has added nothing new to the concept, although it may be new to ST owners. Arcade games have come along way since 1983 and having zapped my way through half a decade I reckon I've done my time on Pengo variants.

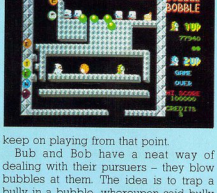
However, if you haven't seen a game like it before, do give it a try. I distinctly remember enjoying it although it does nothing at all to tax the ST in any department. Definitely one to try before you buy, even at a budget price.

Ian Waugh

Sound	***2***
Graphics	***7***
Playability	***5***
Value for money	***6***
Overall	***5***

Program: Bubble Bobble
Price: £19.95
Supplier: Firebird, 64-76 New Oxford Street, London WC1A 1PS
Tel: 01-379 6982

Here comes trouble



MANY people dislike arcade games for the simple reason that such programs invariably involve violence of one sort or another. So if that's what's holding you back from buying one, take a look at Bubble Bobble, a first-rate coin-op conversion that is wholly non-violent and pure arcade action from start to finish.

In essence, Bubble Bobble is a one or two player, two-dimensional platform game. The stars of the game are Bub and Bob, a brace of bubble-blowing brontosauri. The single player game brings on just one of the heroes while the two-handed option allows each player to simultaneously control his or her own brontosaurus. A second player can join in a single player game at any time.

The two little prehistoric charmers are chased from pillar to post by a variety of bizarre bullies such as purple Moby Dicks, diminutive white-cloaked figures and what look like chomping face visors.

When touched by a bully, your brontosaurus loses a life. He spins, flashes and looks decidedly unhappy for several seconds during which time there's not a lot he can do. One particularly nice touch is that by pressing the fire button quickly after all lives have been lost, you may keep on playing from that point.

Bub and Bob have a neat way of dealing with their pursuers – they blow bubbles at them. The idea is to trap a bully in a bubble, whereupon said bully will float away. But that's not the end of it: Any bubble containing a trapped creature must be popped quickly, otherwise the bully will eventually break free.

When such a bubble is burst, the creature inside turns into a piece of fruit or a treasure (realism is not this game's strong point) which must be touched by one of the stars to gain points.

Some special bubbles contain fire, water and lightning – popping these helps polish off the baddies even more quickly. Magic targets also appear: Touching these adds to Bub and Bob's powers, allowing them to skip screens, speed up, improve bubble blowing power and so on. If the brontosauri hang about too long, they will be told to hurry up – and just to ram home the message, everything speeds up.

Once a screen has been cleared, play progresses to the next. In all, there are 100 stages to be passed through, following which the game seductively promises a sudden reversal.

The animation and graphics are fairly simple, but certainly effective, particularly the bubbles. The tune that burbles away throughout the game is very catchy.

Bubble Bobble is an addictive and varied all-action arcade game. Its non-violent scenario and unaggressive content should widen the game's appeal to a larger audience, yet it manages to retain all the challenge and excitement that the hardened arcade player craves. Definitely one to buy.

Bob Chappell

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

Dazzling shoot-'em-up

Program: Backlash
Price: £19.95
Supplier: Novagen, 142 Alcester Road, Birmingham B3 8HS.
Tel: 021-449 9516

THIS is the one I've been waiting for. Author Paul Woakes first made my eyes pop out with his brilliant Mercenary. Now he's back with an even more dazzling display of graphic pyrotechnics in a superb development of Encounter, one of his earlier 8 bit games.

The usual sort of unnecessary and often laboured pseudo sci-fi synopsis has been eschewed in Backlash. As Paul says, you don't get a background story when you step up to play an arcade machine.

So Novagen has gone for a starkly simple game description which in essence is: Your objective is a high score. You have five lives. Keep moving. Shoot everything that moves.

Backlash gives you a full-screen view across an almost barren landscape – grey patterned ground, blue sky. Overlaid in the centre of the scene is a small, white, circular radar/head-up sights display with which you can detect the position of enemy forces.

Movement – forwards, backwards and sideways – is accomplished by joystick manipulation. Nothing special there except for the fact that you race smoothly across the land at an almost unbelievable speed. For, as players of Mercenary will know only too well, mind-boggling speed is Paul Woakes' business.

The plain turns out to be not so empty. Dotted here and there are large metal conical obstacles – they can't harm you, but smack into one and you'll hear the crash of metal upon metal. These are indestructible and come in handy for dodging behind.

Also scattered around the plain are flat, white discs – silos – which open up at intervals and release a powerful flying machine. Before you can say "Wossat?", huge fireballs are bouncing across the ground headed straight for you, courtesy of a squadron of airborne gizmos.

There are several types of enemy ship, including spinning tops, rainbow-striped discs, flying saucers and cylindrical monsters. They fire at you in patterns ranging from the casual lob through machine-gun rapidity to what seems like a virtual wall of flame.

Even more impressive and equally unnerving are the gigantic eyeballs which fly around and open up to observe you.

The game gets meaner the longer you survive and the landscape colours change to reflect the progressive levels reached. An extra life is awarded for every 5,000 points scored.

Novagen doesn't bring out many games, but when it does – oh, boy! Backlash is brilliant, a graphical wonder, that takes your breath away with its sheer speed, beauty and smoothness of action. At last we have a game that out-arcades the arcade machines. If you don't buy this fabulous game, you'll be missing out on a marvel.

Bob Chappell

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

3D arcade madness

Product: Marble Madness
Price: £19.95
Supplier: Electronic Arts, Langley Business Centre, 11-49 Station Road, Langley, Slough, Berkshire SL3 8YN.
Tel: 0753 49442

GO ahead – lose your marbles: That's the challenge offered by Electronic Arts in its latest offering, Marble Madness. Well, I certainly did that often enough, and I imagine many others will before they crack this startling implementation of the arcade classic.

The story started back in 1985 when Atari produced a game totally unlike anything ever seen before. Unbelievable 3D Escher-like surfaces provided the platform on which marbles and all manner of strange objects took part in a race against time, or simply to the finish line.

Like Space Invaders and PacMan before, the games-playing public was entranced and a host of similar style games swept into vogue.

Electronic Arts was equally impressed with the phenomenon and duly signed the license for home micros. With the ST proving to be the fastest selling machine in the UK, and Electronic Arts setting up shop over here, it was inevitable that an ST version would be forthcoming.

The idea is deceptively simple – just guide your marble across surreal plains, down gullies, along pathways and up and down ramps to a finish zone. On the first

level the only hazards are your own ineptitude, and the precipice hugging the home straight.

But the further you get into Marble Madness the more bizarre it becomes. The landscapes become progressively more mind boggling and outrageous, and roaming and stationary obstacles are the order of the day. Slinkys, enemy black balls, repelling blocks and magnets, and flapping bridges are just some of the hazards to contend with.

Possibly the most surprising aspect to the game, considering the standard set by previous ST programs, is the high quality of the scrolling. None of this reduced screen nonsense either – the whole screen slides smoothly down.

The only aspect of Marble Madness that is in any way disappointing is the sound. The music unfortunately doesn't come up to the expected standard.

Still, with its unusual setting, addictive gameplay and nicely designed sprites, Marble Madness will be a worthy addition to any gamer's software collection.

Mark Luckham

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

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The ultimate war game?

Program: Universal Military Simulator
Price: £24.95
Supplier: Rainbird, Wellington House, Upper St Martins Lane, London WC2H 9DL
Tel: 01-631 5168

IF you are a wargamer, what would you give for a program that offered five pre-programmed battles, a terrain map in contoured 3D, a viewpoint that could be changed from one showing the entire battlefield down to one showing an extreme close up of a few units, and enabled you to design and replay any battle up to the 20th century?

Well, Rainbird is only asking £24.95 for the Universal Military Simulator (UMS), a magnificent program offering all these features, and more. The battles include Arbella, Hastings, Marston Moor, Waterloo and Gettysburg, each of which is discussed in the handbook.

Once a battle has been loaded the initial view is of the battlefield. After deciding which army to take control of it's time to issue orders. Each unit is flashed in turn, and if it has any movement points left its orders can be issued by clicking on an icon corresponding to eight compass directions.

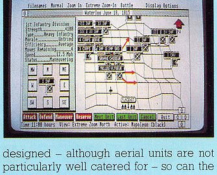
While this is happening a close-up view of the unit and its immediate surroundings is being marked with a black line and an arrow shows its intended path. Further refinements can be added in the form of attack, defend and reserve orders which affect how the unit will perform. The reserve order allows a unit to rest and restore morale.

There is only one problem with this arrangement: To issue orders to a division in the middle of the army ranks it is necessary to scroll through all the preceding units.

Once all orders have been issued it is wise to use the standard and zoom views to see the overall direction the following game turn will take. Each consists of one order phase, eight movement and eight ranged weapons phases. If you have a ranged weapon unit – archers, cannon, tanks – in firing range of the enemy then you can wreak havoc before the opposition has time to react.

After you have finished issuing orders, the program prompts for computer strategy. At this point it is possible to swap sides or force the computer to adopt a certain style of play, including defend and the following attack strategies: Left flank, central, right flank and double envelopment. In this manner it is possible to duplicate great battles of history.

Once the possibilities of the predesigned conflicts have been exhausted the full power of UMS comes into play with the battle design facilities. Not only can units of almost any persuasion be



designed – although aerial units are not particularly well catered for – so can the battlefield.

Although Universal Military Simulator has a few flaws – not seeing woods until you run into them is undoubtedly the biggest – it is still a hugely impressive piece of software. UMS heralds the dawn of a new age in computer wargaming and anyone with the slightest interest should be there to see the sunrise.

Mark Luckham

Sound	*n/a*
Graphics	*7*
Playability	*10*
Value for money	*10*
Overall	*9*

The peak of adventuring

Program: Chamonix Challenge
Price: £19.99
Supplier: Infogrames, Mitre House, Abbey Road, Enfield, Middlesex EN1 2RQ
Tel: 01-364 0123

CHAMONIX Challenge is the latest offering from Infogrames and is definitely worth a good look. Though the principle is simple – climb a mountain – it involves very careful preparation.

The graphics are well-drawn and from the large picture of a mountain presented, you must choose your route. As is to be expected these vary in difficulty. Once committed, you start to select which equipment to take with you on your ascent.

You are offered a pre-packed rucksack. If you accept this you begin your climb, choosing the time and season – this choice also affects the amount of light and temperature.

If you decline the rucksack offer you select your own equipment. Each piece of climbing gear is shown together with its weight. You must consider how much you can carry, the equipment you will wear and which items are essential.

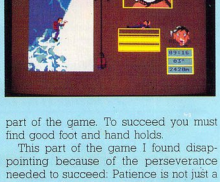
Though most of the equipment has a use, watch out for irrelevant items – such as the anvil. Weight is very important – if you overload yourself, you will collapse from exhaustion almost immediately.

I found boot spikes very useful as they are needed for climbing and are also useful if you fall down a ravine. A nice touch is that if you choose the personal stereo and use it while walking, it actually plays a tune.

Once the rucksack option is completed you are ready for the ascent. You'll find yourself on a freezing plateau, and your first priority is to clothe yourself adequately.

An icon of your climber to the side of the screen informs you whether you are hot, cold, hungry, thirsty or tired – vital information necessary to your survival. Also keep an eye on your glasses – the reflection will show you what is approaching, rockface or snow.

The rockface is the most frustrating



part of the game. To succeed you must find good foot and hand holds.

This part of the game I found disappointing because of the perseverance needed to succeed. Patience is not just a virtue in Chamonix Challenge – it's a necessity.

Andrew Newell

Sound	*5*
Graphics	*8*
Playability	*5*
Value for money	*6*
Overall	*7*

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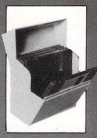

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A moral dilemma

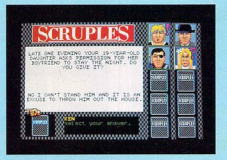
Program: Scruples
Price: £19.95
Supplier: Virgin, 2-4 Vernon Yard, Portobello Road, London W11 2DX.
Tel: 01-947 5624

SCRUPLES is one of the more successful of the new generation of board games to have arisen in recent years. It concerns moral dilemmas and judging how you and your fellow players would react in certain instances.

Each person begins with a few "dilemma" cards which outline set situations. A possible solution is also given and the skill involved is in choosing from Yes, No or Depends as the answer the player of your choice would give. What makes the game more interesting is that you and the other players have the right to challenge the answer.

The computer version is well-coded and graphic presentation and sound effects are all what they should be. The main difference is that you can allow the computer to control some or all of your opponents.

Players can choose from a large selection of characters, each being represented by a colour mug shot. Beware of choosing anyone with dark glasses as the graphics give some indication as to character, and dark glasses imply a certain amount of shadiness.



Once you have chosen your face you need to add your attributes. This is one of the main drawbacks of the game. Not only is it a long process, but also my pre-production copy allowed me to vary only one attribute for each human player.

Another niggle is really a design flaw. After a time all the situations are very similar, so that the initial fun turns to tedium. To some extent this could be overcome by extra discs, but the problem is not just the wording – the dilemmas themselves are very narrow in scope.

Scruples relies on the mouse a great deal, which makes play quite awkward as each player must use it in turn. In fact, cumbersome is the word to sum up the entire game – somehow the computer interferes rather than enhances. This is not much fun to play on your own and if you are with friends, you will get more enjoyment from the original.

This is a shame, as Scruples is well-produced. But it does go to show that some things are simply not suited to being converted for computers.

David Lester

Sound	6
Graphics	7
Playability	3
Value for money	4
Overall	5

Behind the Iron Curtain

Program: The Hunt for Red October
Price: £19.95
Supplier: Argus, Victory House, Leicester Place, London WC2 7NB
Tel: 01-439 0666

THE storyline of The Hunt for Red October, the latest release from Argus Press Software, sounds not dissimilar to that of Firefox (the movie); though whereas the latter is set in the air, Red October is an aquatic adventure.

You play the part of Captain Ramius, Commander of the Red October, the latest in Soviet submarine technology. It features the caterpillar propulsion system which is supposed to make detection nearly impossible. Having just been given command of this impressive piece of hardware you've decided to defect to the USA.

One of the many problems is that the crew is mainly faithful to Russia so you must surreptitously rendezvous with the US Navy and fake disaster in the nuclear powered engine room. The crew is to be given the impression the sub is being scuttled in order to get the members off, while leaving the Red October intact for the Americans.

So much for the plot. As far as the display goes, the programmer has not chosen the Silent Service route of multiple screens – there is one main window where periscope view, sonar and maps are displayed. Surrounding it are instruments and icons. It all looks very glossy, as a lot of effort has gone into the presentation. The ships seen through the periscope actually do look like ships.

The instruments on the left of the screen represent speed, heading and depth. You can change these by pointing at the numeric displays, but this isn't advisable as it is very slow. Instead, double click on the graphical representations of the data and the sub will rapidly move to the new position or depth.

On the right of the screen are icons covering sonar, engines, weapons, scope and maps. Selecting one of these brings up new icons relating to the pertinent operation.

With Reykjanes Ridge, the first underwater hazard to negotiate, you must initially tread warily to avoid both running aground and also having the Soviet Red Banner fleet coming down on you like a ton of bricks. Although initially speed is important – otherwise you get behind schedule for the rendezvous with the Yanks – avoiding detection is of paramount importance.

Graphically Red October is a very professional product. The sound effects are also good, which is surprising as none of them are sampled.

A handy feature is the ability to save the game, so that if an encounter goes disastrously wrong you can always reload. An odd facet to this is that you cannot restart the game, but there is an opening situation saved on the disc which can be reloaded if you lose the submarine.

There's only one minor complaint about the game, and that is that the mouse button is somewhat unresponsive, which can be irritating at times.

It would have been nice if Argus could have seen its way to bundling a copy of the Tom Clancy book that Red October is based on, as this would give more feel for the scenario. As it is, I recommend you do buy a copy first, if you want to undertake this challenging submarine simulation.

Mark Luckham

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

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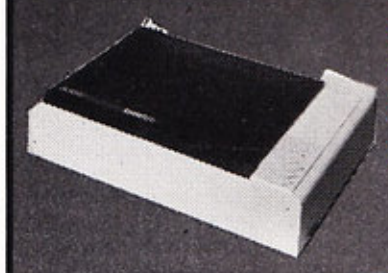

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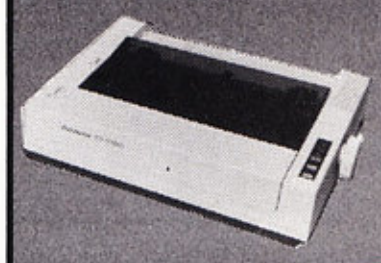

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Quick Peeks...

Marcia Davies casts a critical glance over the latest releases

Perfect Match – *Microdeal*

PERFECT Match is a variation of the old memory game, Pelmanism. In the original, you turned over two symbol cards and tried to match them. If no match was made the cards were turned back.

Good players could remember where every hidden card was and would therefore know where to look for possible matches. Likewise in Perfect Match, the object is to match two hidden cards, a question and an answer.

It is here the game adds a new dimension to Pelmanism. Not only do you have to remember where the cards are, but you must also know the correct question and answer combination.

A Help option is available if you don't know a particular answer. Surprisingly though, this gives the complete answer as opposed to just a clue.

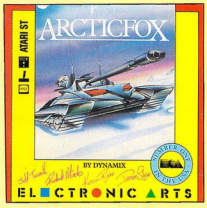
Perfect Match is the sort of game I'd expect to see in the pages of *Atari ST User* – it's only magazine quality. However, it does win some praise with its comprehensive set of questions and good graphics.

As an educational tool, I have my doubts. In my expérience, children soon get bored by this kind of game.

Arctic Fox – *Electronic Arts*

THE Arctic Fox of the title refers to 37000Kg of ultra modern fighting machine. A battle tank designed with the Arctic wastes in mind, it features a Sly-Hicks Turbo diesel developing 600hp and capable of driving the machine at a hair raising 100mph across the pack ice.

Just as well this prototype is tough, because the game throws a lot at it. Set in the year 2005, the Fox battles with aliens bent on taking over the Earth. Quite why they have set up base in such a cold climate wasn't too clear – I couldn't fathom out the German instructions (these will be converted to English when the game is released).

