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News
All the news that's fit to print for owners of both 8 bit and ST machines.

Software
This month we take a look at Racing Destruction Set, Silent Service and four budget titles: One Man and His Droid, Kik Start, New York City and Action Biker.

Invasion
Tadesz Menert gives an insight into how Atari computers fare in Poland.

Graphics
Steven Williamson takes you through setting up player missile graphics in your own programs.

American Scene
Edward Shark brings us up to date with events across the Atlantic.

Game
This month you can test your flying skills with Space Maze, a multi-screen arcade game by Steven Davies.

Gadgets
Len Golding demonstrates how to construct a battery driven device controller via the Atari's joystick ports in the second part of this series.
Adventuring
Brillig's monthly excursion into the strange world of adventure games.

Art
Two versatile drawing packages, Technicolour Dream and Graphics Art Department, are put through their paces.

Utility
Correct that bug-prone Revision B Basic with Rambas, a neat machine code program from Robert Gear.

Mailbag
More of your letters about faulty cassette recorders, Revision B Basic, wordprocessing, bugs in games, and using joysticks from Basic... they're all covered by our keen readers.

£25 for you!
Five Liners
We borrow a trick from the BBC Micro in our latest five-line program — and we start a search for the best five-liners from readers, with £25 for each one printed.

Order Form
Two special offers for Atari User subscribers this month. You can save 50 per cent on insuring your Atari system (including all peripherals). And you can save up to £10 on blank discs.

3 ST roundup
Mike Cowley reports on how the ST is breaking into the educational market — and threatens the BBC Micro.

7 Advice
Andrew Bennett answers more of your questions on the ST range — about manuals, monitors and much more.

11 Bookshelf
Stephen Underwood reviews two new books — The Anatomy of the Atari ST and Gem on the ST.

15 3D Basic
Grant Owen shows how you can use ST Basic to generate three dimensional graphics.

21 C Compared
Pete Connors tests three implementations of the C language on the ST and compares the benchmarks.

27 Arcade
Jason Kingsley takes a look at the latest arcade game from Microdeal, the challenging Time Bandit.
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ST is outselling the Macintosh

A TOP secret report has revealed that Atari ST computers are currently outselling the popular Apple Macintosh machines in the UK.

Commissioned by Atari UK and only just completed, the document provides conclusive evidence that the ST is showing its rival a clean pair of heels. So much so that in certain parts of the country the ratio is as high as three to one in favour of the ST.

"It is true that we have now learned that the Atari is outselling the Macintosh," says Max Bambridge, Atari UK's boss, "and our sales are almost equally divided between the 520ST and the 1040ST."

While refusing to disclose actual figures — "you'll get those at the end of the ST's first full year in operation" — Atari's man in Britain is known to be well pleased with the results to date.

"This latest news only indicates that we are well on target," he told Atari User.

Meanwhile Atari's claim to have overtaken the Macintosh received support from a somewhat unusual quarter — the former Macintosh marketing manager.

Nigel Parry left Apple in August, 1984, and set up Laser Software primarily to cater for the Macintosh market. Since the arrival of the ST however, his company has been producing products for both machines.

"Now he reports that the ST is accounting for a lot more sales than the Apple computer. "It works out to be in the region of 2.5 to one," he says. "Atari's policy of providing a simple user interface at a fraction of the cost of competitive systems has meant a large and increasing installed base."

The product most in demand by ST users from Laser is its Laserbase ST which retails for £99.95 — and Nigel Parry reports that much of the interest is coming from schools. As a result, the software house has announced educational discounts for its programs.

Not that this boom in sales from the ST market means that Nigel Parry intends to turn his back on the Macintosh.

"I'm not knocking the Macintosh in any way," he says, "and anyone who drops in at my office will find I use both a Macintosh and an ST."

"But it seems as far as users are concerned Atari has delivered the right machine at the right price and is successfully exploiting the last niche left in the market."

Kim's 800XL wins the MicroLink competition

COMPUTER shop salesman Kim Burgess used his Atari 800XL to win a free weekend in London.

Kim, 33, correctly answered the 15 questions about MicroLink, the UK's fastest growing electronic mail service.

The competition was organised in conjunction with British Rail who offer seat and sleeper reservations using MicroLink's new telebooking service. Hundreds of entrants successfully answered the 15 questions but Kim's was the first name drawn from a hat.

Much to the delight of his wife, Jane, he won a weekend in London for two, free rail travel, luxury accommodation at a London hotel, free tickets to a Database Exhibitions computer show and finally a wonderful trip to Stratford upon Avon on a steam-hauled excursion train. Kim, of Bromley, Kent, said: "I used my Atari 800XL to log on to MicroLink and then searched through the text to find the answers."

"I find MicroLink very useful. In fact we have just booked two seats for a London theatre using the system."

"It was an incredible weekend. My wife and I thoroughly enjoyed the outing. Everything was perfect".
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PLEASE USE THE ORDER FORM ON PAGE 57
John knows how to keep his customers happy

SCOTSMAN John Mullen has turned his computer shop into a real At-Home-with-Atari club. People who pop in with queries or wanting details about Atari machines and software end up sipping coffee served by one of his nine-strong staff.

And those who are really hooked on computers are even invited to join him on coach outings to see what’s new in the computer world at exhibitions.