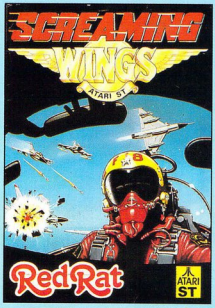


Strongest feature of Arctic Fox is the graphics. The whole world of the game is shown from inside the cockpit of the tank. The 3D solid graphic display isn't up to the standard of say, Flight Simulator II, but quite adequate nevertheless.

The objective is to travel across the ice and locate and destroy the enemy base before they get you. The bottom of the screen features a radar display, which greatly eases the task of locating the bad guys. It is unreliable in bad weather, though.

This is a nice shoot-em-up with reasonable, although not brilliant, graphics and a certain level of strategy. Worth a closer look.

Screaming Wings – *Red Rat*



JUST a minute. Is this a case of severe déjà vu? Apparently not. Reviewing the original Screaming Wings in the January 1988 issue of *Atari ST User*, Bob Chappell writes: "some digitised sound would have beefed up the game no end".

Lo and behold, a new version of the game appears with sampled sound, courtesy of ST Replay, and very nice it is too. The best is when the game screams "Game over man, game over" with intonation that has to be heard to be believed. Needless to say, this creates loud and riotous laughter from your audience.

For the most part the game play has not changed much, even though Red Rat would claim otherwise.

Incidentally, Red Rat is offering an upgrade service to the new version free of charge for existing owners – must be worth investigating.

Mach 3 – *Loriciels*

MACH 3, like almost all ST games that have originated from across the Channel, features a scantily clad young maiden. Somehow or somewhere the Gauls always seem to manipulate the female form into their games. This outlook continues here with the final objective being to rescue the gorgeous Gwendoline from the clutches of the evil sorcerer, Sfax of Mars.

Oddly enough, when it comes to playing the game none of this hype is necessary. The view of the spaceship is in 3D, flying across the wasteland of a once green planet, heading for the sunset and beyond.

Along the way you face attacks from missiles, meteorites, rebel spaceships, land mines and eventually Sfax himself. Fly through the time gates and progress to the next level.

That's all there is to it. The graphics are nice, the sound reasonable, the gameplay challenging and the action very fast.

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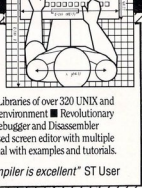

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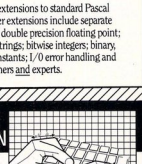

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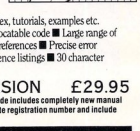

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Programming the Olympics

The Tynesoft team with head of development David Croft (bottom right)

Mark Smiddy reveals how Winter Olympiad – reviewed on the next pages – became an exciting ST reality

COMPUTERISED sports simulations have been popular ever since the very first Hyper Sports machines appeared in the arcades. Inevitably, versions and copies appeared in every shape and format.

Copying someone else's design is simple enough, but creating a game from scratch opens a whole new can of worms. It requires a lot of careful thought, planning and hard work to come up with the final product.

When the Tyne and Wear based company, Tynesoft, decided to write Winter Olympiad '88, it quickly discovered it was faced with a mammoth task. To make the project a viable commercial proposition, the game would have to be written on all available computer formats – the ST version being the flagship, setting the standard for all the others.

With all current projects shelved in preference, the development began in early August 1987 and reached fruition four months later.

"We were determined Winter Olympiad '88 would surpass all other sports simulations, in terms of realism, playability and visual presentation", said David Croft, Tynesoft's head of development. "To this end, we assembled a team of the best artists and programmers to be found in the North. We then spent several weeks watching videos of winter sporting events."

When the events and format had been decided on, programmers and artists retired to the dark chambers of Tynesoft's offices to commence work. Initially, the greatest task fell on the shoulders of the graphic artists. Their job was to produce the immense numbers of sprites and game backdrops to the programmers' specification.

"We soon realised this vast amount of work was going to be too much for the number of people working on the project", said Croft, "and it became apparent if the game was to be released in time for Christmas 1987, we'd have to get some more people in.

"Fortunately, one of our 68000 programmers had some friends who'd recently acquired an ST. After viewing some of their work we commissioned them to produce artwork for the ST and Amiga versions. This brought the total number of artists working on the project to six".

All the sprites, backdrops and statics for the games were produced with Degas Elite. The final results show the determination and effort put in by the whole team. Surprisingly, the graphics have even been converted directly from Degas and ported across to the Amiga.

While graphic design continued, programmer Chris Robson was hard at work on the first ST events. Although the ST is very powerful graphically, it still provided its own problems. He explains: "The screen layout is complex, and lacks a proper hardware scroll facility.

"Several games require this feature and had to be written using special techniques. In particular, the slalom uses 200k of pre-shifted graphics data to form the screen. After saying that, I still prefer the ST to the other popular 68000 based machines".

While programmers and artists worked long into the night, managing director Colin Courtney was spending many hours negotiating with BBC Television for the rights to the theme music from its popular sports program, Ski Sunday. At the same time he also persuaded Ski Sunday's presenter David Vine to contribute, by writing an introduction to the 1988 Winter Olympics to be included with the final package.

Towards the end of development, Tynesoft decided to include a competition to run in conjuction with the game. The first prize – an all expenses paid trip to Calgary – was arranged with the Sports World Group, official ticket and tour operator for the Olympic games. The lucky winner and companion will spend seven days in the beautiful Canadian town of Banff and be chauffeured to view the best the winter Olympic games have to offer.

Naturally, with all of this hype and pre-production publicity the pressure was on the programmers to finish the game on time. Many late nights ensued, and the sound of whirring disc drives and the tapping of keys could be heard drifting across the early morning Blaydon countryside.

To make matters worse, just before the first ST version was ready for testing, Atari announced the introduction of the new Tos roms. Rumours came thick and fast about programs needing massive modifications, and other major software houses having to re-master thousands of discs.

Perversely, the only problem with Chris Robson's programming lay deep in the software protection. Once this minor infelicity had been sorted out, the whole package ran without problem.

Finally, in November 1987, the first versions for the BBC Micro and Electron were finished. These were closely followed by packages for the Spectrum, Commodore 64 and ST.

The ST version took over 800 hours to program and more than 200 to design. And, in the end, just how good is the finished product? You can find out for yourself by reading Julia Forester's review on the following pages.

ATARI STAR USER GAME

Thrills of winter sports – in 700k

Product: Winter Olympiad '88
Price: £24.99
Supplier: Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne and Wear NE21 4TE
Tel: 091-414 4611

TO celebrate the 15th Winter Olympic games in Calgary in Canada, Tynesoft has released its own interpretation of the proceedings for the ST.

This excellent package enters you in five of the toughest winter sports, all requiring skill, nerves of steel and determination. To complete the atmosphere, the package is supplied with a booklet introduced by top sports commentator David Vine.

The games come on two discs containing a massive 700k of programs and data, which gives some indication of what is about to unfold.

Booting the game provides a rendition of the music from BBC television's Ski Sunday. First you are presented with a pictorial electronic score board, backdropped against a very pretty winter snow scene. This is used at intervals throughout to display menus, score tables and what have you.

The initial option given is to load your own set of world records. The records are not saved on the original disc, so at the end of the game it's quite possible to keep more than one set.

The next options select the number of players competing, their names and country. Finally, the events are selected. The opening ceremony is first on the list and while it's worth a look first time round, I suspect most people will skip it on subsequent occasions.

When the preferences have been set, the drive whirrs and the games commence. The opening screen shows the, olympic arena with the flame burning merrily. At the bottom of the screen the crowd slowly invert a series of cards displaying the title of the software.

Hit the fire button and it's off to the top of the mountain so get ready for the downhill. The opening screen presents the player crouched down, sticks in hand and ready to go.

Push the button and the the fastest of the two downhill events begins. The screen shows a view from behind the skier as he attempts to weave between the trees, avoiding fallen logs, rocks and treestumps.

Control is relatively simple. Left and right swing the skier in a beautiful sweeping motion as he attempts to duck and dodge the barrage of saplings as they whizz past him.

Surely the alpine ski run isn't this dangerous? There seems to be a rock lurking behind every tree on the course. Often the only way to spot such obstacles is to look out through the skier's goggles, located at the lower right of the screen.

A quick click on the fire button launches the skier into the air – often the only way of avoiding a passing rock. Otherwise, hitting an obstacle results in the poor guy seeing stars.

At the end of the course, the skier pulls into the spectator's ring for a well earned rest. The final and best times are displayed at the bottom of the screen.

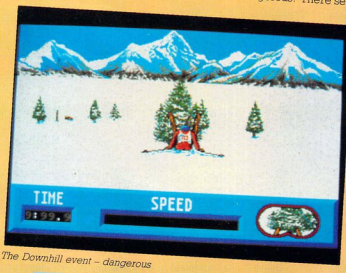
After three attempts, the electronic scoreboard displays the results and medal table. Click the fire button and it's on to the next event, the ski-jump.

The initial view is looking from behind the skier, depicting the enormous ramp stretching away into the distance. Click fire and the skier walks from the lodge, on to the start line and dons his skis.

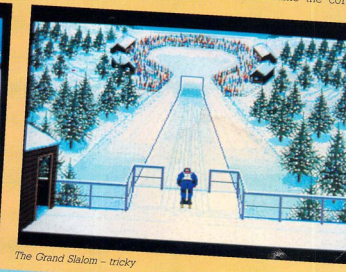
Click to start and the skier heads off into the wild blue yonder. Another click launches him from the end of the ramp. Correct timing at this stage is not easy, although crucial to the final distance travelled.

Phase two begins, as the background scrolls smoothly and quickly past giving the impression of real speed. The skier's airborne antics are controlled entirely by joystick. Four different movements manipulate his posture constantly, from a crouch to out of control, with arms and legs swinging everywhere.

The objective here is to keep the skier in the correct, forward posture as long as possible and then assume the correct



The Downhill event – dangerous



The Grand Slalom – tricky

landing stature just before hitting the ground. The skis must be level on impact or the skier ends up in a tangled heap.

After spending many agonised hours practising this event, I've come to the conclusion it's a lot more tricky than it appears to be at first glance. The game even seems to take account for wind resistance. For example, spending too much time in the landing position ends in a crash.

When the correct landing is finally achieved the skier rolls on into the spectator's gallery, and stops with a short twisting motion, just like a real person.

The third event is the biathlon. This involves travelling around a long course on skis and shooting sets of five targets provided at various positions along the way.

Of the five events, this one is by far the easiest, although it does tend to be a mite boring. The skier is made to move along the course by moving the joystick left and right in slow rhythmic movements. At least this is one sports simulation that won't be accused of wrecking joysticks.

The blurb supplied says the biathlon is the most gruelling of all alpine events. This is because the skier not only has to negotiate a long woodland course, he also has to compose himself at regular intervals in order to shoot the targets.

To this end he will have to overcome a rapidly beating heart, high levels of adrenalin and the weight of his .22 calibre rifle.

As good as this section is, it doesn't seem to recreate the feeling of tiredness on the part of the player – perhaps it was just me slouching in my armchair. The targets are always fairly tricky to shoot, with the simplistic circular sight drifting off course at the slightest provocation.

Fourth in this impressive line up comes the downhill slalom. Keen observation pays off on the start screen because a Santa Claus, and even a pirate, can be seen standing among the crowd.

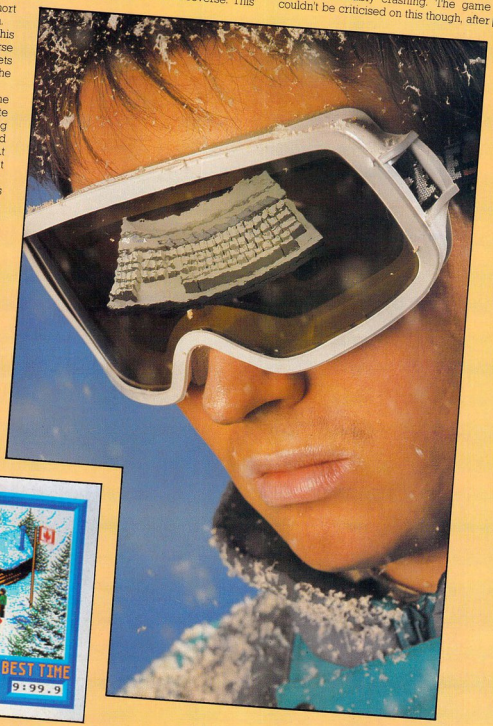
Once again press the fire button to start and the little skier heads off down the mountain slope.

The first time I played this one I went straight down. Sadly however, I was soon to discover this apparent bug was just amassing me a lot of penalty points.

Playing properly took considerably more practice. The angle of view – unlike the downhill or the ski jump – is from right to left rather like Zaxxon in reverse. This didn't make matters any simpler though.

The idea is to go through each gate with the red pole on the skier's right and green on the left. Achieving this in practice is not quite so simple, however.

The graphics feature some very fast scrolling, rather like those in the ski-jump. The skier can even disappear behind the trees in the foreground. While this is a nice effect it usually ends in the skier unavoidably crashing. The game couldn't be criticised on this though, after ▷



The Biathlon – by far the easiest

all part of the skill is staying on course.

Last, but certainly not least, comes the two man bobsled. The idea of this section is to get the sled down the 1.5 km run in one piece. Speeds can exceed 90 kmph and it feels like it.

As each run starts, and there will be three in all, the initial speed of the sled is governed by some manic wiggling of the joystick. At the end of the permitted run the two chaps leap athletically into the sled and the ride begins.

The right-hand edge of the screen is half filled by a map showing the current position of the sled and what is about to come. This is broken up by impressive looking bridges which whizz overhead, displaying adverts for you know who.

As the finish line gets nearer, the bends get tighter and the speed gets higher. The ice whizzes past at break-neck speed and bends seem to come out of the blue. As in real life the sled has poor steering and even less in the way of brakes.

As each bend is entered the sled has a tendency to climb the slides of the trench. The obvious way to correct this is to steer in the opposite direction. Overcorrecting however, can throw the sled clean out of the other side of the trench.

Overall, Winter Olympiad is great fun to play. The sound effects are a little drab, but the music is good and spectacular graphics are used throughout. The gameplay and speed compliment each other and, although some events are more difficult than others, everyone should find at least one to suit them.

Julia Forester

The ski jump event – view to a kill?

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

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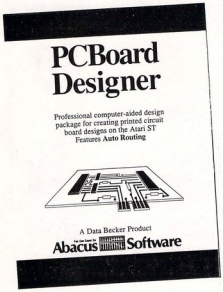

Designing a circuit the easy way

Andrew Donald tests Abacus' professional PC Board Designer

DESIGNING the layout of a printed circuit board is a difficult and onerous task – one which PC Board Designer from Abacus is designed to make just a little easier.

The program comes on two single sided discs. The first is the main program and utilities, the second a variety of printer drivers. A 520 or 1040ST with monochrome monitor is required.

The basis of the circuit construction is a preformed library of component definitions. A utility is provided to allow extra definitions to be added or the construction of new sets of component libraries.

The program itself requires a list of the library components needed for your particular circuit. After this a list of connections has to be entered, and from this information a layout is constructed.

The outline components are displayed on a board which may be any size up to 6in x 4.5in, and they can be moved around and put into a suitable layout. At this stage the component connections are rubber-banded, so they may all be seen.

With the components in their approximate positions, you select the PCB display and autorouting from the menu. The program will then lay out the PCB and automatically draw an arrangement of tracks. If your suggested connections are impossible the program will inform you and allow you to contrive a more suitable layout.

You may also ask for a different arrangement of connections which can facilitate the task of the autorouter. You then enter an interactive dialogue of rearrangement, layout modification and automatic routing until a design is achieved with which both the computer and yourself are satisfied.

Special requirements such as prohibited areas of the board, jumpers or special track design may be incorporated. Options are provided for 45 or 90 degree angle traces, different trace widths, routing from pin to pin, pin to bus, bus to bus, and for double-sided boards.

The result is a PCB board design, which may be output to a variety of printers for more exact photographic reproduction. Other output features are a component layout, lists of components and connections and a solder mask.

The heart of this program is the autorouting, a notorious difficulty with PCB track design. With a large number of connections, almost infinite arrangements of tracks are possible, and one track laid early in the design could well get in the way of others which will be following later. This is an example of a combinatorial problem.

The number of possible track arrangements rises exponentially with the number of connections involved and even a simple circuit will contain a fearsome number of possibilities. If you wonder at the price of this program (£195), then it is this that you are paying for.

A lot of thought and programming has gone into keeping this problem under control – and with some success.

A practical program has to use a mixture of routing methods to keep the computional time within practical bounds, and here the authors appear to have been reasonably successful.

Given the current limitations of artificial intelligence, the human eye still has the edge when it comes to the speed of seeing a suitable connection on the board. The authors have sensibly allowed the mixed interaction of manual and auto routing to achieve a solution in a reasonable time.

It does take a long time to get to know the program, and it tends to be idiosyncratic. The heart of the program is the implementation of the auto-routing algorithm, and it is here that most of the work has been done.

The unfortunate thing is that this is not what a user is aware of when operating a program. It is all the little quirks and foibles which leave the impression in the mind and although these are minor they can be annoying.

For example, the component editor has four fields per line and to terminate a field you press Return. It is then disconcerting to find that the field separator on multiple entry connections is now Tab.

The handbook suffers from a common failing: Starting with good intentions – "... position the mouse pointer to the floppy ▷

AUTOROUTING

One of the approaches to the problem of autorouting is that by proposed by Lee in 1961. The authors of PC Board Designer themselves make reference to this algorithm, which works on the principle of dividing the board into cells so that laying a track consists of finding a network of isolated cells between the source and destination.

The algorithm invokes a search pattern from the source cell which may be compared with the ripples spreading out from a stone dropped into a pond. The cells which are possibles for the track keep propagating the wave-front until the destination cell is found – or not found as the case may be.

The track is then laid back to the source using what is known as the Manhattan distance. This is the minimum sum of horizontal and vertical distances between the points.

The time taken to find a route between two points, n cells apart, is proportional to n squared. It can be appreciated that the auto-routing of a complete circuit could take anything from minutes to days, depending on the numbers of components and connections.