John, managing director of Warrington (Cheshire) All Computers, cannot stop thinking up novel ideas to keep his customers happy.

“When I had an Atari 800 XL a few years ago I just could not get any help with it. I realised there was a vast gap in the market, so I set up my own shop. Now I have two branches and the Atari models have lots of enthusiasts”, he said.

“To survive you have to be aware of the computer market, read magazines like the Atari User and visit trade and public shows to see how the public react.

“I found it expensive for a family to go down to London for an exhibition so I arranged to hire a coach to visit every show and have had no difficulty filling every seat with each customer just paying a share of the hire price – which works out about £12 from here”.

As well as a full repair service, John runs a customer request service. “Instead of them hunting about for new software – which generally is announced as being out but isn’t – I do it for them and ring them when it is available”, he said.

With the help of his manager, Robert Blinkhorn, he has now introduced an Atari Computer Club, held in the evenings in an adapted stockroom.

For £3 a year families are encouraged to learn new skills and discuss problems or ideas at the club sessions.

John and his wife, Kathryn, who does the accounts, believe keeping the customers happy and well served is a vital part of any business.

MERCENARY FOR THE ST

AN Atari ST version of the successful Mercenary – Escape from Targ game is due for release soon from Novagen.

Out now is The Second City, a second data set for the Mercenary game, which uses the load game facility to provide a new scenario.

Mercenary, The Second City and a Targ Survival Kit, which includes maps and books, costs £24.95.

New releases

NEW business graphics software for the Atari 8 bit range has been released by Arioosoft.
B/Graph is a presentation tool for sales, marketing, forecasting, accounting and management.

It can graph up to three factors with 100 data points each and convert instantly between graph types without re-entering data.

Statistical Analysis functions include standard deviation, variance, Chi-square regression analysis and function plotting.

The twin disc costs £29.95.

A DATABASE management system from Haba Systems, which is claimed to be intuitive, has been released for the Atari 520ST and 1040ST.
Haba is planning to introduce a new title for the ST every month. Next release will be Haba Spelling Checker designed to work with the company’s word processor, Habawriter.

Habaview costs £74.95.

A LEADING budget games company has brought out a new label for its software aimed at the Atari 8 bit range.

Mastertronics hopes this will increase its market share – currently 11 per cent – by as much as four per cent.

Announcing the new label – Entertainment USA – with two new games for the Atari 8 bit machines, Bump Set Spike – Double Volley Ball and Vegas Pocker, a spokesman said: “Certainly over the next year we expect our market share to be in excess of 15 per cent and the Atari machines could be a significant factor in that increase”.

The games each cost £1.99.

LATEST Adventure released by Level 9 for the Atari 8 bit range, is Price of Magick.

Object is to take over the red moon crystal ball and learn spells to control the enemy.

The game has two programs on a single cassette and costs £9.95.

July 1986 ATARI USER
Now's the time to link your Atari to the big wide world!

Join the communications revolution and use your Atari (plus the telephone) to roam the world...logging on to Prestel, Micronet, MicroLink, Telecom Gold and the dozens of specialised Atari bulletin boards in the USA. Help yourself to thousands of free telesoftware programs - and much, much more!

You'll be able to read all about it in Britain's No. 1 communications magazine TeleLink. And with the latest (May/June) issue there's a free supplement that gives a guide to all the modems and comms software now available for the Atari 8-bit and ST ranges.

Here's a very special offer for readers of Atari User. For every subscription ordered using the form below, we will give you your first quarter's subscription to Micronet - worth £10 - absolutely free of charge. If you would like to take advantage of this offer, don't forget to tick the box!

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**New ribbons for old**

A NEW-ribbon-for-old scheme for Atari printers has been set up by Aladdin. Used printer ribbon cassettes sent to the new Scottish company will be returned within a few days re-inked and ready again for use.

Aladdin is offering the service at one third of its normal retail price, with a minimum of £1. The company suggests having two ribbons—one for use while the other is away being re-inked.

The service is available to anyone by posting a used cassette, together with a remittance equal to one third of the price originally paid for it, with a minimum of £1, stating the make and model of the printer.

---

**Fortran, Pascal compilers**

Two new compilers for the Atari ST have been brought out by Prospera Software.

ProFortran-77 can be used to compile programs transferred from minis or mainframes and uses the existing library software.

It has 7 and 16 digit precision floating point, 4 byte integers and full GEM, AES and VDI bindings to take advantage of the GEM user interface.

ProPascal is a complete ANSI 770X3.97 standard Pascal compiler with extensions, including strings, 7 and 16 digit precision floating point, separate compilation and 4-byte integers.

Turbo source code will port to the Atari with minor modifications.

Each costs £129 and comes with a 230 page manual. Neither is copy protected.

---

**Atarists are beach pavilion attraction**

A SEASIDE cafe overlooking a magnificent view of Anglesey in North Wales is the unusual setting for Britain's newest and probably smallest computer club.

Retired amusement machine engineer, Harry Trew, 62 years young, set up the club, which uses two 80XLS, in the beach pavilion and cafe at Llantwit-fachan, near Conwy, a month ago.

"About five years ago I became interested in a computer, using it to do my cafe accounts. Now I have retired I thought it a good idea to encourage youngsters and grown ups to use the cafe as a base for sowing computer knowledge", said Harry.