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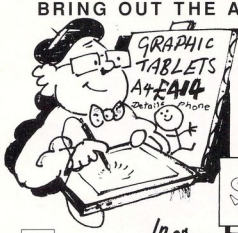

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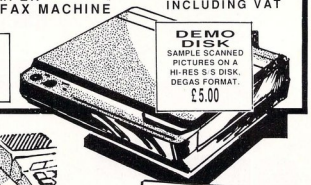

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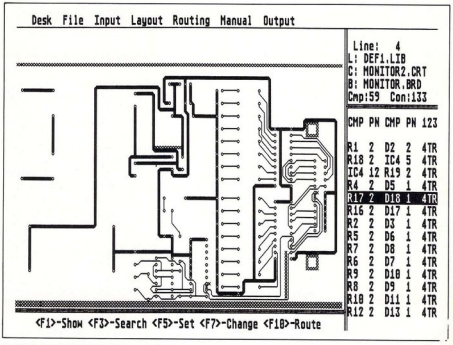
disk A icon. Double-click this icon (press the left mouse button twice in rapid succession) to open a window.", but tailing off later to far more cursory descriptions which leave you thumbing through the pages mumbling, "But how do I ..".

An example of this arises with the component definition program DEF.PRG. You are told how to position pins and that F1 changes to a rubber-banding cursor which allows you to outline the component. It is only by looking at program menus that you will find that F3 switches it off – this is not mentioned in the handbook.

To be fair though, it is a pretty good attempt at a full explanation and does include tutorial examples which will take you through the full process step by step. If you are anything like me, you will need to do each several times to catch on.

Other, rather more fundamental, criticisms came to mind from time to time. The program is capable of operating on double sided boards. In the description of error reports the authors say that the error report for double sided routing is not shown as the display would not make sense. And similarly, displaying both sides of the board at the same time is not possible and is dismissed on the same grounds.

Having used a drawing program for designing PCBs in the past, I had set myself up with a double sided system in medium resolution by using green for one side, red for the other and black for common. I could then, by manipulating colours, show either side alone in black and white or both together superimposed in the four colours.



A finished printed circuit board design

Now, it may be that the authors have some very good reason for not using medium resolution for their program, but if so, I would like to have seen some mention of it.

Being able to show both sides of a board at the same time is something a computer is very capable of doing and which gives it a great edge over reality. It can be very useful to the designer.

Positioning a via (through board connector), requires seeing the tracks on both sides of the board to get the best position. You will find yourself having to go through the procedure of switching back and forth between sides before being able to determine the best position.

I need a better explanation of why I should not be able to see both sides of a board at the same time other than just a dismissal, particularly when I know it to be possible.

The program seems reasonably stable, although I have had on occasion a stuck menu. And I still have not yet managed to delete a component from the given list: It may well be that I am missing something.

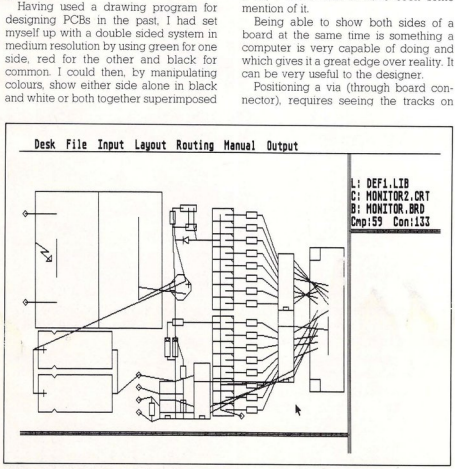
Occasionally I have an odd bit of track which seems not to want to be deleted – the program tends to be "wilful". To erase bits of track requires pixel precision in the positioning of the cursor, which is not easy in high resolution.

The annoying bit is that an error alert box appears to tell you when you are wrong and requires that you move to its Ok button and press it before permitting you to return to have another go at the individual pixel you were after. And this attempt is just as likely to end up in failure.

Using PC Board Designer is not just a matter of sitting back and allowing the program to draw your circuit. Be prepared for a lot of text entry and button pressing before your circuit is complete.

This leads to another fundamental criticism. Why is so much text entry necessary? The components could have been selected by presenting the library and using the mouse to point to the items required for the circuit.

Similarly, rubber-banding is used by the layout to represent connections. Why ▷



Rubber-banding a component layout

could not the method have been employed for entering the original connections? A text list is tedious.

Probably the most serious limitation is the inability of the program to allow single sided components such as surface mounting ones.

All definitions have through board connectors and so it is not possible in this arrangement to have one component one side and something else on the other except by manually drawing the connections or pads. This does constitute a serious limitation when the modern tendency is towards surface mounting components.

The output part of the program is the area in which I found the most confusing. Printers supported are mainly the Epson series, but drivers are included for Nec, Hewlett-Packard and Toshiba.

This is the second version of this program to appear on the market and the update appears to be all in the area of printer drivers. There is some confusion over this in the handbook.

On the recent version of this program the maximum size of circuit board has been increased to 6in x 4.5in. Although printer and plotter drivers have been provided for a number of devices there are README files which say that some of these are not working with the increased board size. It also appears that some options of output size, (1:1 or 2:1 ratios), are not possible.

The handbook refers only to the printer options available within the program. In fact it appears that these have been disabled and all printing is done by the separate drivers available on a second disc.

I say appears, because nowhere did I find anything to tell me this. It was only by experimenting that I found the printer drivers reproduce the output options of the program and so allow printing for different systems.

It seems that the full 4.5in width may be printed on an FX100. I can report that the Epson driver will work satisfactorily with an FX-80 with boards up to 4in wide. It prints at a 2:1 ratio for the circuit board and the component layout.

If you wish to use it with other printers or plotters, I would suggest you check with your dealer that your printer is suitable and preferably see it in action before buying the program.

This program will prove useful to someone who currently spends the major proportion of his working life in designing PCBs manually. It needs a high level of familiarity in order to get the best out of it, and the price tag is likely to keep the weekend PCB designer at bay.

Overall, there is a lot going on in this program and it has some powerful features. It is just that to get the best from it, you need to be very, very familiar with it and prepared to do a great deal of manipulation of its facilities.

Product: PC Board Designer
Price: £195
Supplier: Abacus/Adamsoft, 18 Norwich Avenue, Rochdale, Lancashire OL11 5QZ.
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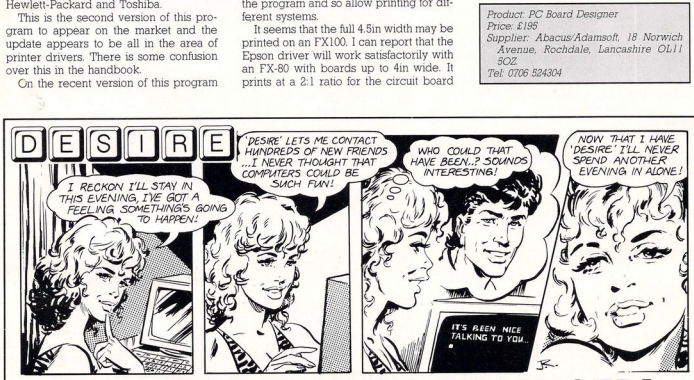

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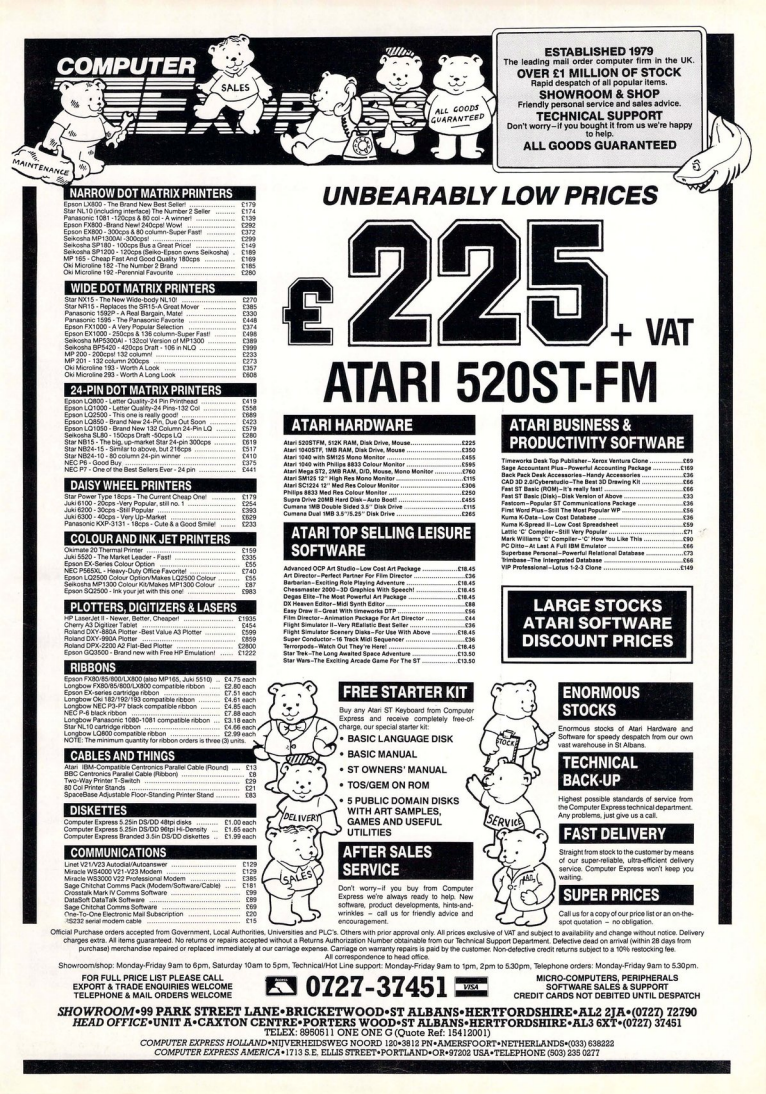

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Not quite perfect...

Is this latest version of the top-selling WordPerfect word processor up to scratch? Bruce Smith finds out

WORDPERFECT first showed its colours on the PC scene, where it has become the most popular of all word processors, integrating with a whole range of sophisticated software from its originators, the WordPerfect Corporation in the States.

This success has seen the idea re-worded for many popular home micros including, with this new release, Version 4.1, the ST.

The package includes a spell-checker and thesaurus, both indispensable if a word processor is to be used to its full potential. If a software's potency is measured by the weight of the package then WordPerfect has a head start.

A 600 page ring-bound manual accompanies the seven discs which contain the various components, not to forget a function key strip and quick reference card.

A minimum of 512k of memory is needed, so WordPerfect runs on a standard Atari 520ST, 1040 and Mega ST. In the 520's case you'll probably have to remove any desk accessories installed.

Another good point is that it will run from a single disc drive. So much quality software available for the ST these days requires dual drives. However, it is more efficient when run with a second drive, floppy or ram, or a hard disc.

WordPerfect is usable from a single drive. Though it must be said that this version shows every indication of having been developed on a hard disc without any extensive testing on either a single or dual drive system.

A number of serious operating difficulties were encountered when running the software on a floppy disc-based setup. I'll cover these later.

Getting WordPerfect up and running is reasonably easy and just requires you to make a backup copy of each of the seven discs. This is simplified by the inclusion of backup software with the application.

The backup software also formats the disc for you – nice, but why not mention that in the manual – it's terribly annoying when you spent half an hour previously formatting a pack of the things. Hard disc owners have just to create a number of folders and drag the various components from each disc into the relevant folders.

The final installation step is to configure the software to suit your own needs, such as defining file path names and so forth. This is reasonably straightforward, but could be made so much better if the otherwise excellent manual set about not only explaining fully each part of the setup, but provided some real examples.

This part of the procedure is likely to be the most difficult for the user, so guidance is needed. I found I needed to alter the configuration of my system continually as I went along to get things fine tuned exactly to my liking.

Clicking on the WordPerfect icon on the Desktop sets WordPerfect into action with the screen clearing to a black on white screen. The colours can be changed should you wish.

There are two entries into the system direct and indirect. The latter enters via a dialogue box into which you can enter the name of the file you wish to load for editing.

Once up and running, a standard menu bar is displayed across the top of the screen. This has seven pull-down menus providing all the features you would expect. These can be selected with the mouse in the normal manner, but are also accessible from combinations of Control, Shift and Alternate and function key presses. This to me is vital as it is infuriating to have to take my hands off the keyboard when typing.

There are 40 different key presses, so it's important that the function key strip is in position – it sounds a lot, but they are quickly learnt. That said, a number of options are only available by using the mouse – which is a shame.

Typing is straightforward; the mouse or arrow keys can be used to position the cursor. By default, WordPerfect works in insert mode, that is, any characters entered shuffles the text following it along. It is possible to work in overtype mode where new text is typed over old. The software is fast and had no trouble accepting characters as fast as I could hit the keys.

A variety of text effects are available from the keyboard. All the obvious ones – bold, underline, centre, left and right justified, superscript and subscript – are displayed. The accompanying screen dumps show how these appear on-screen.

Disappointingly the ST's graphics capabilities have not been utilised to provide a page preview facility as is becoming so common now on virtually all new word processors.

The on-screen fonts are also limited to an 8 x 8 grid and a larger 16 x 8 grid. The character pitch is limited to standard elite and pica (10 and 12 characters per inch). ▷

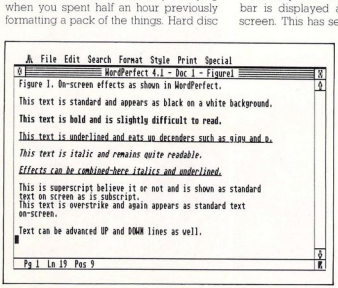

Figure I: WordPerfect's on-screen effects

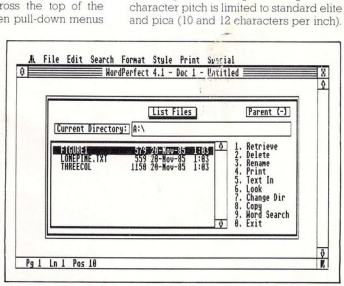

Figure II: File management using the List Files option

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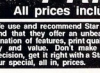

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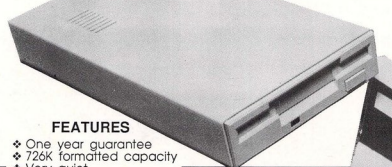

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◁ All the other usual facilities are available, including search (global and single occurrence), replace and block text operations.

The search and replace facility is a good implementation and can be made on the entire document, progressing either forward or backward from the cursor position.

If the search word is entered into the ensuing dialogue box as a series of lower case characters then lower and upper case letters will be sought. If the search word is entered in upper case or combinations of both upper and lower case then only exact case matches will be sought.

Another useful option is the ability to search through a whole series of files for a word or series of words – very useful when referencing material from other documents.

The replace feature works much like the search option, but the replacement string must also be entered. The replace can be undertaken either with or without confirmations.

Block operation features include copy, cut and paste and can be made on any size section of text that has previously been selected. These all worked fine, though there was no facility to examine a clip board of cut text to see what had been cut and was about to be pasted somewhere else.

Similarly, even when text had been copied or cut from a document these two options still remained highlighted in the menu bar, so making it possible to overwrite text which had been cut, prior to being pasted elsewhere.

Just doodling, trying to cut and paste text I managed to hang the software up and had to power down the ST and re-boot.

Text for letters and books is normally typed across and down a page, but WordPerfect allows you to format text into columns across a page like a newspaper. Up to five columns can be fitted across a page and it is possible to mix text of one, two, three, four and five columns in the same document, which is a particularly good presentation aid.

Defining the columns is performed via a series of dialogue boxes into which you enter the number required and the amount of space between each. Columns will normally be equi-spaced, but you are also given the opportunity to create columns of varying width.

The accompanying screen dump shows a simple but effect example of what can be achieved using pure text. Other practical applications such as mail lists also come immediately to mind.

The spelling checker is based on a 115,000 word English dictionary – English as opposed to American, which is important due to the discrepancies in spelling between the two.

As mentioned at the onset, a spelling checker is good not only because it corrects those problematic words, but also because it points out typos, that is, words which are basically correct, but may have had a pair of letters transposed, for instance.

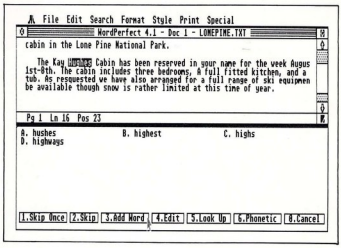

Figure III: Using the spelling checker

This means you can get on with the task of entering text without worrying about accuracy, as the spell checker will point out the ones you miss on reading it through.

Being disc-based, the spelling is rather slow and tedious when checking a long document. This of course, is a function of the mechanics of the disc drive rather than the fault of the software, but it is worth bearing in mind.

On one megabyte machines you can create a ram disc to hold the dictionary, which speeds the process up no end, as does operating it from a hard disc.

Words, pages or an entire document can be checked and for each word that is not in the dictionary a list of similarly spelt words are displayed in a window on screen. If the correctly spelt one is shown it can be selected and inserted into the document.

Options also include a look-up facility – ▷

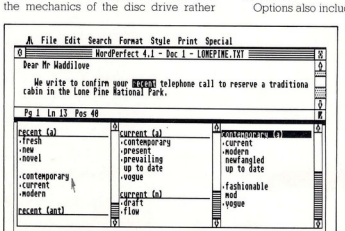

Figure IV: Using the thesaurus

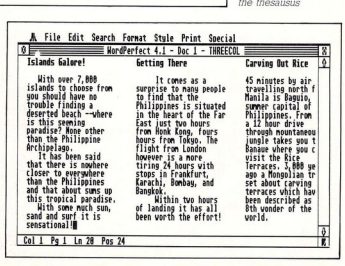

Figure V: Creating columns in WordPerfect

◁ if you want to know how to spell a word you simply type it in the way you think it's spelt and let the software do the rest.

Of course, the checker can only recognise words held in its dictionary and you are likely to use a lot that are not there. So words can be added to a supplementary dictionary which the spelling checker will look through if it cannot find the word in the main dictionary.