"The nearest other club is at Colwyn Bay, about 15 miles away. We only have 18 members at present and about half turn up for the Saturday evening meeting".

Fortunately two members are local computer experts who bring along their 80XLS to help the youngsters. Some are studying for A levels and use the machines for their homework.

After hearing about the little Welsh club Atari User contacted Community Computers UK, a division of Inter-Action Trust, established to help young people make better use of computers.

Molly Llewellyn, managing director of Inter-Action's computer projects, said: "After you told me about the little club we were only too happy to respond. Shortly we will have two handbooks out which will answer all their problems."

---

**Added to the menu**

MENU+ has been added to the Metacomco range of programming languages for the Atari ST.

It will now be offered along with the latest upgraded versions of Lattice C, Pascal and Assembler.

As a GEM-based command shell, MENU+ is a high specification programming environment using pull down menus and the mouse to control programs, avoiding complicated command lines.

Either single programs or batches can be run and users can add their own tools, arguments and options to the menus. It provides a history function of previous commands, allowing re-execution of commands at a double click and works with any program written for the ST.

Price: £19.95.

Metacomco has brought in an upgrade service. Users of its ST programming languages can upgrade to the latest releases at a cost of £10 for each language.
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"Sid Meier and his team of simulation experts at MicroProse have outdone themselves with SILENT SERVICE, a re-creation of submarine operations in the Pacific during World War II. As a U.S. fleet submarine skipper, you can almost smell diesel oil and feel the deck rolling beneath your feet while searching the western Pacific for Japanese shipping." - Antic

Tighten down your safety harness...kick the tyres and light the fires! You are in for the thrill of a lifetime in ACROJET, your own personal jet! ACROJET simulates the BDS-1, a one-man, 200 miles an hour plus, jet aircraft that is fully acrobatic and everything a real pilot could want or handle!

ACROJET features 3-dimensional graphics, sophisticated instrumentation, including the outstanding quick response aerobatic manoeuvrability that can only come from a personal jet! ACROJET builds upon the fine tradition of MicroProse's best-selling Primary Flight Training Simulator SOLO FLIGHT, and uses the unique "in the slot" 3-dimensional flying perspective to allow those pilots who have soloed in SOLO FLIGHT to experience the thrill of jet aerobatic flying!

"This game is a good buy, well presented, thoroughly researched and enjoyable to play." - Computer & Video Games Jan 86

"This game is going to set a new standard with an outstanding combination of realism and playability." - "Once again, MicroProse have produced a great product with lasting appeal." - Your Computer Dec 1985

Selected U.S. Gold product is stocked by leading computer stores and selected branches of John Menzies and W.H. Smith.

MICROPROSE
THE WORLD'S FOREMOST SIMULATION SOFTWARE PRODUCER
Super simulation

Program: Silent Service
Price: £9.95 (cassette) £14.95 (disc)
Supplier: Microprose, Heneage Street, Birmingham B7 4LY. Tel: 021-359 3020

MICROPROSE, acknowledged experts in simulations, have another on release. Silent Service is a realistic American submarine simulation set in the South Pacific during World War II.

It offers three types of scenario - torpedo/gun practice, convoy actions and war patrols. Torpedo and gunnery practice gives you a swift and gentle way of familiarising yourself with the sub's controls. Control of all functions is handled by a mixture of joystick and keyboard inputs.

Although the list of more than 30 commands looks daunting at first sight, they have been well thought out and it is surprising how quickly you get to grips with them. The simulation revolves around multiple battle station screens, all of which are graphically impressive.

The primary battle station is the conning tower. This basically acts like a selection menu, allowing you to gain access to other screens.

The periscope's black cross-hairs turn white when you locate a vessel, the torpedo data computer is then automatically activated and target tracking displayed. Data available includes target identification, range, speed and for the benefit of really bright submariners, angle on bow and gyro angle.

Looking down on the surface the bridge gives you a wide-angled view of nearby islands, the coastline and ships.

It also indicates current visibility, the bearing of your view and, like most of the other screens, the sub's heading, speed, depth and throttle position.

The maps and charts screen is something extra special. It combines geographic, sonar and radar information on a map and shows the location of your submarine (black blob), torpedoes and any enemy ships (white blobs).

And how brilliantly Microprose have implemented this feature. On call up you are presented with a superb map of the entire Western Pacific.

Even more impressive is what happens when you hit the zoom key - the map is replaced with a patrol map which shows the 500 by 300 mile area surrounding your position.

Zoom again and you'll get a navigation map (60 by 40 miles).

Hit zoom once more and there's the most detailed attack map, showing an area of just 8 by 5 miles with any ships shown as small tails indicating the direction in which they're moving.

You can reverse the whole process by hitting the unzoom key. It's all quite stunning.

On top of all this there are a range of four skill levels and a variety of reality levels which allow you to customise any situation (limited visibility, zig-zagging convoys, some dud torpedoes, expert destroyers).

All this adds up to one heck of a depth and width to the game play. Silent Service has been brilliantly designed, immaculately implemented. Superb.

Bob Chappell

Wheelelie thrills

Program: Kik Start
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH. Tel: 01-337 6860

THE object of the game is to achieve the fastest time riding a motorcycle over three obstacle courses selected from a set of eight.

Obstacles include stationary vehicles, water, rough ground, walls and tyres, and each must be taken at an appropriate speed or you will crash, dropping to the bottom of the track and remaining at minimum speed to the end of the current obstacle.

Speed can be assessed from the changing sound of your motor, and is controlled by right/left movement of the joysticks.

Wheelelies are generated by pushing forward and you can jump by pressing the fire button. Pressing the Spacebar pauses the game. There is also a high score table.

My young users panel, aged 7 and 9, took to it immediately and delighted in driving the motorcycles wildly, enjoying the animation of the bikes, the riders swinging off in crashes, the wheels and the jumps.

They were enthralled and did not notice the slightly jerky horizontal scrolling.

Once the initial excitement died down the competitive element became apparent, and this is the game's real strength.

Two players can race on identical tracks, one in the top half of the screen and the other below.

Overall the game is fun, compelling and challenging and with eight different tracks it will take time to attain real mastery.

Kik Start will provide entertainment for all computer fans except expert arcade addicts who might find it too easy.

What a pity it is not available on disc.

Ian Finlayson

Sound .................. 8
Graphics .................. 9
Playability .................. 9
Value .................. 9
Overall .................. 9

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Ian Finlayson
Bit of a drag race

Program: Action Biker
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH. Tel: 01-337 6880

Looking at the graphics on the cassette inlay I was quite impressed by this game. However after loading, the game's graphics were a bit let down.

It appears that this is yet another example of a software house showing screen shots from other versions on the cassette case.

Action Biker is based on the lovable character in the KP Skips advert, Clumsy Colin.

The screen is divided into two sections, the bottom part containing information regarding the last object picked up, score, fuel and so on and the top of the screen scrolls around Clumsy Colin and his vehicle.

Although the graphics could not be said to be bad, they are not that good either. This seems to be the general level of the game - mediocrity.

The sound is one thing that is not mediocre. It is terrible. It includes a painfully grating tune which can thankfully be turned off.

You navigate Colin and his bike around the city which contains a fairground, a building site and a lake among other things, in search of items which will improve the performance of Colin's mean machine such as a gear box, leather gloves and a crash helmet.

After you have collected one item, another appears somewhere else. The position of these items becomes progressively more difficult to reach until you have to traverse the roller coaster or some scaffolding to reach them.

Once you have collected all the objects you take part in a drag race. I have not progressed any further than this, not because of the game's difficulty, but because it has not impelled me to do so.

On the positive side the game is very cheap and younger players would probably enjoy it because of its comparatively low difficulty level.

However hardened gamers will probably find that there is no real challenge and will quickly become disinterested.

I cannot really recommend this game and my advice would be to give Clumsy Colin as wide a berth as possible.

Mark Woolward

Crash on regardless

Program: Racing Destruction Set
Price: £14.95 (disc only)
Supplier: Aralosoft, 65 Long Acre, Covent Garden, London WC2E 5JH. Tel: 01-836 3411

RACING Destruction Set, to put it at its simplest, is Scalextric on the computer.

You drive a red vehicle along a slotted track in competition with a yellow vehicle controlled by the computer or another player.

You can change nearly all the parameters in the game. The gravity can range from one sixth of Earth's so when you go over a ramp, you really fly, or 23 times that of the Earth. There are no less than 14 settings to experiment with.

The number of laps can be anything from one to nine and there are four types of background scenery - race track, motocross, lunar and abstract.

And there's more. You can choose your own and opponent's vehicle from any of 10 different types - grand prix racer, baja buggy, dirt bike, lunar rover, stock car and jeep to name a few.

You can customise any basic vehicle since each has its own set of engine sizes and tyre types. For destruction play you can also add up to five layers of armour, seven layers of crusher power (useful when ramming the opponent), nine gallons of oil (for dropping slicks) and, would you believe, four landmines (destruction's the right word!).

There is a choice of an incredible 50 differently laid-out tracks to race on. The names are evocative - killer, snake, jump and tiger, for example, are as tough as they sound. Many are modelled on famous racing tracks and roadrace courses.

You can also design your own tracks or modify existing ones using a large selection of pieces.

The facility is simple to use and any tracks designed can be saved to disc.

Given all these features, the game is really something special. The graphics may be a trifle lacklustre but that's a small point when set beside the wealth of options.

There are thrills and spills galore and for sheer versatility the program is unbeatable. Pass me the chequered flag - Racing Destruction Set is a winner.

Bob Chappell
**Hit for a Song**

Program: One Man and His Droid
Price: £1.99
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH. Tel: 01-337 5880

The aim here is to navigate a droid through underground caverns to round up a flock of sheep. Loading the program, I was greeted with a bright, lively tune better than most found in full-priced games.

To begin the game proper you must first guide your way through a herd of cute little creatures called Ramboids which seem to be a mixture of cast-offs from PacMan and smiling yellow blobs with red cheeks.

At first this section adds to the game, but after a while it becomes a time-consuming annoyance.

The point of the game is to coax all the Ramboids into the teleport receptors in the 20 minutes allowed.

This may sound easy, but you also have to transport the Ramboids in a certain order so not only do you have to coerce one particular Ramboid to the teleporter but you also have to prevent any of the others from reaching it first.

The screen is split into sectors containing data on the Ramboids, the droid’s status mode and a monitor of what is happening around your well-animated and detailed droid.