As a writer I'm always happy to see the inclusion of a thesaurus as part of any word processing software. This one is based on 10,000 headwords, that is, words which can be looked up in the thesaurus from which synonyms (words with same meaning), and antonyms (words with opposite meaning) can be displayed.

Like the spell checker, the thesaurus has its own disc, which must be in the drive. Using the thesaurus is simple – just place the cursor in the word you are not too happy about and select the thesaurus from a menu.

A list of possible replacements are displayed in a window below the text. One can then be selected or form the basis of another search through the thesaurus until the ideal word is found. The software is very quick and can be run from disc with no real loss of speed.

The ability to be able to create footnotes for the reports and proposals is most useful, and this is catered for by WordPerfect. In doing so, it automatically numbers, re-numbers and adjusts page lengths to accommodate them.

Endnotes may also be made and these are inserted at the end of the document. With the cursor at the position the note is required. Footnotes is selected and then created or edited by choosing an option from the menu presented.

Both foot and endnotes may be up to 16,000 lines in length and all of WordPerfect's features are available. On exit from the note window the number of the note is inserted into the document at the cursor position. In practice the endnote option worked fine, but no matter how I tried I could not insert a footnote into text which was contained within columns.

WordPerfect contains so many features there simply is not enough space to describe them all. However, a few of the more important ones are mentioned here:

A powerful feature to have in any word processor is a macro. These, when defined, can contain frequently used text such as a standard letter for instance, which can be re-called with a couple of key presses.

WordPerfect provides this and what's more, allows a macro to call other macros, which if taken to its logical conclusion could result in an entire document being written simply by executing a single macro keypress!

WordPerfect also provides a full hyphenating feature for splitting words across lines in formatted text, thus avoiding ugly spaces that may be inserted to pad out text to either margin.

Words and headings may be marked from which a full index and contents list can be generated. Up to five documents may be worked on at any one time, memory permitting.

The range of printers catered for is also extensive and just about everything from a 9-pin dot matrix to an Apple Laser Writer Plus can be driven.

While containing a very good tutorial section with example screen shots, I encountered many discrepancies between what was printed in the manual and what appeared on screen.

While most of these were quite obvious – like being told to select option four when you really need to select option three – they could prove confusing to the newcomer.

Having used WordPerfect on the PC, I know it to be a quite excellent piece of software. It really is annoying then to encounter so many problems when running the ST version, which I would love to say 'rush out and buy. But I certainly wouldn't trust any of my text to it as it stands now.

However, my advice is to wait a while – its release may have been a little premature. When all the bugs have been fixed it will be a great piece of software.

PROBLEMS ENCOUNTERED

There were a number of serious problems, not least the difficulty that can occur when trying to access files from disc because of the software's inability to recognise the backslash character.

If you wish to use the Retrieve option it is impossible to extract data from anywhere other than the current directory unless it is first changed via the List Files menu, and then great care has to be taken not to delete it accidentally.

The solution is simple – keep all files in the root directory and don't leave it. This is not ideal when a powerful hierarchical filing system is at your fingertips.

The number of times the software hung up was disconcerting. When preparing a screen dump I pressed the wrong key and could do no more until the machine was switched off.

Another time when spell-checking a document the program crashed. I could cite other examples particularly when more than one window is open.

The software also seemed to take offence when it couldn't find a file, for example when looking for the thesaurus when I hadn't swapped the disc before choosing it.

If I had a pound for every time I received the "Can't create virtual or space file" error when trying to load from disc using the List Files options I'd be very happy. Trying to solve the problem was impossible, as the error isn't documented in the manual.

Having said this, most if not all these bugs are known and the company is working flat out to fix them.

By the time you read this review they may well have been cured. However, it would be worth checking that the software is bug free before considering spending your cash.

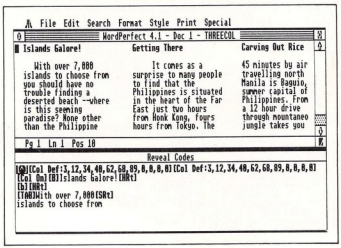

Figure VI. Revealing hidden control codes

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From aliens to spacemen

How to print colourful sprites in Part 8 of Stephen Hill's useful assembly language programming series

THE word sprite means different thing to different people. In mythology, the sprite is a mischievous, elf-like character. In computer terms, however, the sprite is a user-definable character block, generated either in hardware or by software.

To illustrate this, let's think of the screen as a vertical wall and the sprite as a tile. We can place this tile in front of the wall, and slide it around on its surface. The background underneath will be hidden. Sprites work in a similar way and can move in front of any figure drawn on the screen to create a simple 3D effect.

To begin with, we'll keep things as simple as possible by setting a few restrictions to the movements of our sprites. The most serious limitation will be to constrain our sprites to x coordinates lying on the boundaries of 16 point groups.

This makes more sense if we remember the image of the wall and the tiles. Supposing we drew a set of vertical lines on our wall 16 units apart. Our new rule will now correspond to the case where a tile can move anywhere we like, providing one of its edges touches a line.

In order to make these routines work in all three of the ST's graphics modes, I've had to make a few compromises in terms of speed. Because of this, the programs in this article should really be regarded as a framework which can be modified to suit individual needs.

The first thing we need to do is decide on the physical dimensions of the sprites used. A good size to start with is 32 points wide by 32 high. The basic technique we'll be utilising involves splitting our sprite manipulation between two separate subroutines. One routine – called *sprite* – will draw our object on the screen, and the other – *unsprite* – will remove it.

The task we want *sprite* to perform is to copy the rectangular block making up our object to an area of the screen at a specific set of coordinates, and at the same time save the current contents of this region somewhere safe in the ST's memory.

Each sprite we deal with will use a separate set of storage locations for this purpose. The information we will need to input to our routine will therefore be the x,y coordinates, the address of the sprite data and the section of memory we have allocated for our screen information.

We can further break down this procedure to:

- Use x and y to calculate where in screen memory our sprite should be drawn.
- Save this position for *unsprite* to use.
- Get a line of sprite data.
- Get the screen data underneath the new position of this line.
- Save this screen data in a safe place.
- Move the sprite data on to the screen.
- Repeat the last four steps for each of the 32 horizontal lines making up the sprite.

At the heart of this program lies a set of two nested loops. This can readily be expressed by the following lines of pseudocode.

```
FOR i=1 TO height
FOR j=1 TO width
(Get the piece of screen underneath
the sprite and put it somewhere out
of harm's way)
(Draw part of our sprite)
NEXT J
(Get writing position to the
next line of our rectangle)
NEXT I
```

Precisely how we implement this procedure in assembly language will largely depend on the size of the chunks we use to access our data.

The numerous options available to us include individual binary bits, bytes, words and longwords.

Since we are dealing with sprites 32 points wide, it makes sense to use longwords for this purpose, because these are also 32 bits in length. We will therefore need to work out the width of our sprite in terms of these units.

Another piece of information we will require is the horizontal offset, and this can be readily calculated using the offset routine from last month's article. The initialisation section will now look like the following routine:

```
init2   JSR setup
        MOVE.L #32,D0
        JSR offset
        LSR.W  #1,D1
        SUB.W  #1,D1
        MOVE.W D1,lcount
        MOVE.L D2,os
        RTS
```

Note that we've also called the *setup* ▷

ALGORITHMS AND PSEUDOCODE

In programming, be it machine code or otherwise, there are several ways to describe a program in simple terms or steps.

One of the most common is the flowchart or flow diagram. This involves drawing a series of boxes representing operations, tests, subroutines and so on. However, flowcharts soon grow out of proportion, and become difficult to follow. Besides which, constructs such as REPEAT ... UNTIL and WHILE ... WEND are difficult to differentiate clearly.

This is where the language of pseudocode comes to the rescue. Rather than attempting to illustrate the algorithm as a series of boxes, it uses a form of language not unlike Basic. Constructs appear as they would in the program – mixed with simple English to describe what is happening like:

```
Hell is a hot and fiery place
WHILE Hell remains hot
Say "The end is nigh"
WEND
```

This trivial example converts to:

```
10 HFO=1
20 WHILE HFO=1
30 PRINT "The end of the world is
nigh"
40 WEND
```

There are no hard and fast rules in pseudocode. The object is to explain the algorithm in the simplest terms possible.

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◁ function to work out the graphics mode and find the location of the screen. We're now ready to write the main sprite routine alongside.

This expects registers D0 and D1 to contain the new x,y coordinates of our sprite, and A1 and A2 to hold the location of the data *cross* and the save area *safe* respectively.

As a side effect *sprite* alters registers D0 and D1 so these should be saved before use.

The first few lines of code simply take the new position of the sprite in D0 and

```
sprite   JSR conv
         MOVE.L A0,(A2)+
         MOVE.W #31,D0
copy     MOVE.W lcount,D1
putline  MOVE.L (A0),(A2)+
put      MOVE.L (A1)+,(A0)+
         DBRA   D1,putline
         ADD.L  OS,A0
         DBRA   D0,copy
         RTS
```

D1 and use *convert* to translate this into the location of the corresponding area on the screen.

This information is then saved at the beginning of *safe*, to avoid the necessity of recalculating our position every time we execute *unsprite*.

The sprite can now be moved into place using the two nested DBRA loops at *copy* and *putline*.

In many respects *unsprite* is just a simpler version of *sprite*. All this has to do is to remove the sprite by placing the old ▷

```
REM Sprite demonstration program
REM by Stephen Hill
REM (c) Atari ST User
REM Fast Basic


RESERVE space,2000
FOR PASS=0 TO 2
[OPT PASS,'L-W-'
ORG space
init2    JSR setup          \Call setup
         MOVE.L #32,D0      \D0=sprite width
         JSR offset         \Get horizontal
         LSR.W  #1,D1       \D1=INT(size/2)-1
         SUB.W  #1,D1       \Number words/group
         MOVE.W D1,lcount   \lcount=INT(size/2)-1
         MOVE.L D2,os       \Save Offset in os
         RTS


sprite   JSR conv           \Take X,Y from D0,D1
         MOVE.L A0,(A2)+    \Save screen safe area
         MOVE.W #31,D0      \D0=height-1
copy     MOVE.W lcount,D1   \D1=line length
putline  MOVE.L (A0),(A2)+  \Save screen in safe
put      MOVE.L (A1)+,(A0)+ \Move sprite to screen
         DBRA   D1,putline  \IF D1>=0 GOTO putline
         ADD.L  os,A0       \Add Offset in os to A0
                            \point to next line
         DBRA   D0,copy     \IF D0>=0 GOTO copy
         RTS


unsprite MOVE.L (A0)+,A1    \Get sprite location
         MOVE.W #31,D0      \D0=height-1
old      MOVE.W lcount,D1   \D1=line length
uncopy   MOVE.L (A0)+,(A1)+ \Copy back screen
         DBRA   D1,uncopy   \IF D1>=0 GOTO uncopy
         ADD.L  os,A1       \A1=A1+os
nextline DBRA   D0,old      \IF D0>=0 GOTO old
         RTS


emulate  MOVE.W #63,D0      \D0=number of groups
expand   MOVE.W lcount,D1   \D1=lcount
group    MOVE.W (A0),(A1)+  \Copy sprite data
         DBRA D1,group      \Into next group
         ADD.L  #2,A0       \Next sprite data
         DBRA   D0,expand   \Until no more
         RTS


setup    JSR getrez
         MOVE #3,D1
         SUB.W D0,D1
         MOVE.W D1,size
         CMP.W #2,D0
         BNE col
         MOVE.W #80,scanlen
col      JSR findscr
         MOVE.L D0,screen
         RTS
getrez   MOVE.W #4,-(A7)
         TRAP #14
         ADD.L #2,A7
         RTS

findscr  MOVE.W #2,-(A7)
         TRAP #14
         ADD.L #2,A7
         RTS

conv     MOVE.L D0,D6
         AND.L #15,D0
         LSR.W #4,D6
         MOVE.W size,D7
         LSL.W D7,D6
         MULU scanlen,D1
         ADD.L screen,D1
         ADD.L D6,D1
         MOVE.L D1,A0
         RTS

offset   MOVE.L D0,D1
         AND.W #15,D0
         MOVE.W size,D6
         LSR.W D6,D1
         MOVE.W scanlen,D2
         SUB.W D1,D2
         LSR.W #1,D1
         RTS
even

scanlen  DC.W 160       \Length of line in bytes
size     DS.W 1,0       \Variable needed for conv
screen   DS.L 1,0       \Space screen location
os       DS.L 1,0       \Space for Offset
lcount   DS.W 1,0       \Space for lcount
safe     DS.L 129,0     \Plenty of space
newcross DS.L 129,0     \Spare space for Emulate

\* Sample sprite data for monochrome monitors *\

cross    DC.L $18000,$3C000,$3C000,$3C000
         DC.L $3C000,$3C000,$3C000,$3C000
         DC.L $3C000,$3C000,$3C000,$3C000
         DC.L $3C000,$3C000,$7FFFFFFE,$FFFFFFFF
         DC.L $FFFFFFFF,$7FFFFFFE,$3C000,$3C000
         DC.L $3C000,$3C000,$3C000,$3C000
         DC.L $3C000,$3C000,$3C000,$3C000
         DC.L $3C000,$3C000,$3C000,$18000
]
NEXT

A0=cross
A2=safe
D0=10
D1=10
CALL init2
CALL sprite
G=GET
A0=safe
CALL unsprite
** N *
```

◁ contents of the screen back where they started from:

```
unsprite MOVE.L (A0)+,A1
         MOVE.W #31,D0
old      MOVE.W !count,D1
uncopy   MOVE.L (A0)+,(A1)+
         DBRA   D1,uncopy
         ADD.L  os,A1
         DBRA   D0,old
         RTS
```

Before *unsprite* can be used, you should remember to load A0 with the address of the old screen data.

One serious problem with this program is that it needs a different set of sprite data for each graphics mode you use it with. This means if you don't have a mono monitor, the data included with the example at *cross* simply won't look anything like a cross. The following routine – *emulate* – automatically converts this into the correct format.

If it looks a little complicated, don't worry. All you need to know in order to use it is that the converted sprites use colour 0 as the background, and either 3 or 15 for the sprite depending on whether the ST is in medium or low resolution:

```
emulate  MOVE.W #63,D0
xpand    MOVE.W !count,D1
group    MOVE.W (A0)+,(A1)+
         DBRA D1,group
         ADD.L #2,A0
         DBRA D0,xpand
         RTS
```

This expects the address of the monochrome sprite – *cross* – to be held in A0, and the location of its expanded copy *newcross* in A1. The new version of the sprite *newcross* should now be used instead of the old.

We'll conclude this article with a simple step by step guide to using sprites in your own programs:

- ☐ Call the initialisation routine at *init2*. If you have a colour monitor and are using two colour sprites, *emulate* should be called once for each sprite in your program:

```
MOVE.L #cross,A0
MOVE.L #newcross,A1
JSR emulate
```

- ☐ Draw each sprite on the screen using *sprite*, saving the coordinates first.
- ☐ Change the x,y coordinates of the sprite.
- ☐ Remove sprite at old position using *unsprite*.
- ☐ Redraw sprite at x,y using *sprite*.
- ☐ Repeat the last three steps for every sprite you wish to move.

Program 1, written in Fast Basic, is a simple example putting these techniques into action to show what can be done. As an experiment, try animating the sprite yourself.

● *Next month we'll stay with sprites and investigate ways to merge them together using logical operators.*

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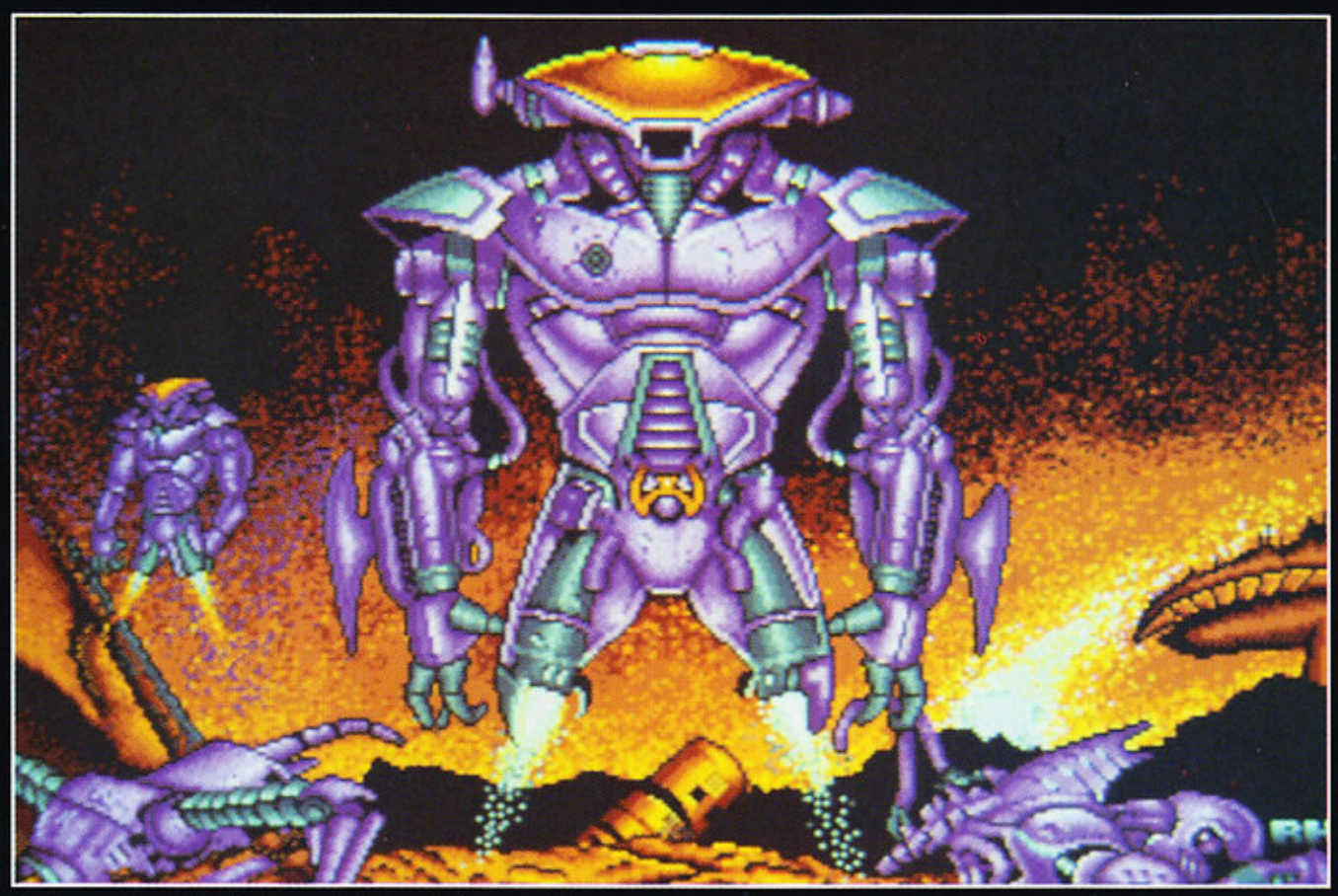

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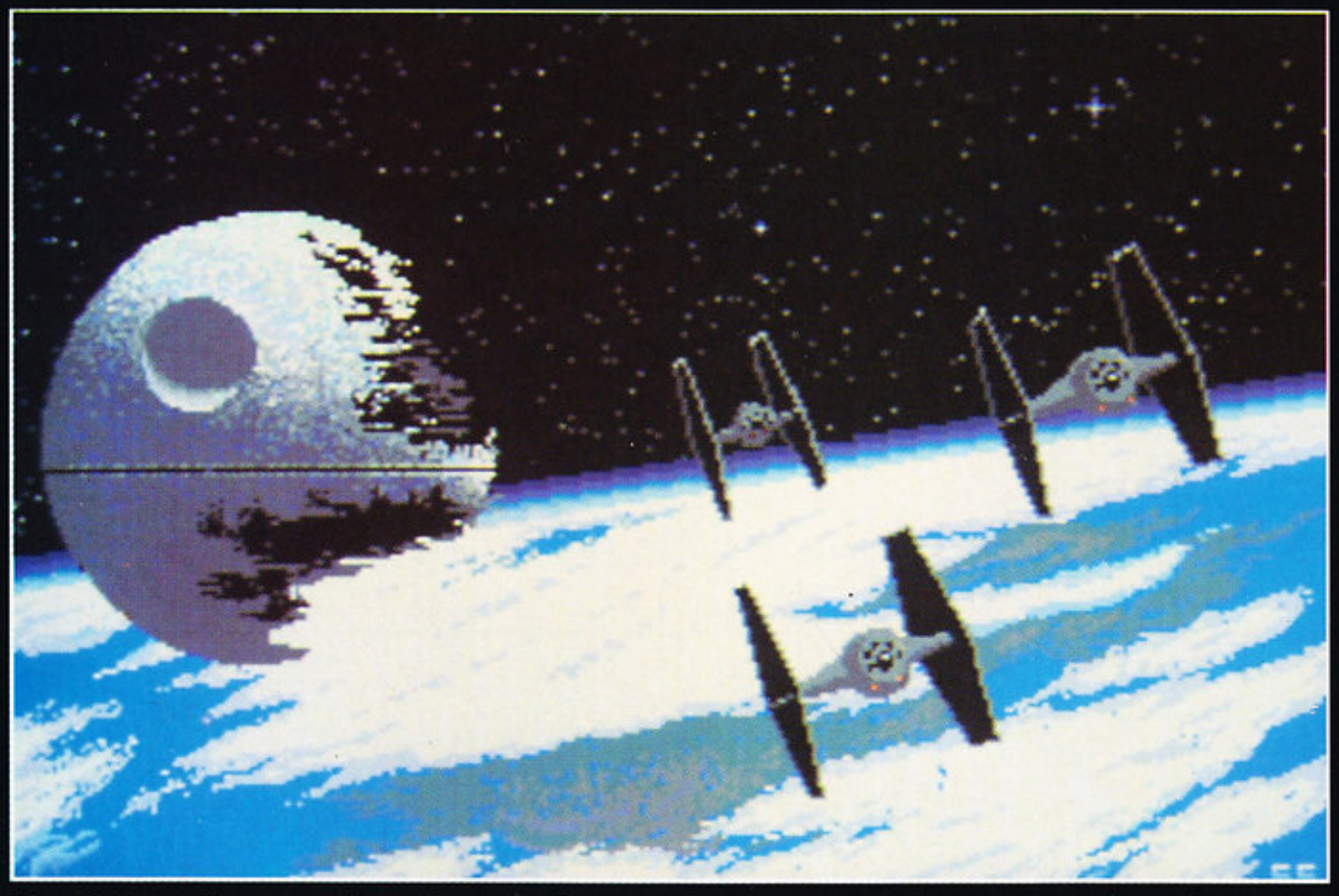

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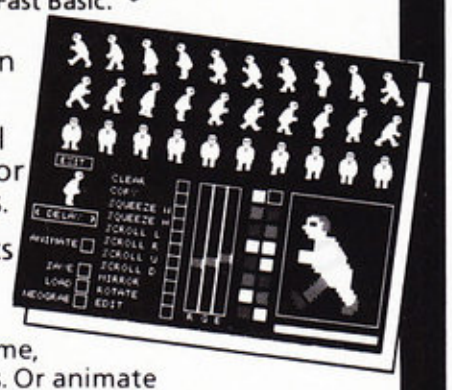

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VISA

Putting into port

In the final Part of his DIY user port series, Andrew Donald shows how to input data

IN the December 1987 issue of *Atari ST User* I presented a DIY user port. This flexible and powerful add-on provides the ST with an additional printer port and a means of controlling external hardware.

It is designed to provide the same facilities as the BBC Micro and can be used with many user port hardware add-ons built for that machine – provided any software necessary is rewritten. It is true to say that it opens up a whole new world of ST interfacing.

Last month we developed the software required to use the user port as an output port and now we will consider the operation of the port for input. For this we will require some new machine code routines.

The only piece of technical information we require over and above that which applied to the output mode of operation is that the printer port is switched to input via bit seven of the YM 2149 sound chip's register seven.

The default value of this bit is one, which sets the port as an output. Clearing this will switch the port byte lines to input. In addition to routines to control the handshake lines, we need to switch the port on and off, and to read a byte. Please note that the codes given here should not be mixed with the output routines previously given.

The hardware plugged into the user port will be designed either for input or output. You should not run output routines to input hardware or vice versa. That sort of thing can cause chips to start frying!

The 68000 machine code input routines given in Listing I allow complete control of the user port. The routines *STROFF* and *STRON* toggle the output handshake line OUT. They are identical to last month's output routines.

IPOFF and *IPON* turn the user port off and on respectively. They differ from the previously given routines *OPOFF* and *OPON* in that they also control the data direction.

Ensure they are always used in pairs so as to not leave the port in an input condition. Its default state is as an output port. Leave it that way after use. Pay particular attention to this point in a situation where it is possible to break out of a program. You should provide some sort of trap to provide an *IPOFF*.

The next routine – *UPRD* – will read the input lines and return the byte value in the lower half of the D0 register.

Finally *UPST* is identical to the previously given output routine *UPST*. It will return the status of the input handshake line IN, in D0. Zero incates IN is high and –1 that it is low.

Considering the implimentation of these routines in other languages, Table I shows the C routines equivalent to the assembly language instructions.

Implementation these in Fast Basic is very simple. Assemble the machine code as given into a reserved space. Use the Fast Basic variable D0 to read the values after a call to those routines which return a value. For instance:

```
CALL IPRD
PRINT~D0
```

will read the port and print the returned byte – assuming the port has been turned on, of course.

In spite of my unhappiness with ST Basic as a language, it is the one language to which every ST owner has access. It is necessary, therefore, to give a method of utilising the user port for input from that language.

Program I will poke the machine code routines into reserved memory, then make them available. In your own programs, include lines 10–160 to initialise the routines and then simply make the calls to them as demonstrated in lines 180–270 of Program I.

The machine code routines differ slightly from those in Listing I, in that the variable *data%*, has been linked into them.

I was unable to work the parameter passing mechanism described in the ST Basic manual, so set up this method as an alternative.

When run, the program switches on the user port for input, then reads and prints out the port value. The lines may be tested by holding a wire from ground to each of the port input lines in turn. The printed value will show the bit going low, while all the other lines will be read as ▷

Machine code	C
STROFF	ongibit(0xDF)
STRON	ongibit(0x20)
IPOFF	giaccess(data, 0x7); giaccess(data&0x80, 0x87); offgibit(0x7F)
IPON	giaccess(data, 0x7); giaccess(data&0x7F, 0x87); ongibit(0x80)
UPRD	giaccess(0, 0xF)
UPST	gemdos(0x11); or Cpmos()

Table I. Operating the user port from C

```
\ Listing I
\ Routines for reading from the user port
\ by Andrew Donald

STROFF  MOVE.W #$DF,-(SP)  \OUT strobe low
        BRA.S offg         \XBIOS fn 29 (offgibit)
STRON   MOVE.W #$20,-(SP)  \OUT strobe high
        BRA.S ong          \XBIOS fn 30 (ongibit)
IPOFF   BSR.S wr7o         \Port B as output
        MOVE.W #$7f,-(SP)  \User Port off
offg    MOVE.W #29,-(SP)   \XBIOS fn 29
        BRA.S xb4          \(offgibit)
IPON    BSR.S wr7i         \Port B as input
        MOVE.W #$80,-(SP)  \User Port on
ong     MOVE.W #30,-(SP)   \XBIOS fn 30
xb4     TRAP #14           \(offgibit)
        ADDQ.L #4,SP       \Adjust stack
        RTS                \and return.

wr7o    BSR.S rd7          \Read reg 7
        BSET #7,D0         \Set Port B for output
        BRA.S wr7

wr7i    BSR.S rd7          \Read reg 7
        BCLR #7,D0         \Set Port B for input
wr7     MOVE.W #$87,-(SP)  \Write reg 7
        BRA.S wr

rd7     MOVE.W #7,-(SP)    \Read reg 7
wr      MOVE.W D0,-(SP)    \write data
        MOVE.W #28,-(SP)   \fn 28 (giaccess)
xb6     TRAP #14           \of XBIOS
        ADDQ.L #6,SP       \Adjust stack
        RTS                \and return.

UPRD    MOVE.W #15,-(SP)   \Read Port B (reg 15)
        CLR.W -(SP)
        MOVE.W #28,-(SP)   \fn 28 (giaccess)
        BRA.S xb6          \of XBIOS.

UPST    MOVE.W #17,-(SP)   \PRT status via fn 17
        TRAP #1            \of GEMDOS
        ADDQ.L #2,SP       \Adjust stack
        RTS                \Return status
```

highs. This program terminates when the handshake line IN is low.

This article concludes the ST user port project. A further series of projects is planned which will make use of the extra facilities. The port is as versatile as the user port provided on the BBC Micro and that has been used used for many and various applications. If you have a specific application which you would like to see implimented then write in and let us know.

Some final points: It should be noted that since the switching circuitry is CMOS, some care needs to be given to the design of TTL logic circuits going on to the port.

The CMOS outputs are capable of driving one TTL gate. If you wish to drive more than one gate off an output, then it will be necessary to use buffer/line driver gates on the user port lines. Suitable chips are the 74LS367 and 74LS244.

The inclusion of buffers was considered in the original design, but the direction of the buffers is dependent on whether the lines are being used for input or output. It is easier to put the buffers, when necessary, into the add-on hardware where this decision has been resolved.

A last warning about mixing the input and output routines. It is your responsibility to ensure the hardware on the user port is compatible with the routines being used. It is possible to use the port in mixed input/output mode, but only if both the hardware and software have been designed specifically for this purpose.

● *Well, that's the end of the series. Let us know how you get on and tell us of any interesting projects you have devised using the user port.*

```
10 ' User port machine code input
11 ' routines in ST Basic
12 ' By Andrew Donald
13 ' (c) Atari St User
20 DATA 3F,3C,00,0F,60,0C,3F,3C,00,20
,60,12,61,1A,3F,3C
30 DATA 00,7F,3F,3C,00,10,60,0A,61,16
,3F,3C,00,80,3F,3C
40 DATA 00,1E,4E,4E,58,8F,4E,75,61,12
,08,C0,00,07,60,D6
50 DATA 61,0A,08,80,00,07,3F,3C,00,87
,60,D4,3F,3C,00,07
60 DATA 3F,00,3F,3C,00,1C,4E,4E,5C,8F
,4E,75,61,D2,60,14
70 DATA 3F,3C,00,0F,42,67,3F,3C,00,1C
,60,EA,3F,3C,00,11
80 DATA 4E,41,54,8F,33,C0,00,00,00,00
,4E,75,00,00,00,00
98 '
100 clear:def seg=1:c$=space$(112):i#
=varptr(c$)
110 STROFF#=i#:STRON#=i#+6:IPOFF#=i#+
12
120 IPON#=i#+24:UPRD#=i#+76:UPST#=i#+
92
130 s#=0:for j#=i# to i#+109:read a$:
a%=val("&h"+a$)
140 s#=s#+a%:poke j#-1,a%:next:def se
g=0
150 if s#<>6372 then print"DATA ERROR
":end
160 data%=0:j#=varptr(data%):poke i#+
102,j#
170 '
180 ' Test Program - Reads input line
s until IN low
190 call IPON# ' Input User Port on
200 while not(data%) ' while IN high
210 call UPRD# ' Read User Port
220 print hex$(data%) ' print data
230 call UPST# ' Get the status
240 wend ' and again
250 call IPOFF# ' Input User Port off
260 ' call STRON# puts strobe line 0U
T, high
270 ' call STROFF# puts it low.
280 end
```


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This month Atari ST User is two years old. To mark the occasion we've put together a very special competition.

The first prize is the highly acclaimed Pro-24 and MasterScore software from Steinberg Research/Evenlode Soundworks together with a fabulous Yamaha TX81Z 8-note polyphonic multi-timbral tone generator.

The professional software, as used by such luminaries as Guy Fletcher of Dire Straits and Mark Kelly of Marillion, is worth £610, and the Yamaha synthesiser module £449 – bringing the total value of the first prize to £1,059!

But that's not all. There's also 20 copies of Tynesoft's action-packed Winter Olympiad for the runners-up.

The TX81Z, an eight-note polyphonic tone generator, can act as up to eight independent instruments. It uses the same FM synthesis technology that made the Yamaha DX series famous, allowing you to produce an infinite range of sounds from acoustic-sounding voices to outrageous sound effects. There are 128 factory presets, and 32 user voice memories for storing totally new voices that you create. Operation is via a two-line 16 character LCD display, and there's a pull-out operation guide built into the unit for quick reference.

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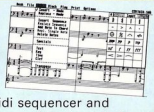
All you have to do is answer the questions, complete the tiebreaker in not more than 25 words, fill in the coupon and send it to the address below to arrive no later than March 31, 1988. The senders of the first correct entries will be pooled and the person with the most interesting or entertaining tiebreaker will win the first prize. The senders of the next best 20 entries will receive a copy of Winter Olympiad.

THE QUESTIONS

1 On how many channels can Midi transmit information simultaneously?

2 What was so special about 1987 for Yamaha?

3 Which well-known synthesiser player composed the music for the film Bladerunner?



Pro-24 is an advanced Midi sequencer and processor which allows you to input musical information in either real-time or step-time and then edit every nuance of every note or event.

MasterScore is a powerful music notation program for outputing Pro-24 files in traditional notation to a printer. You can add all the main musical symbols, and there's even a text editor so you can incorporate lyrics and musical instructions into your score.

NB: You will need 1Mb of memory to run this software. Pro-24 will work in colour, but MasterScore requires a monochrome monitor.

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Answers

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3 _____

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23/3/88

All the colours of the rainbow

Russell Payne's utility adds extra colour to your ST

ALTHOUGH the ST has a massive 512 colour palette, the actual number of colours you can display on the screen at any one time is in practice, restricted. The maximum is 16 in low resolution and four in medium resolution. The utility presented here shows how you can substantially increase these numbers, making your graphic displays far more colourful and attractive.

When Atari designed the ST it included several unique chips of its own, based on uncommitted logic arrays (ULAs). One of these, known as Glue, generates several signals specially for video operations.

The most useful for our purposes are Vsync and Hsync which correspond to vertical and horizontal picture synchronization respectively. Both of these signals generate interrupts as they occur.

The horizontal blank generates a level two interrupt vectoring through location $68. The vertical blank generates a level four interrupt vectoring through location $70. By intercepting these and inserting a machine code subroutine it is possible to coordinate colour changes to occur on-the-fly: That is, as the picture is being redrawn.

In this way, the limit of 16 colours in low resolution and four in medium resolution can be overcome – allowing all 512 colours to be displayed at once. This is achieved by changing the colour palette on certain horizontal scanlines. In medium and low resolution the ST screen consists of 200 scanlines.

The colour palette is stored in a 16-word block of memory that is read by the hardware colour registers when making up the monitor or TV picture. The first word in the block represents colour zero – normally white – the second colour one and so on through to colour 15. Medium resolution only reads the first four words.

The colour registers themselves are located at even addresses starting at location $FF825E with colour zero and finishing at location $FF8240 with colour 15. The hardware reads groups of three bits when making up a colour as illustrated in Figure I. Colour white is therefore 0000 0111 0111 0111 or $777. So to change the background to black in ST Basic type:

```
POKE &HFF8240,0
```

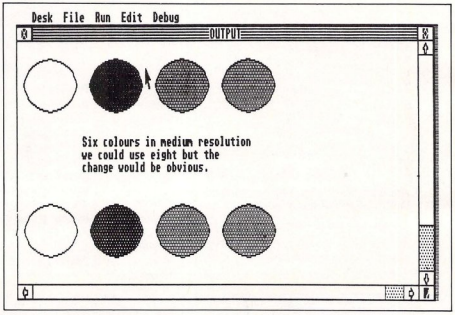

Figure II: A split palette screen

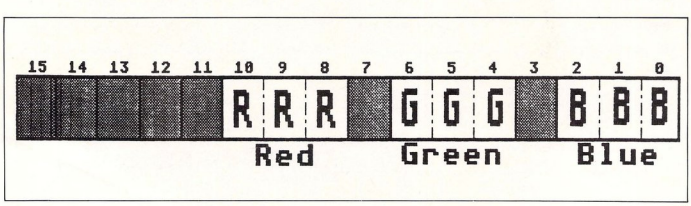

Figure I: The layout of the ST's palette register

and to change it to red type:

```
POKE &HFF8248,&H700
```

Program I is a demonstration written in ST Basic. It's output can be seen in Figures II and III. When run, the subroutine *initialise* – from line 10000 onwards – pokes a machine code program into memory to install new Hblank and Vblank routines. To use this subroutine in your own programs it is only necessary to enter these lines and call the routine with:

```
CALL colourmap(N,VARPTR(palette%(0,0)))
```

where *N* is the number of screen lines before the next change. The number of visible palettes is therefore (200/*N*)+1. *Palette%(1,1)* is a two dimensional array of colours, *I* is the palette number and *J* the colour index.