The droid has three operational modes which can be toggled via the fire button.

Each Ramboid has a set pattern of movement (for which Mastertronic heartlessly call them stupid) and once memorised it makes your task of guiding them much easier.

Once you have rounded up all the Ramboids, with at least four in the correct order, you progress to the next level. Your task in level 2 is made harder by a plague of mobile brick walls getting in the way. Level three has a more complicated layout to master.

Mastertronic has included several very nice touches – a password for each level, a facility to obtain the position of each Ramboid in the caverns, a well presented high score table and optional keyboard control.

The game’s difficulty level is just right to optimise playability and it has very, nice colour graphics, a delightful continuous tune and very professional sound effects.

After an indifferent start I have become involved and am now an addict, not being able to leave the game alone.

At £1.99 this is a great value game which will become a massive hit.

Mark Woolward

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**Out of the Ark**

Program: New York City
Price: £2.99
Supplier: Americana Software, Parkway Industrial Estate, Heneage Street, Birmingham B7 4LY. Tel: 021-369 3020

The idea in New York City is that as a tourist you must visit 12 locations within a certain time. Included on your itinerary are the Empire State Building, Central Park Zoo, the UN Building, World Trade Centre and Grant’s Tomb.

More prosaically, you must also pay a call to such places as the subway, city hall, bank and post office.

New York is shown on screen in the form of a large, scrolling plan of the city. The graphics are very blocky and what you get are large chunks representing different buildings, interlaced with roads.

You begin by travelling around the city in a car. If you run out of gas or collide with another vehicle in the fairly busy traffic your car is towed away to the garage lot where storage charges begin mounting up.

Getting the car back means paying bills for storage, gas and repairs.

On foot you are safe from the traffic while on the pavements and can soon reach some of your destinations.

Provided they are open you can enter, whereupon the display will change to reveal the buildings interior.

This is where the game is at its most disappointing. The interiors are graphically boring and all you get to do once inside is play a very simple and crude arcade game.

The most common one is to make your way to the top of a grid of platforms and ladders, grab the prize and exit (ho hum).

In the zoo the game consists of erecting fences around escaped animals (yawn). At the bank, you dodge guards and bullets (zzzzz) while at the post office you must grab a letter and try to mail it (snore).

And really that’s about all there is to it. You just keep wandering around streets and playing silly, uninspiring arcade games for which you either earn or lose money, and keep doing this until your time is up.

Three or four years ago one could have said that this game had some merit. Now, though, it looks as if it came out of the Ark. Zippy graphics and a wider variety of challenges might have helped redeem it.

In a word, boring. My advice is to either save your money or look at some of the other offerings Americana Software have at this price.

Bob Chappell

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PAGE 6 - COMPLIMENTING AND EXPANDING THE WORLD OF ATARI

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PAGE 6.
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THE computer revolution that swept through the West at the end of the '70s and the beginning of the '80s arrived in Poland, with a delay of about three or four years, in the shape of the Sinclair Spectrum.

At that time it was the unquestionable ruler of the Polish computer market — and it still occupies quite a respectable position. For over three years any other computers that were brought to Poland by people coming back from their visits to the West were scarce, and their unfortunate owners tried to get rid of them as soon as it was possible, mainly due to the lack of software.

Even such well known brands as Commodore, Amstrad, Apple, not to mention our Atari, couldn't break through the curtain. One must be aware of the fact that a computer can only be useful if there are a certain amount of programs that can be used for both professional and entertainment purposes.

What good is a computer for which one could only get an odd few games and nothing else? Can it really serve one's purposes, or will it fairly soon degenerate into one more forgotten toy?

Poland does not supply its computer owners with any kind of software from the West. You can't just go into a shop and choose out of dozens of available programs. Even now the only way to obtain some really good and useful ones is to buy them from the computer clubs here, or to exchange the ones that you have for someone else's.

At the beginning of the '80s the situation was very much worse. Due to the fact that the Spectrum was the most widely used computer here, people planning to buy a micro in the West decided on the Spectrum. They knew that they would have no software problems whatsoever. And they were right.

It took them about three years to realise the serious limitations and inconveniences imposed by the Spectrum, and this was the beginning of the new period of computerisation in Poland.

The change was swift. First Commodore, then Apple, the BBC Micro and other brands began to appear in Poland. There was never an official import of personal computers into Poland. People bought them, however, from various countries and within months the Spectrum lost its monopolistic position. There were even a few earlier Atari products such as the 400 and 600XL.

Yet there was no one then who could predict which of all these brands would become a true leader in the field in Poland. Most people wanted something new that would shift the balance radically.

Then came rumours about the new release by Atari of the 800XL. Compared with the Commodore 64 it had better graphics and was to be more reliable. It had more memory than Sinclair's Spectrum and other products. One needn't buy an interface for printers, joysticks and so on.

Compared with the earlier Atari products it was more powerful and versatile, and it had fewer bugs in its version of Basic. Despite that, it was compatible with former Atari products, which meant that anybody deciding on buying it didn't have to wait months for interesting software.

But there was still a danger of buying something that wouldn't become popular here in Poland. Some took the risk, and I was one of them.