To remove the palettes from display use:

```
CALL unmap
```

It is vital not to call *colourmap* more than once without first calling *unmap* to restore the original vectors. The result of 200/*N* must be an even number, otherwise the position of the switch will tend to roll up the screen. □

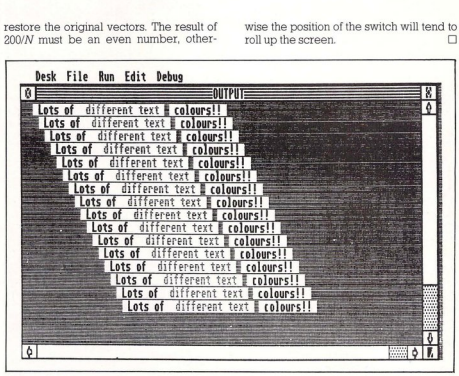

Figure III: A split palette screen with 50 splits

```
   10 REM Multi-colour demonstration p
rogram
   20 REM By Russell Payne
   30 REM (c) Atari ST User
   40 REM Low or Medium rez only
   50 REM
   60 DEF FNc(x)=(PEEK(1212)*4+x) AND
&H777
   70 DEFSEG=0:DEFINT i,j:CLEAR:POKE 1
212,0
   80 DIM palette%(50,15):FULLW 2:CLEA
RW 2:GOSUB initialise
   90 REM
  100 DATA &H777,&H700,&H070,&H000
  110 DATA &H777,&H007,&H707,&H000
  120 RESTORE 100
  130 REM
  140 READ palette%(0,0),palette%(0,1)
,palette%(0,2),palette%(0,3)
  150 READ palette%(1,0),palette%(1,1)
,palette%(1,2),palette%(1,3)
  160 FOR i=0 TO 3:palette%(2,i)=palet
te%(1,i):NEXT:REM fix bottom palette
  170 CALL colourmap(100,VARPTR(palett
e%(0,0))):REM 200/100=2
  180 FOR i=0 TO 3
  190 FOR j=30 TO 130 step 100
  200 COLOR 1,1,1,1,1:circle i*100+50,
j,40,40
  210 COLOR 1,1,1,7,2:fill i*100+50,j
  220 NEXT
  230 NEXT
  240 COLOR 1,1,1,1,1
  250 GOTOXY 10,7:?" Six colours in me
dium resolution"
  260 GOTOXY 10,8:?" we could use eigh
t but the"
  270 GOTOXY 10,9:?" change would be o
bvious."
  280 FOR i=1 TO 90000:NEXT:CLEARW 2:C
ALL unmap
  290 FOR i=0 TO 50
  300 palette%(i,0)=&H777:REM white
  310 palette%(i,1)=FNc(i)
  320 palette%(i,2)=&H700:REM red
  330 palette%(i,3)=&H000:REM black
  340 NEXT
  350 CALL colourmap(4,VARPTR(palette%
(0,0))):REM 200/4=50
  360 COLOR 1,3,1,8,2:fill 10,10
  370 FOR i=0 TO 15
  380 COLOR 1,1,1,1,1:GOTOXY 2+i,i:?"
Lots of "
  390 COLOR 2,1,1,1,1:GOTOXY 10+i,i:?"
different text "
  400 COLOR 1,1,1,1,1:GOTOXY 25+i,i:?"
colours"
  410 NEXT
  420 COLOR 1,2,1,1:PCIRCLE 60,120,40,
40
  430 COLOR 1,2,1,1:PCIRCLE 400,30,40,
40
  440 REM
  450 i=1:j=24:k=0
  460 palette%(i,1)=palette%(i+1,1)
  470 palette%(49-j,2)=palette%(50-j,2
):palette%(j,2)=palette%(j-1,2)
  480 i=i+1:if i=49 THEN palette%(49,1
)=FNc(k):i=1
  490 j=j-1:if j=0 THEN palette%(1,2)=
FNc(k):palette%(49,2)=FNc(k):j=24
  500 k=k+1:if k<1200 THEN 520
  510 REM
  520 CLEARW 2:CALL unmap
  530 END
10000 REM Colour pallette routine inti
alize machine code
10010 initialise:
10020 DEFSEG=0:colourmap=PEEK(1102#)+&
H7b12:mc=colourmap
10030 UNMAP=colourmap+&H7A:chksum=0:RE
STORE 10100:READ a$
10040 WHILE a$<>"*"
10050 x=VAL("&H"+a$):POKE mc,x:mc=mc+2
:chksum=chksum XOR x:READ a$
10060 WEND
10070 IF chksum<>9574 THEN ?"Checksum
failed":STOP
10080 RETURN
10090 REM
10100 DATA 206f,0006,43FA,00FA,32E8,00
02,2068,0004,22C8,41E8,0020,22C8
10110 DATA 487A,000C,3F3C,0026,4E4E,5C
8F,4E75,46FC,2700,2038,0070,41FA
10120 DATA 00CA,2140,0002,41FA,00B6,21
C8,0070,41FA,00BA,21C8,0120,4238
10130 DATA FA1B,5B3A,00B4,11C8,FA21,B0
38,FA21,66F6,B8F8,0000,FA07,B8F8
10140 DATA 0000,FA13,46FC,2300,2038,04
66,B0B8,0466,67FA,11FC,0008,FA1B
10150 DATA 4E75,487A,000C,3F3C,0026,4E
4E,5C8F,4E75,4238,FA1B,41FA,006C
10160 DATA 2068,0002,21C8,0070,4E75,2F
08,2078,0300,31D8,8240,31D8,8242
10170 DATA 31D8,8244,31D8,8246,31D8,82
48,31D8,824A,31D8,824C,31D8,824E
10180 DATA 31D8,8250,31D8,8252,31D8,82
54,31D8,8256,31D8,8258,31D8,825A
10190 DATA 31D8,825C,31D8,825E,21C8,03
00,205F,08B8,0000,FA0F,4E73,21FA
10200 DATA 0012,045A,21FA,0010,0300,4E
F9,0000,0000,0000,0000,0000,0000
10210 DATA 0000,*
```

Program I

SOFTWARE GEMS

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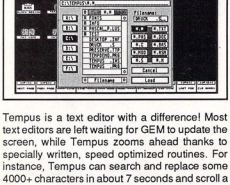

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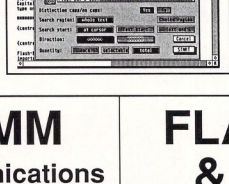

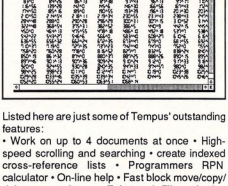

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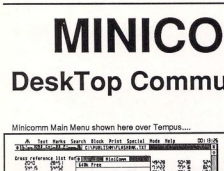

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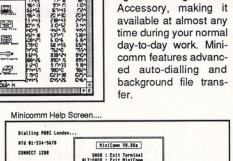

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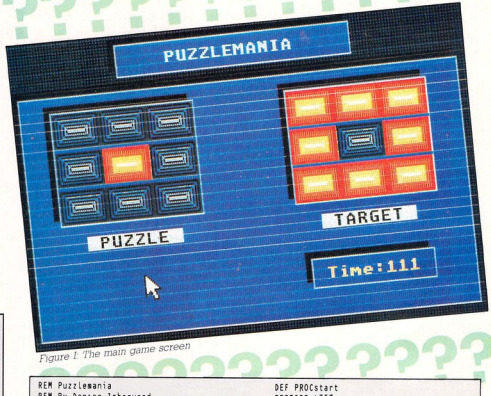

Figure 1: The main game screen

PUZZLEMANIA is a simple, yet mind-boggling puzzle designed to test your powers of logic to the full. This one-player game written in Fast Basic is based on the three by three grid shown in Figure 1 where you'll see two separate patterns.

The one on the left is the puzzle grid at the start of the game and the one on the right is the target. The object of the exercise is to turn the puzzle into the target, by flipping the squares of the grid changing red to blue and blue to red.

Using the mouse, point at one of the blue squares in the puzzle and click the left-hand button. Certain squares will be flipped from blue to red according to a set of rules laid out by the program.

The corners flip a block of four corner squares while the middle square in each side flips that whole side. The central square flips the central cross of squares.

It may sound complicated, but it is simpler than you might think. The best way to learn the rules is to point the mouse and click the button, watching what happens. Remember though, you can only point at a blue square.

Once you have solved this first puzzle – within the time limit shown on the screen – you'll be presented with another. There are eight in all and the amount of time you have to complete each one decreases with each puzzle successfully completed.

If, by chance, you turn all the squares to red there won't be any blue squares left to point at and flip. You then won't be able to go so you'll have failed. Be careful: This is quite easy to do without realising it. However, you will be asked if you want to try to solve the puzzles again.

```
REM Puzzlemania
REM By Denise Isherwood
REM (c) Atari ST User
REM Fast Basic

PROCassemble
PROCinitialise
PROCscreen
puzzle=0
box%=16
T%=13000
REPEAT
PROCstart
REPEAT
PROCkey
UNTIL box%=target% OR TIME>T% OR  box%=511
BEEP
FOR delay=1 TO 20000:NEXT
IF box%=511 OR TIME>T% THEN
 A%=ALERT(1,"[1][ You have I failed][Oops!]",1)
 box%=511
ELSE
 A%=ALERT(1,"[1][ Well done! ][Ok]",1)
ENDIF
UNTIL puzzle=8 OR box%=511
A%=ALERT(1,"[1][ Try again? ][Yes|No]",1)
REPEAT:UNTIL INKEY$=""
IF A%>1 THEN END
RUN

DEF PROCkey
PROCtext(31,20,STR$((T%-TIME)DIV 100)+" ",7,8)
I%=0
REPEAT
B%=0:MOUSE X%,Y%,B%,K%
I%=I%+1
UNTIL (B% AND 1>0) OR I%=100
IF (B% AND 1)=0 THEN ENDPROC
X%=(X%-27)/33
Y%=(Y%-45)/27
IF X%<0 OR X%>2 OR Y%<0 OR Y%>2 THEN ENDPROC
K%=X%+Y%*3
IF (box% AND 2^(8-K%))>0 THEN ENDPROC
box%=box% EOR rule%(K%)
BEEP
HIDEMOUSE
PROCdisplay(box%,16,50)
SHOWMOUSE
ENDPROC

DEF PROCstart
RESTORE L350
FOR I%=0 TO puzzle
READ target%
NEXT
L350:
DATA 495,186,341,186,381,471,146,325
puzzle=puzzle+1
T%=T%-1000
HIDEMOUSE
PROCdisplay(box%,16,50)
PROCdisplay(target%,96,50)
SHOWMOUSE
PROCtext(21,22,STRING$(16," "),8,8)
t$="[1][Puzzle "+" "+STR$(puzzle)+"][Ok]"
A%=ALERT(1,t$,1)
TIME=0
ENDPROC

DEF PROCinitialise
DIM rule%(8)
RESTORE L800
FOR i=0 TO 8:READ rule%(i):NEXT
L800:
DATA 432,448,216,292,186,73,54,7,27
ENDPROC

DEF PROCscreen
HIDEMOUSE
CALL setpal
TXTRECT 0,0,320,200
GRAFRECT 0,0,320,200
CLS
FILLCOL 8
FILLSTYLE 2,2
RECT 0,0,319,199
LINECOL 15
LINE 0,0 TO 0,199
LINE 0,199 TO 319,199
LINE 319,199 TO 319,0
LINE 319,0 TO 0,0
PROCwindow(75,6,168,20)
PROCtext(14,2,"PUZZLEMANIA",15,8)
PROCwindow(6,35,308,152)
PROCwindow(27,45,97,71)
PROCwindow(187,45,97,71)
PROCtext(6,16," PUZZLE ",0,15)
PROCtext(26,16," TARGET ",0,15)
PROCwindow(194,151,84,18)
```

```
PROCtext(26,20,Time:',7,8)
SHOWMOUSE
ENDPROC

DEF PROCtext(X%,Y%,t$,F%,BX)
FILLSTYLE 1,0
FILLCOL BX
RECT X%+8,Y%+8,X%+8+LEN(t$)*8,Y%+8+8
GRAFMODE 2
GTXTCOL F%
GTXT X%+8,Y%+8+7,t$
GRAFMODE 1
ENDPROC

DEF PROCwindow(X%,Y%,W%,H%)
FILLCOL 8
FILLSTYLE 0,0
RECT X%,Y%,X%+W%,Y%+H%
FILLSTYLE 1,0
FILLCOL 14
RECT X%+4,Y%+4,X%+W%+4,Y%+H%+4
FILLCOL 8
RECT X%+5,Y%+5,X%+W%+3,Y%+H%+3
ENDPROC

DEF PROCdisplay(BX,IX,JX)
FOR X%=0 TO 2
FOR Y%=0 TO 2
AB=PHYSBASE+IX+X%*16+16*(JX+Y%*24)
DB=(BX/2^(8-X%-Y%*3))AND 1
CALL code
NEXT
NEXT
ENDPROC

DEF PROCassemble
RESERVE code,2000
FOR pass=1 TO 2

[ OPT pass,"L-W-"
  ORG code
  LEA table,A1
  LSL.L #2,D0
  MOVEA.L 0(A1,D0),A1
  MOVE #21,D0
loop
  MOVE.L (A1)+,(A0)
  MOVE.L (A1)+,4(A0)
  MOVE.L (A1)+,8(A0)
  MOVE.L (A1)+,12(A0)
  ADDA.L #160,A0
  DBRA D0,loop
  RTS

setpal
  MOVE.L #pal,-(A7)
  MOVE #6,-(A7)
  TRAP #14
  ADDQ.L #6,A7
  RTS

table
  DC.L sprite0,sprite1

pal
  DC.W 0,1792,1824,1840,1858,1874,3,5
  DC.W 23,311,583,855,1383,1655,1910,$777

sprite0
  DC.W 0,65535,65535,0,0,65535,65535,0
  DC.W 0,49152,49152,0,0,3,3,0
  DC.W 16383,49151,49151,0,65532,65533,65533,0
  DC.W 12288,45056,45056,0,12,13,13,0
  DC.W 8192,40960,40960,4095,4,5,5,65520
  DC.W 8192,40960,40960,3072,4,5,5,48
  DC.W 9215,40960,40960,3071,65476,5,5,65488
  DC.W 8960,40960,40960,2816,196,5,5,208
  DC.W 8704,41215,40960,2815,68,65285,5,65360
  DC.W 8704,41152,40960,2752,68,773,5,848
  DC.W 8767,41151,40960,2751,64580,64773,5,64848
  DC.W 8767,41151,40960,2751,64580,64773,5,64848
  DC.W 8704,41152,40960,2752,68,773,5,848
  DC.W 8704,41215,40960,2815,68,65285,5,65360
  DC.W 8960,40960,40960,2816,196,5,5,208
  DC.W 9215,40960,40960,3071,65476,5,5,65488
  DC.W 8192,40960,40960,3072,4,5,5,48
  DC.W 8192,40960,40960,4095,4,5,5,65520
  DC.W 12288,45056,45056,0,12,13,13,0
  DC.W 16383,49151,49151,0,65532,65533,65533,0
  DC.W 0,49152,49152,0,0,3,3,0
  DC.W 0,65535,65535,0,0,65535,65535,0

sprite1
  DC.W 65535,0,0,0,65535,0,0,0
  DC.W 65535,0,0,0,65535,0,0,0
  DC.W 49152,16383,0,0,3,65532,0,0
  DC.W 49152,16383,0,0,3,65532,0,0
  DC.W 53247,16383,0,0,65523,65532,0,0
  DC.W 53247,16383,0,0,65523,65532,0,0
  DC.W 52224,15360,1023,0,51,60,65472,0
  DC.W 52224,15360,1023,0,51,60,65472,0
  DC.W 52479,15360,1023,0,65331,60,65472,0
  DC.W 52479,15360,1023,0,65331,60,65472,0
  DC.W 52416,15423,1023,63,819,64572,65472,64512
  DC.W 52416,15423,1023,63,819,64572,65472,64512
  DC.W 52479,15360,1023,0,65331,60,65472,0
  DC.W 52479,15360,1023,0,65331,60,65472,0
  DC.W 52224,15360,1023,0,51,60,65472,0
  DC.W 52224,15360,1023,0,51,60,65472,0
  DC.W 53247,16383,0,0,65523,65532,0,0
  DC.W 53247,16383,0,0,65523,65532,0,0
  DC.W 49152,16383,0,0,3,65532,0,0
  DC.W 49152,16383,0,0,3,65532,0,0
  DC.W 65535,0,0,0,65535,0,0,0
  DC.W 65535,0,0,0,65535,0,0,0
]
NEXT
ENDPROC
```


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SCRAP BOOK

SCRAPBOOK this month features an assembly language screen mode selector and a file scrambler/descrambler utility. Both are from Andrew Richards of Chester, Cheshire.

The first program – the mode selector – is written in assembly language using HiSoft's Devpac assembler/monitor package. It should be compiled to disc with the filename MEDLOW.PRG and placed in the AUTO folder of your boot-up disc.

When the ST is switched on or reset it will be loaded and run automatically. You will be prompted for the screen mode. Either press M for medium or L for low resolution colour (it shouldn't be used if booting up with a monochrome monitor). The appropriate screen mode will then be set and the ST will continue its boot-up sequence as normal and display the desktop.

The routine works by first printing the

```
* AUTO program to select medium
* or low resolution screen mode
* By Andrew Richards
* (c) Atari ST User

  PEA prompt(PC)    Print prompt
  MOVE.W #9,-(A7)
  TRAP #1           BDOS 9
  ADD.L #6,A7       Tidy stack
input
  MOVE.W #8,-(A7)   Wait for key
  TRAP #1           BDOS 8
  ADD.L #2,A7       Tidy stack
  AND.W #$DF,D0     Force upper case
  CMP.W #'L',D0     L pressed?
  BEQ low           Yes
  CMP.W #'M',D0     M pressed?
  BNE input         No - goto input
  MOVE.W #1,-(A7)   Set medium res.
  BRA exit          Skip next bit
low
  MOVE.W #0,-(A7)   Set low res.
exit
  MOVE.L #-1,-(A7)  Dummy parameter
  MOVE.L #-1,-(A7)  Dummy parameter
  MOVE.W #5,-(A7)
  TRAP #14          XBIOS 5
  ADD.L #12,A7      Tidy stack
  MOVE.W #0,-(A7)   Return to Desktop
  TRAP #1           BDOS 1

prompt
  DC.B '****************',13,10
  DC.B '*                *',13,10
  DC.B '* Medium or Low *',13,10
  DC.B '*  resolution?   *',13,10
  DC.B '*                *',13,10
  DC.B '* Press  M or L *',13,10
  DC.B '*                *',13,10
  DC.B '****************',13,10
  DC.B 0
  EVEN
  END
```

Program I

```
 10 REM Scrambler
 20 REM By Andrew Richards
 30 REM (c) Atari ST User
 40 REM Fast Basic
 50 REM Don't enter line numbers!
 60 TXTRECT 0,0,SCREENWIDTH,SCREENHEI
GHT
 70 CLS
 80 PRINT'Select file to scramble."
 90 filein$=FNselect_file
100 CLS
110 PRINT'Input new filename."
120 fileout$=FNselect_file
130 CLS
140 INPUT'Enter a number:'NX
150 PRINT
160 PRINT'Scrambling..."
170 NX=RND(-NX)
180 filein=OPENIN filein$
190 fileout=OPENOUT fileout$
200 REPEAT
210 byte%=BGET#filein
220 BPUT#fileout,byte% EOR RND(255)
230 UNTIL EOF#filein
240 CLOSE#filein
250 CLOSE#fileout
260 END
270
280 DEF FNselect_file
290 REPEAT
300 PATH$="A:\"
310 file$=PATH$+"*.*"
320 name$=""
330 button=0
340 FSELECT file$,name$,button
350 UNTIL button=0 OR name$>""
360 WHILE RIGHT$(file$,1)<>"\"
370 file$=LEFT$(file$,LEN(file$)-1)
380 WEND
390 PATH$=file$
400 =name$
```

Program II

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.

If you have a short program which you think other readers would find useful, send it to:

Scrapbook, Atari ST User, Europa House, Adlington Park, Adlington, Macclesfield, Cheshire SK10 5NP.

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prompt using Bdos function nine, c_conws; then waiting for a keypress using Bdos function eight, c_necin, making sure it is either L or M.

XBios function five, _setscreen, is finally used to set the screen resolution. This will also set the logical and physical screen memory locations so dummy negative parameters are passed to indicate they are to be ignored.

Our second Scrapbook utility is in two parts – the first is a file scrambler, which as its name suggests scrambles the contents of a file, and the second is an unscrambler, which will restore the file to its original state.

This can be used to make the contents of files on disc secure from unauthorised eyes. If you have confidential information on your discs which you don't wish other people to see, this utility will scramble the contents making it unreadable.

The programs are written in Computer Concepts' Fast Basic and the listings should be entered without the line numbers. The first listing will display a file selector box and prompt you for a file to scramble. Select a file and you'll then be prompted for another filename.

Finally you'll be asked to input a number. Almost any positive integer up to a couple of million will do. This is used to seed Fast Basic's random number generator which then produces a series of pseudo-random numbers to exclusively or the data – each byte is EORed with a different random number.

The original file is left untouched for safety and a scrambled copy is made with the new filename. Go back to the desktop afterwards and delete the original file.

The second part of this utility will unscramble the file – providing you enter the same number used when scrambling it.

```
 10 REM Unscrambler
 20 REM By Andrew Richards
 30 REM (c) Atari ST User
 40 REM Fast Basic
 50 REM Don't enter line numbers!
 60 TXTRECT 0,0,SCREENWIDTH,SCREENHEI
GHT
 70 CLS
 80 PRINT"Select file to unscramble."
 90 filein$=FNselect_file
100 CLS
110 PRINT"Input new filename."
120 fileout$=FNselect_file
130 CLS
140 INPUT"Enter a number:"N%
150 PRINT
160 PRINT"Unscrambling."
170 N%=RND(-N%)
180 filein=OPENIN filein$
190 fileout=OPENOUT fileout$
200 REPEAT
210 byte%=BGET#filein EOR RND(255)
220 BPUT#fileout,byte%
230 UNTIL EOF#filein
240 CLOSE#filein
250 CLOSE#fileout
260 END
270
280 DEF FNselect_file
290 REPEAT
300 PATH$="A:\"
310 file$=PATH$+"*.*"
320 name$=""
330 button=0
340 FSELECT file$,name$,button
350 UNTIL button=0 OR name$>""
360 WHILE RIGHT$(file$,1)<>"\"
370 file$=LEFT$(file$,LEN(file$)-1)
380 WEND
390 PATH$=file$
400 =name$
**N**
```

Program III

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ACCESS VISA

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Martyn Dryden shows how to create your own accessory selector

ONE of the most powerful features of the Gem desktop is its ability to run up to six small background tasks known as desk accessories in addition to the main application.

Accessories often take the form of utilities such as calculators, memory editors, printer selectors and even spelling checkers. Each is held in a separate section of memory known as a slot.

Six slots are maintained in a buffer set up by the application environment services (AES). At any one time therefore, up to six accessories can be available from the desk menu.

When the computer is booted the default drive, normally A is searched for files with the .ACC extender. These are loaded after Gem has been initialised, but before the desktop has appeared.

If a lot of accessories are present, the desktop takes longer to appear. The time is dependant on the length and number of the accessories concerned.

In a perfect world there would only be six accessories. However, since they're so useful and relatively straightforward to implement (you'll find one in the October 1987 issue of *Atari ST User*) many software houses have produced their own. There's also a large selection in the public domain.

It is therefore quite possible to have more than 40 accessories on a single boot disc, but Gem will only load the first six it finds.

To complicate matters still further, some accessories take up more than one slot – Atari's control panel/install printer and VT52 emulator/RS232 configure are typical cases.

What is needed is some way of selecting which accessories are loaded each time the system is booted. The program presented here does just that. Written in Megamax C, it compiles to a .PRG file, can handle up to 48 filenames and runs from an AUTO folder.

Before Gem is initialised the root directory is searched for files with the .ACC extender. Those found are listed, together with their on/off status. On a colour monitor the display will be in low resolution – blue accessories are active and red ones inactive. On a monochrome monitor each name is suffixed by either ON or OFF. Figure I shows this in action.

Toggling the status of an accessory is simply a matter of selecting it with the cursor keys and pressing Return. The currently selected name is displayed in inverse video. It should be noted that these names are the disc filenames and not necessarily the name of the accessory itself.

When selection is complete, press the spacebar to make the changes permanent or Escape to abort the operation. If the selection is confirmed, the selector will rename unwanted accessories and give them a .ACX file extension. Note that the disc must be write enabled.

Also it will only allow six accessories to be made active on a disc – the maximum permissable. Any attempt to exceed this number will result in the operation being aborted automatically. If all is well, the ST will finish the boot sequence, load the selected accessories and initialise Gem.

Although the program ensures that you don't try to load more than six desk accessories, it has no way of detecting those that use more than one slot. This is rare, so it is left to you to be aware of this.

For testing and debugging purposes it is obviously more convenient to run the program from the desktop, rather than from an AUTO folder after re-booting.

It will run correctly, but won't have any effect on the accessories until the computer is re-booted. However, if the mouse is moved, it tears a hole in the screen – this doesn't happen when the program runs from an AUTO folder because Gem isn't initialised at that stage.

The start-up messages are not essential although they are useful for debugging. Hard disc users will probably find they flash by too fast to be readable. Once the program has been fully tested they can be deleted from the source code and the selector recompiled.

To install the program on a standard machine, simply copy it into an AUTO folder on any disc that contains accessories. Users of hard drives should copy it into the AUTO folder on the default or boot drive, C: in most cases.

COMPATIBILITY

Selector is written in Megamax C. At the beginning of the file is a list of #include statements – other compilers may have different requirements. Gem-oriented header files such as obdefs.h are not required. This minimises the size of the final code.

The#defines are there to make the program mor readable. Many of them, such as OR and AND, are there purely to aid clarity of coding and program entry. The others provide easy-to-read access to the VT52, screen emulation escape codes.

Generally speaking C is a very portable language and you should have few problems in converting this program to work with other compilers. The only major difference likely to cause difficulty is that integers defined by the int command are 32 bits wide in Lattice C and 16 bits wide in Megamax.

```
                Atari ST User Accessory Selector
            The following desk accessories are available:
            those marked ON will be loaded when you exit.

ASCII    OFF     CHARSET  OFF     COUNT    OFF     PHONE    ON
SNAPSHOT OFF     AUTOGEM  OFF     CONTROL  ON      DIRPRI   ON
EMULATOR OFF     FREERAM  OFF     FUNKEY   ON      INTRAMDK OFF
MINIDOS  OFF     PROCALC  OFF     SAVED!   ON      SCRPROT  OFF
WATCH    OFF     STDOCTOR ON

                Cursor keys - select an accessory
                Return/Enter - change on/off status
                Space: Update and exit, Escape: Exit
```

Figure I: Selector in action. High or medium resolution display

SUBROUTINES

main	The main entry point for the program. detects screen resolution and calls all other functions.
acc_scan	Searches the disc for files with the .ACC or .ACX extenders.
acc_display	Displays the accessories in a simple menu format.
handle_input	Gets input from the keyboard.
acc_rename	Renames any accessories whose names have been changed.

```
/*    Accessory Selector    */
/*    By Martyn Dryden      */
/*    (c) Atari St User     */
#include <stdio.h>
#include <osbind.h>
#include <string.h>
#define is ==
#define not !
#define is_not !=
#define AND &&
#define OR ||
#define TRUE 1
#define FALSE 0
#define NULL \0
#define ERROR -1
#define NEWLINE \n
#define HIRES (resolution is 2)
#define MEDRES (resolution is 1)
#define LORES (resolution is 0)
/* Atari VT52 #defines  */
#define CLEAR "\033E"
#define HOME "\033H"
#define CURSOR_HOME printf("%s",HOME)
#define CLS printf("%s",CLEAR);CURSOR_HOME
#define RVS "\033p"
#define R_VID printf("%s",RVS)
#define NOR "\033q"
#define N_VID printf("%s",NOR)
#define BEL "\007"
#define DING printf("%s",BEL)
#define EOL "\033K"
#define CEOL printf("%s",EOL)
#define COL4 "\033b\004"
#define COL1 "\033b\001"
#define BLUE printf("%s",COL4)
#define RED printf("%s",COL1)

at(row,col)
int row,col;
{
 int r,c;
 r=32+row;
 c=32+col;
 printf("\033Y%c%c",r,c);
}

say(string)
char*string;
{
 while (*string != NEWLINE && *string != NULL)
  putchar(*string++);
 putchar(NEWLINE);
}
```

```
int resolution,finished=FALSE,escape=FALSE;
int acc_s_old[48],acc_s_new[48],acc_c=0,ix=0;
char acc_name[48][14],disp_name[48][14];

main()
{
 resolution=Getrez();
 printf(" Accessory Selector\n");
 if(acc_scan())
 {
  acc_display();
  do
  {
   handle_input();
  } while(not finished);
  if (not escape)
   acc_rename();
 }
 else{
  printf(" No desk accessories found on this disk.\n");
 }
 bail_out:
 printf(" Returning to desk.\n");
}

acc_scan()
{
 int drive,found=ERROR;
 long filename;
 char filespec[14];

 drive=Dgetdrv();
 filespec[ 0 ]=drive+'A';
 strcat(filespec,":\\*.AC?");
 printf(" Seeking desk accessory files on drive %c...\n"
,filespec[0]);
 found=Fsfirst(filespec,0);
 if(found<0) return(FALSE);
 filename=Fgetdta()+30L;
 strcpy(acc_name[acc_c],filename);
 acc_c++;
 do{
  found=Fsnext();
  if(found>ERROR){
   strcpy(acc_name[acc_c],filename);
   acc_c++;
  }
 } while (found>ERROR AND acc_c<48);
 return(TRUE);
}

acc_display()
{
 int i;

 for(ix=0;ix<acc_c;ix++){
   strcpy(disp_name[ix],acc_name[ix]);
  for(i=0;i<=strlen(disp_name[ix]);i++)
    if(disp_name[ix][i] is '.') break;
  disp_name[ix][i]=NULL;
  acc_s_old[ix]=(acc_name[ix][i+3] is 'C');
  acc_s_new[ix]=acc_s_old[ix];
 }
 CLS;
 help_info();
 for(ix=0;ix<acc_c;ix++) show_acc(ix);
 ix--;
}

help_info()
{
 if(HIRES OR MEDRES){
  at(0,22);
```

```
  say("Atari ST User Accessory Selector");
  at(1,17);
  say("The following desk accessories are available:");
  at(2,17);
  say("those marked ON will be loaded when you exit.");
 }
 else{
  at(0,3);say("Atari ST User Accessory Selector");
  at(1,5);say("Available accessories:");
  at(2,5);BLUE;say("Accessory ON");
  at(2,20);RED;say("Accessory OFF");
 }
 if(HIRES OR MEDRES) at(21,21);else at(21,1);
 say("Cursor keys - select an accessory");
 if(HIRES OR MEDRES) at(22,21);else at(22,1);
 say("Return/Enter - change on/off status");
 if(HIRES OR MEDRES) at(23,21);else at(23,1);
 say("Space: Update and exit, Escape: Exit");
}

show_acc(which)
int which;
{
 int row,col;

 row=4+(which/4);
 if(HIRES OR MEDRES) col=4+((which%4)*19);
 else col=1+((which%4)*10);

 at(row,col);
 if(LORES AND acc_s_new[which]) BLUE;
 if(LORES AND not acc_s_new[which]) RED;
 say(disp_name[which]);
 if(HIRES OR MEDRES){
  at(row,col+9);
  if(acc_s_new[which]) say("ON ");
  else say("OFF");
 }
}

handle_input()
{
 int hi,lo;
 long key_in;

 R_VID;
 show_acc(ix);
 N_VID;
 key_in=Bconin(2);
 at(19,0);CE0L;
 hi=(int)(key_in>>16);
 lo=(int)(key_in%256);
 if(((hi is 0x39 AND lo is 0x20)
  OR (hi is 0x01 AND lo is 0x1B))
  AND (not too_many()))
  {
finished=TRUE;
    if (hi is 0x01 AND lo is 0x1B)
    escape=TRUE;
    else escape=FALSE;
  }
 else if(lo is 0x0D) acc_s_new[ix]=not(acc_s_new[ix]);
 else if(lo is 0x00){
  show_acc(ix);
  switch(hi){
   case 0x4B:{
    ix -= 4;
    if(ix<0){
     while(ix <= acc_c - 1) ix += 4;
     if(ix>acc_c - 1) ix -= 4;
    }
    break;
   }
   case 0x4D:{
    ix++;
    if(ix >= acc_c){
     ix--;
     while(ix%4>0) ix-- ;
    }
    else if(ix%4 is 0) ix -= 4;
    break;
   }
   case 0x50:{
    ix += 4;
    if(ix >= acc_c){
     while(ix >= 0) ix -= 4;
     if(ix<0) ix += 4;
    }
    break;
   }
   default: DING;
  }
 }
 else DING;
}

too_many()
{
 int i,count=0;

 for(i=0;i<acc_c;i++)
  if(acc_s_new[i]) count++;
 if(count>6){
  DING;
  if(HIRES OR MEDRES) at(19,23);
  else{ at(19,3);BLUE;}
  say("** Sorry, not more than SIX **");
  return(TRUE);
 }
 else return(FALSE);
}

acc_rename()
{
 int success=0;

 CLS;
 for(ix=0;ix<acc_c;ix++){
  if(acc_s_new[ix] is_not acc_s_old[ix]){
   if(acc_s_new[ix]) strcat(disp_name[ix],".ACC");
   if(acc_s_old[ix]) strcat(disp_name[ix],".ACX");
   printf(" Re-naming %s as %s...\n",acc_name[ix]
   ,disp_name[ix]);
   success=Frename(0,acc_name[ix],disp_name[ix]);
   if(success <= ERROR) printf(" Failed.\n");
```

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BAD CAT

The graphics used are of a high standard, the events original and the sound is superb." **ST USER**

Screen shots from Amiga version.

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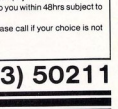

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ACCESS VISA

Five star economy

Barry Wood shows how to keep down your motoring bills

THIS program is designed to help you keep track of your petrol consumption. It enables you to work out your current consumption in miles per gallon and compare it with previous values. The current and the last nine values calculated are displayed on an easy-to-read bar chart.

By keeping track of the amount of petrol used you can see whether the engine requires tuning – consumption will increase as your car approaches its next service.

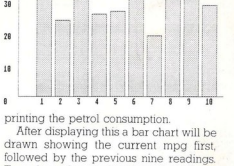
If you regularly tow a caravan, this will also show up on the chart and you can see the effect of the extra weight on the engine's efficiency.

The program is written in GFA Basic and the line numbers aren't required – they are there just to make the listing easier to read. After entering it, the program can be compiled to a PRG file if you also have the GFA Basic compiler and can then be run from Desktop.

It will run in either high resolution monochrome or medium resolution colour and you'll first be asked if you wish to load the previous results. If you haven't run the program before the answer will of course be no.