I was on holiday in England in 1985, and despite tight finances was positive about buying a computer. The chance occurred in August when I visited a second hand shop at Notting Hill Gate and spotted a nice 800XL with a data recorder and three software items for only £73, which was almost half price then.

Without hesitation I took it back home to Cracow. It took me about a month to locate other Atari users. There were about 50 at the time and for the games I had bought, I received in exchange five others and became the proud owner of eight games altogether.

I played them, enjoyed them, and learned more and more about my Atari. Everything went its own standard way. And then came a real shock.

For the first time in history, Poland bought a batch of Western personal computers — about 500 Ataris plus a certain amount of data recorders, disc drives and long awaited software.

Why Atari, and not Commodore or Amstrad? Well Jack Tramiel is, after all, of Polish origin, born in Warsaw (as far as I know). His Polish name was Jacek Tramiel.

One would think that the software and hardware problem in Poland was over now, and to some extent it was.

Things need, however, a little explanation. All this equipment was bought in by Pevez, a firm that sells such goods in Poland for Western currencies. And that makes a great
difference. The computer plus 1010 data recorder was sold for about $200, and one dollar (on the black market of course, as there is no way of buying it legally) costs over 600zl. This amounts to over 120000zl.

The most popular car in Poland, the Fiat 126p, costs here about 360000zl, if you still can’t figure out how much it was, let me give you one more number. My monthly pay, as a teacher of English at the Jagiellonian University, is 12500zl. No comments. A Polish phenomenon.

If, however, you think these Ataris were long in the shops you are wrong. Within days they were gone. Pevex immediately ordered further shipments of 600 XLs, disc drives, joysticks, data recorders and rom cartridges. This time they got more than 5000 computers.

Despite their high price, micros are desperately needed in Poland. They are so much in fashion here that youngsters sell what they can, beg from their parents, save money and buy them either in Pevex or for our own currency at the so-called markets which are held in all the major towns in Poland.

The Polish government ended all restrictions when it came to individual export or import of personal computers, so there is no customs duty to pay.

This led to extensive import of Ataris, which in turn lowered their price at these markets from over 150000zl to about 120-130000 for a computer with a data recorder. This second lot of Pevex-imported computers was also sold within days.

In the meantime there was such a huge demand for Atari software that even Pevex couldn’t cope. But the experiences of the former Spectrum users proved effective.

It took our Polish Atarians only a few weeks to organise a club. Although it does not act as an official Atari club, and does not provide membership cards, it serves an important role here being an informal association of all Polish Atari users.

Regular meetings are held four times a week in one of Cracow’s cafeterias. One gains one’s membership automatically when one buys an Atari computer, and there are no membership charges.

So Atari has become a leading computer brand in Poland. Of course there are regional differences, and in Lublin, for example, there are only about 50 Atari users, whereas there are over 2000 in Cracow, probably due to the location of the Atari club.

It is so strange that suddenly people who wouldn’t even look at each other a few months ago now meet and talk as if they had been friends for years. Before the computer boom, I couldn’t imagine myself talking about Basic, or about some mathematical formulas, with a complete stranger and what’s more, one whose professional interests are utterly different from mine.

The gap between the scientific and humanistic minds is disappearing, I wouldn’t like to suggest that we owe all this to Atari, although it’s quite true in my case.

Most of my work can be done now much quicker and much more efficiently with the computer. Take translations. Before I bought my Atari I had to type and retype the translated text at least three times. Now Ataríwriter does most of the work for me. The same applies to creating tests for my students and writing letters. I also never imagined that the adventure games I try to use during my English lessons would be so useful.

When a few years ago I read about the revolution in the field of computers and when I kept on seeing all these colourful advertisements of a great number of different brands of computers, I was afraid that we would be left far behind the mainstream of modern technology and would occupy some inferior position because the gap between our societies helps the growth of the gap between our technologies.

Now I see we somehow managed to get past this dangerous stage. We are still behind, that is beyond question, but we are moving, and this brings hope.

No one likes to be last. The urge to make up for lost time is so great that there is now not a single magazine, or even newspaper, that wouldn’t publish something about computers.

There are even computer-dedicated TV programmes like Halo, Komputer and Spektrum, radio broadcasts of computer news, and programs transmitted on-air.

There are whole newspapers dealing only with hardware and software problems like Bajtek, Komputer or Mikroklan. There are no magazines yet dedicated to a single computer, but who knows what will happen within a year?

Taking everything into consideration, the prospects for the Atari in Poland seem to look great, better than for any other computer here. A lot depends on Atari themselves. Will they remain really reliable, and keep on supplying good programs? Much depends on Atari users, both here and abroad. The former must prove that their computers can do more than other machines. The latter, being far more experienced and having greater access to up-to-date information, could provide the Polish Atarians with their ideas and solutions to various problems.

I at least, am extremely grateful for all the letters and help I have received from Atari users from all over the world — mainly in England and the USA — with whom I got in touch.

When I needed them they were there, and that is what counts. We all do it for fun, for pleasure.

We deal with the so-called artificial intelligence. We operate the machine. How it is then that we still are human and friendly? Even more friendly and human than before we bought these unhuman machines.

Best wishes to all of you!

Mr Menert would welcome correspondence from other Atari users. His address is Tadeusz Menert, c/o Grzegorz Wrobel, ul. Starbiskiego 10/31, 30-071 Krakow, Poland.

July 1986 ATARI USER 21
**Hey Presto! Now things are taking shape on screen**

Part Three of STEPHEN WILLIAMSON's series on player missile graphics

We have already seen how to design a player and convert that design into bit-mapped code that the player missile system can recognise. The program this month illustrates how to initialise the system so that the player shape can be displayed on screen.

Before looking at how the program is constructed it is helpful to be clear about how the Atari keeps track of its memory. It stores information or data in memory locations, also known as addresses. In a 64k computer these are numbered from 0 to 65535.

If in direct mode you type, say, POKE 755.4 then you are storing the number 4 in memory location 755. The number that is stored must be within the range 0 to 255, and is measured as 1 byte of memory. A memory location cannot hold more than 1 byte.

Last month we saw the method of bit-mapping, in which a single number within the range of 0 to 255 can represent a pattern of eight pixels, or a binary number which consists of a combination of eight 1s and 0s. Using this method is one way of working in a binary number system without actually having to program in the binary 1s and 0s which can be very tedious indeed.

Each 1 or 0 occupies 1 bit of memory – so in the player stripe each pixel in the eight pixel row occupies one bit of memory and one row of pixels uses one byte. 256 bytes are known as one page and four pages equal one k (1024 bytes).

If like most of the population, you are used to decimalisation this may all sound like the old illogical money system where 12 pence made one shilling, and 20 shillings made one pound. Don't worry, it is not vital to fathom the reasoning behind the Atari's memory number system, but it is important to remember that eight bits equal one byte, 256 bytes equal one page and four pages equal one k (1024 bytes).

Part of the Atari's memory is allocated to ROM (Read Only Memory) which contains the Basic interpreter and the operating system. Other areas of memory are known as RAM (Random Access Memory) and it is the RAM addresses where Basic programs are stored.

The first thing that is required when initialising the player missile system is the reservation of an area of RAM that is not needed by our Basic program, and where the bit-mapped data that represents the player and missile shapes can be stored.

In the case of single resolution players this must be a 2k section, and 1k for double resolution. The player missile system must then be informed where this area is so that it can be displayed on the TV screen by means of the GTIA chip. This method of taking information directly from RAM is known as Direct Memory Access, or DMA for short.

The start of this storage area is called the player missile base, or PMBASE for short. In theory we could reserve a 2k or 1k memory area in one of several places within RAM, but in practice it is usually allocated somewhere near the top to avoid clashing with Basic programs that are stored lower in RAM.

To find out where the top of RAM is on your Atari, type PRINT PEEK (106) and press Return. If you own an
800XL you will see the number 160 on the screen. This will be different on models with less RAM, such as the 600XL.

The number 160 is the end of RAM expressed in pages. Immediately above this address is the start of the ROM area where the Atari Basic interpreter resides. The page number found in location 106 is known as RAMTOP, for obvious reasons.

If RAMTOP is 160 its address is 40960 bytes above the bottom of memory – 256 x 160 pages. This is 40959. Remember that the Atari counts from 0, and not from 1 as humans tend to do.

The player missile data area must obviously be placed somewhere below RAMTOP. There are two factors that decide just how near RAMTOP we can go. The first is that single resolution data must start on a 2k boundary. This means that PMBASE must begin at 8 pages or 16, 24, 32 and so on below RAMTOP – eight pages being 2k.

For double resolution players we need a 1k or 2k boundary – 4, 8, 12, 16 and so on pages below RAMTOP. Why the system demands a 1k or 2k boundary I am not sure but Antic has its own rules and we have to stick to them.

The other restriction is to make sure that the top of the player missile data area does not conflict with the screen memory area which is also stored at the top of RAM.

Figure I is a memory map of the top of RAM when the player missile data area has been reserved, and shows the possible conflict that may occur with the screen area if the player missile data area has been allocated too near the screen.

You can generally tell when a conflict has occurred. Strange combinations of numbers and letters mixed in with graphic symbols are seen on text screens, and odd mixtures of colours and shapes show up on graphic screens. This phenomenon is known as garbage.

Because no graphics screen occupies more than 8136 bytes – just under 8k – we could always store the player missile data area starting at 40 pages below RAMTOP. This is 10k under RAMTOP and would bring the player missile data storage area just below the beginning of the screen memory where there is no danger of conflict.

If memory is at a premium – which is especially the case with the 600XL – this can be a problem. For example, if you are using a Graphics Mode 0 screen which only occupies 992 bytes then you have effectively barred an area of about 7k that lies between the beginning of screen memory and...
the end of player missile data, which does not leave much RAM left for Basic.

If you want to conserve memory refer to Figure II which is a table of how far below RAMTOP the PMBASE need be to avoid conflicting with the different graphics modes.

In the demonstration program we are using Graphics Mode 0 which, from Figure II, we see needs a PMBASE of 16 pages below RAMTOP in order to conserve memory, avoid conflict with the screen and still leave room for over 30k of Basic programs on an Atari 800XL or around 11k on a 600XL. Line 60 performs this calculation and gives the PMBASE address to the variable PBM.

It is possible to move the screen memory to a different position in RAM somewhere below the player missile data area and allow the player missile area to be closer to RAMTOP. Most Basic programs do not require this, so it is good practice to stick to the first system to avoid conflict.