Next you'll be asked if you wish to calculate your current petrol consumption. Click on Yes in the Alert box here. Enter the number of miles covered at the first prompt and the number of gallons used at the second.

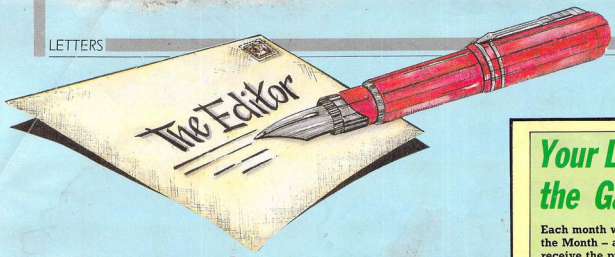
Many petrol pumps now deliver their petrol in litres instead of gallons. You can enter the amount of petrol in litres by tagging an L on to the end of the number input. The program will convert this to gallons for you before calculating and



printing the petrol consumption.

After displaying this a bar chart will be drawn showing the current mpg first, followed by the previous nine readings. Tap a key when you've seen enough and you'll be prompted to save the data to disc. Next time you'll be able to load this and compare your new consumption with the previous ones. □

```
    10 Rem Petrol Consumption
    20 Rem By Barry Wood
    30 Rem (c) Atari ST User
    40 '
    50 Rem Written in GFA Basic
    60 Rem Don't enter line numbers!
    70 '
    80 Dim Mpg(10)
    90 Cls
   100 '
   110 Alert 2,"Load data file?",0,"Yes
|No",Button
   120 If Button=1
   130 Fileselect "\*.*","DATA.MPG",Nam
e$
   140 If Exist(Name$)
   150 Open "I",#1,Name$
   160 For I=1 To 10
   170 Input #1,A$
   180 Mpg(I)=Cvf(A$)
   190 Next I
   200 Close #1
   210 Endif
   220 Endif
   230 '
   240 Alert 2,"Calculate new MPG?",0,"
Yes|No",Button
   250 If Button=1
   260 For I=9 Downto 1
   270 Mpg(I+1)=Mpg(I)
   280 Next I
   290 Print At(1,5);
   300 Input "How many miles covered";M
iles
   310 Input "How much petrol used";Pet
rol$
   320 A$=Right$(Petrol$,1)
   330 Petrol=Val(Petrol$)
   340 If A$="L" Or A$="l"
   350 Petrol=Val(Petrol$)/4.5
   360 Endif
   370 Mpg(1)=Int(Miles/Petrol)
   380 Print "Petrol consumption = ";Mp
g(1);" miles per gallon.....hit a key"
   390 Repeat
   400 Until Inkey$<>""
   410 Cls
   420 Endif
   430 '
   440 Res=Xbios(4)
   450 Ox=32
   460 Oy=199*Res-16*Res
   470 For I=0 To 5
   480 Print At(1,4+I*4);50-I*10
   490 Next I
   500 Print At(1,3);"MPG"
   510 For I=1 To 10
   520 Print At(6+I*5,24);I
   530 X=Ox+I*40
   540 Y=Oy-Res*Mpg(I)*3
   550 If Mpg(I)
   560 Deffill 3-Res,2,1
   570 Pbox X,Oy,X+32,Y
   580 Endif
   590 Next I
   600 Draw Ox,Oy-160*Res To Ox,Oy To O
x+500,Oy
   610 Deftext 1,8,0,16
   620 Text 100,16*Res,"Petrol Consumpt
ion"
   630 Repeat
   640 Until Inkey$<>""
   650 '
   660 Alert 2,"Save data file?",0,"Yes
|No",Button
   670 If Button=1
   680 Fileselect "\*.*","DATA.MPG",Nam
e$
   690 Open "O",#1,Name$
   700 For I=1 To 10
   710 Print #1,Mkf$(Mpg(I))
   720 Next I
   730 Close #1
   740 Endif
   750 End
```



Genealogical databases

MY family enjoys reading Atari ST User *very much, even though we are still newcomers to the world of the ST.*

However, can we be the only people hooked on their family history, or have we missed one of the very early issues which deals with this? We have some friends who own an Amstrad PCW, on which they can use a genealogical program issued by the Mormons. Naturally, I am green with envy.

Currently we have Timeworks' Data Manager with Report Writer and Super Graphics. Is it at all possible to use this to load up my family information and get it out again? – **Mrs Stephanie Nicholson, Sunbury on Thames, Middlesex.**

● There's no reason why you shouldn't use a database to record your family tree. However, getting the information out again in the format you require can be more than a little tricky.

K-Data and Base Two are both powerful databases that you may be able to tailor to your needs, and were reviewed in the December 1987 issue of *Atari ST User*.

The software you've seen for the PCW was written specifically with genealogists in mind, and as far as we know it's not yet available for the ST. Perhaps one of our readers can help you further?

Accessory to an error

AFTER reading mailbag in the December 1987 issue of Atari ST User, *I feel I should point out some minor inaccuracies in your reply to the letter from Peter J. Potts regarding booting from the hard disc.*

Firstly, special software is not required to load accessories from the hard disc. All that is necessary is to ensure that the accessories to be loaded are present on drive C. At boot-up, Tos checks for the presence of a hard disc and automatically will look on drive C (if installed) and load any accessories it finds there.

This is documented in Atari's SH204 owners manual on Page 18. Your reply refers to autoboot accessories, which is confusing. Autobooting is one process and the loading of accessories another.

Secondly, there are public domain programs which will set up a hard disc for autobooting. This will enable the ST to boot without a disc in drive A.

Finally, the second part of your answer may be confusing. It is true that a PRG file will run automatically from the AUTO folder, but it must be on the correct drive. Without the hard disc autoboot, the AUTO folder must be in drive A. With hard disc autoboot it can be on drive C.

Elusive colour printouts

I RECENTLY bought an Atari 520STFM and am using Rainbird's Advanced OCP Art Studio to produce pictures. Initially I had no problem producing monochrome dumps by pressing the Alternate and Help keys together.

Armed with this knowledge, I borrowed an Integrex Colourjet 132, but so far all my attempts to obtain a colour printout have failed. Unfortunately, the printer's manual was not very helpful. Can you help please? – **John Wilton, Chichester, West Sussex.**

● The screen dump used by the Advanced OCP Art Studio is supplied as standard as part of Tos. While the early versions of Tos do not provide facilities for colour screen dumps, they are available in several art packages, most notably Degas Elite.

Since Art Studio saves its screens in NeoChrome format, they can be loaded easily into Degas and printed out in colour. Alternatively, if you have an assembler you'll find a colour screen dump listing in Atari ST Tricks and Tips, published by Abacus Software.

Programming in logic

I AM convinced that the Atari ST range is unbeatable, both in terms of power and price. As such I am seriously considering buying a 1040ST with the prerequisite that the language Prolog is available.

I know that versions of the language Lisp are available for the ST, but these would not suit my requirements, which are related to knowledge acquisition techniques in the Prolog environment.

If Prolog isn't available for the ST, I will be forced to buy one of those infernal PC clones. However, I believe that, a German firm by the name of Epsilon has produced a version, but I cannot trace its whereabouts. – **David Maynagh, Kirkconnel, Scotland.**

● Unfortunately we can't trace Epsilon Software. However, FProlog is available from Joint Venture Systems, 28 Victoria Road, Swindon, Wilts SN1 3AW. It costs £90.

For those readers who've never met Prolog, its name stands for Programming in Logic. Unlike mainstream languages such as Basic, Pascal and C, in Prolog the

Your Letter of th the Game of th

Each month we'll select a Letter of the Month – and the sender will receive the program which our reviewers have rated Game of the Month. This month reader Gavin Berry will receive Winter Olympiad,

Conquering the Terrorpods

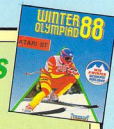
THE object of Terrorpods is to trade with the installations in order to gain enough aluma to build your very own terrorpod. The best installations to get aluma from are aluma mines, mineral centres and resource centres. The aluma should be taken to a manufacturing plant and traded for fuel rods.

If the plant has enough aluma the installation will be displayed as a manufacturing plant (component ready). Now trade more aluma with the plant and you

Plant location	Aluma required for part
4596	100
15116	200
25176	Unknown
34560	100
44616	300
48726	400
61736	500

Locations of the manufacturing plants in Terrorpods

Month wins Month!



which is reviewed on Page 48.

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.

will be offered part of a terrorpod. Repeat this process with all seven manufacturing plants listed here.

When all six parts of the terrorpod have been collected you will be given eight minutes to destroy 15 terrorpods. This is not easy, and the best way is to have a large supply of detonite available as opposed to missiles. This means you will be able to move around quickly and construct missiles en route.

During the early stages of the game move around by moving the drover and following it. In this way the precious fuel rods will not be wasted. The only time it is necessary to move with the drover on board is when you're destroying the terrorpods during the final phase.

The most important element of the game is detonite. Large amounts can be traded from detonite stores and resource centres. Be warned – pick your targets carefully, as each blast uses 50 units and each missile 1000.

During play do not use the function keys except in the final phase, as they use a lot of fuel.

This information should be enough to complete Terrorpods. In any case, you should have fun trying. – **Gavin Berry, Hucknall, Notttingham.**

program and its data are one and the same. A program therefore take the form of logical rules about facts. Prolog can apply the rules to the facts in response to a query.

It is therefore suitable for handling the problems directly, without having to construct a complex means of representing knowledge, as would be necessary in Basic, C and so on.

Colourful conversion

I WOULD be grateful for your advice on a small problem I have regarding the screen resolution of my colour television. At present I am using my 520ST on an ordinary 14in colour television and as you can well imagine the reception is far from satisfactory, and the prices of quality monitors are phenomenal.

I own a Microvitec Cub 653 colour monitor with a TTL input which I use on a Sinclair QL. I would like to know if it is possible to convert this monitor for use on my Atari and if not could you suggest an alternative? – **S. Raja, Canterbury, Kent.**

● You can use the Microvitec with the ST, but the monitor's input requires modifying to analog RGB. You'll also need a lead making up. The internal modification should be performed by a qualified engineer.

Basic, made for sharing?

AFTER many a long hour spent pondering, I have finally decided to upgrade from my trusty old 800XL to an ST. With all of these rumours about how bad ST Basic is, I find myself in the unwelcome position of hunting for an alternative.

Because of its high degree of support, my first choice would have to be Computer Concepts' Fast Basic. However, I would like to know if it is possible to run a Fast Basic program on someone elses machine once I'd written it.

If this is not possible, surely there isn't any point spending such a considerable amount of money if I can't share my programs with other people who aren't fortunate enough to own the Fast Basic cartridge? – **Owen Strong, Tonbridge, Kent.**

● Luckily, Computer Concepts already have a solution to your problem. It's called the Fast Basic run-only disc, and it's now supplied free with all cartridge versions of Fast Basic.

The disc contains two programs. The first, called Runner, is a run-only version of Fast Basic. Essentially, this is the whole interpreter with the editing functions removed. What's more, it's public domain, so you can pass it around freely without infringing copyright.

The second program, Tagger, is a utility to convert Fast Basic programs into either desk accessories or PRG files. It does not compile a program, but literally tags the entire interpreter on to a Basic program.

Detecting monochrome

I HAVE a non-Atari monochrome monitor with a composite video input. This gives a reasonable picture from the composite video pin from the monitor port on my 520STFM.

I was wondering if it is possible to access the high resolution monochrome mode. I assume this would be available by connecting the monochrome detect pin on the monitor output to something.

I would be grateful if you could tell me if this is possible and if so, how. – **J. Barnes, Barnsley, South Yorkshire.**

● Unfortunately this is not quite as simple as it might first appear. The ST can be switched into monochrome mode by connecting the monochrome detect pin to ground (0v).

The problem lies in the fact the ST's high resolution mode uses a 70Hz frame sync to generate its display. The standard in the UK is 50Hz (PAL) and in the US 60Hz (NTSC). Connecting the monitor directly to this output results in a garbled display and possible damage to the set.

The only solution is to connect Atari's own high resolution monitor, which is geared to use this frequency.

Pen pals please

I'M looking for all kinds of information, all kinds of software – you name it, I want it. Since I'm interested in learning how to program in machine code I would like to correspond with others who program in 68000. Keep up the good work, you are the best around – **Andy Mollinger, Gerard kreteelbergstaat 13, 6063 CJ Ulodrop, The Netherlands.**

Running the Gauntlet

I AM a 16-year-old owner of a Spectrum 128k wishing to buy an Atari ST. I have a few questions which you may be able to answer.

Apart from the price and lack of disc drive, are there any other differences between a 520STM and a 520STFM? I have a budget of £350 and only want an ST for games, so if I did buy the cheaper STM would I be able to run the latest games software such as Gauntlet? – **Kenneth Jackson, Edinburgh.**

● Apart from the lack of drive, there is no difference between a 520STM and 520STFM – unless you want to increase the amount of ram at some time, in which case it's easier with an STFM.

Don't forget though, if you want to play games, you have to be able to load them in, so you'll need a disc drive.

If you check through the advertisements in this issue, you will see a 520STM costs around £239, but there's no disc drive and no mouse at that price.

A 520STFM will cost around £279 and for that you get a single sided disc drive built in – plus a mouse. The economics speak for themselves.

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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, Hi-Soft 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.

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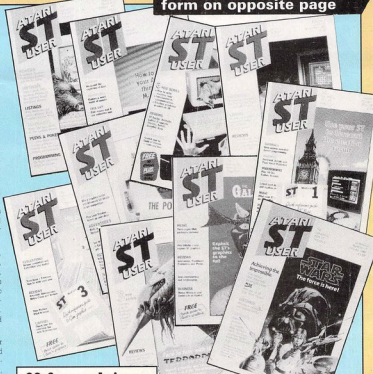
January issue 1988: Reviews: Star Wars, Defender of the Crown, Screaming Wings, Bubble Ghost, Mortville Manor, Xanarama, Chessmaster 2000, Cyrix, Barbarian, Epson EX-800, Mark Williams C, Graf Tablet, Pro Sprite Designer. Listings: User port software, Printer buffer, The Golden Crown. Features: Gallery, adventures, word processing.

February issue: Reviews: Midi Maze, Star Trek, Indiana Jones, Nord and Bert, K-Word 2, TextPro, TuneUp, Forten, PaintPro. Listings: Alternative function key definer, Sliding block puzzle. Features: Atari St User show report, Gallery, adventures with Brillig.



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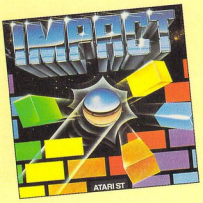

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Castle Computers	56	Red Rat	43
CBS	66	Robtek	80
Centec	96	R.S.D.Connections	79
Cestrian Software	41	Shareware Marketing	92
Chips	39	Sigma	3
Communication + Media	54	Silica Shop	99
Compumart	39,41,43	Silicon Systems	82
Compusense	78	Simtech	25
Computer Concepts	6	Siren Software	83
Computer Express	55	Soft Bits	70
Computer King	88	Soft Touch	67
Computer Oasis	88	Software Express	25
Comtec	72	Software Supersales	64
Concept	92	Southwest Software Library	30
Cut Price Software	97	ST-Club	70
Cygnus Trading Company	92	Startsoft	97
Delta	79	Start Systems	52
Doctorsoft	79	Stocksoft	92
Eidersoft	76	Storm	96
Electric Distribution	17,19	Sunaro Software	24
Evesham Micros	58	Timesoft	78
Futuresoft	96	Top Copy	96
Frontier Software	28	Trowbridge	62
Glintland	98	Turtlesoft	20
Gultronics	8	Tynesoft	2
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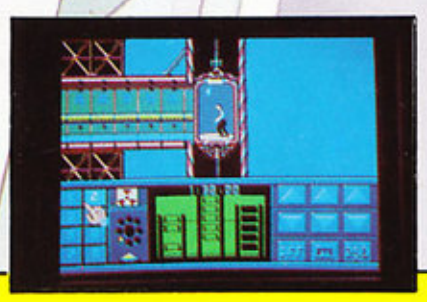
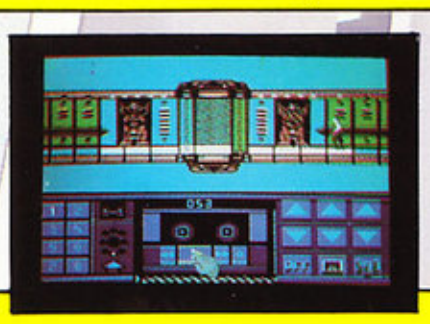


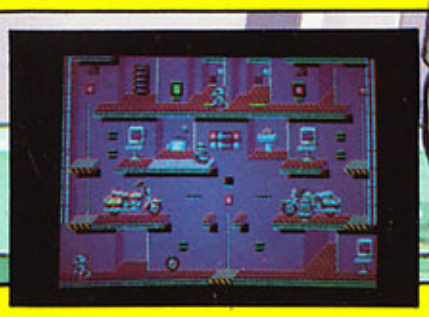
...From the lift you enter the first room...

...But where to next?...

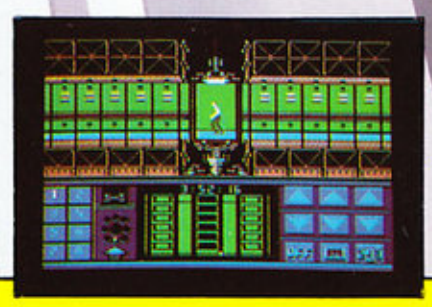
...Who or what is lurking behind these cars?...



...Can you access the next tower?...



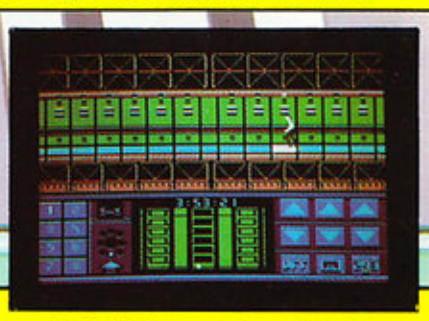
...Could the final P.I.N. number be here?...



...Running into more trouble?...

...Why is the robot guarding that table?...

...A message on the tape recorder?...



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