The player missile system must now be informed of where the PMBASE is. Line 700 does this by storing PMB in address 54279. Location 54279 is the place where Antic goes to find out where PMBASE is.

The 2k single resolution or 1k double resolution area is divided up into the specific data storage areas for each player and missile. Figure III is a map of how this area is allocated. All addresses in Figure III are relative to PMBASE.

In the program we are displaying a Player 0 shape whose storage area begins at PMBASE plus 1024 and ends at PMBASE plus 1279, an area of 256 bytes. The data for the Player 0 shape must be stored somewhere within this area.

You will notice from Figure II that the first 768 bytes – or 384 bytes in double resolution mode – of the player missile data area are unused by the system. I have no idea why – Antic works in mysterious ways.

These free bytes can be handy for short machine code routines that can be used to animate players. As long as the system has been initialised correctly the data stored in this free area is protected from corruption. I will show how this unused space can be put to advantage next month when discussing animation.

The program only deals with Player 0, but setting up the other players is done in exactly the same way as long as you use the appropriate registers.

It is good practice to clear the player missile area of any garbage that may have accumulated there, otherwise unwanted pixels may light up on the screen. Line 90 clears the Player 0 data area with a loop which pokes in zeros.

Once the area has been cleared we can start to load the bit-mapped numbers that correspond to our shape into the Player 0 data area. How far into the player data area we put the data determines the vertical position within the player stripe when the player is displayed on the screen.

If the data is loaded from the beginning of the data area – in other words PMBASE plus 1024 – then the shape will appear at the top of the screen.

Line 100 loads the Player 0 shape data commencing 140 bytes beyond the start of the Player 0 data area so that the player will appear 140 pixels down the player stripe, or part way down the TV screen.

This program leaves room for a 20 row player. As we are only using an 11 row design the rest of the DATA statement in line 170 is filled with zeros.

If you have designed your own

**Figure IV: Location 559 DMA Control Register**

| No playfield (switches off) | 0 |
| Narrow playfield          | 1 |
| Standard playfield        | 2 |
| Wide playfield            | 3 |
| Enable missiles           | 4 |
| Enable players            | 8 |
| Single resolution         | 16 |
| Enable DMA (switch on     | 32 |
| screen display)           | |
| Default value if no options set: 34 |

**Figure V: Colour and brightness registers**

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**Figure IV: Location 559 DMA Control Register**

| Player/Missile 0 | 704 |
| Player/Missile 1 | 705 |
| Player/Missile 2 | 706 |
| Player/Missile 3 | 707 |
| Playfield 0      | 708 |
| Playfield 1      | 709 |
| Playfield 2      | 710 |
| Playfield 3      | 711 |
| Background/Border| 712 |

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If you have designed your own

**Figure IV: Location 559 DMA Control Register**

| Black       | 0  |
| Rust        | 16 |
| Red-Orange  | 32 |
| Red         | 48 |
| Dark Lavender | 64 |
| Cobalt Blue | 80 |
| Ultramarine | 96 |
| Medium Blue | 112 |
| Dark Blue   | 128 |
| Blue-Grey   | 144 |
| Olive Green | 160 |
| Medium Green| 176 |
| Dark Green  | 192 |
| Orange Green| 208 |
| Orange      | 224 |
| Brightness range 0 to 14 (even values only). Add brightness value to colour value. 0 is darkest shade. 14 is brightest |

**Figure VI: Colour values to change colour registers**
559,34 switches the screen back on, to hopefully display the correct answer to whatever task you have set the computer.

Even though the demonstration program does not use missiles I have included the enable missile option. It is not strictly necessary, but it does no harm. The program is designed to represent a standard player missile initialisation, adaptable to many other situations where you need to set up the system.

Line 120 sets the colour of the player. The memory locations associated with player missile graphics are often called registers. Figure V is a list of the colour registers, and the values that can be poked into them are listed in Figure VI.

In line 120 the colour chosen has a value of 204 which is made up of medium green (192) plus a brightness level of 12. This number is then poked into location 704, the colour register for Player 0.

Line 130 sets the horizontal position of the Player 0 stripe to 140 so that the player will appear near the centre of the screen. Try altering line 130 to a different value — between 0 and 255 — and see what happens.

Figure VII gives the horizontal registers for the other players and missiles. It is important to set the horizontal register. If not set, the register value defaults to 0, which means that the player stripe is so far to the left as to be actually off screen.

Now all that is required is to throw the switch that turns on the player missile graphics. This is done in line 140 by POKE 53277.3. Voila — the bug appears.

Three options are available with register 53277. A value of 1 turns on the missiles only, 2 turns on the players and 3 turns on both players and missiles. Again it is unnecessary to turn on the missiles if they are not needed, but I do so as a matter of course.

In this program no data has been loaded into the missile data area, so no missile will appear, and even if some stray bytes of information have crept in, because the horizontal positions are still at 0 — their default setting — they will still not appear and spoil the look of the display.

As mentioned before the purpose of the demonstration program is to show how to perform a fairly standard initialisation operation for the player missile system.

Setting up the system can be a little tricky. Forgetting to set one register, or putting the shape data into the wrong area can stop the system working properly.

Perhaps the best means of finding your way around the initialisation process is to experiment with the program, changing it and adapting it to suit up a different player, with a different shape, colour and position on screen.

Try displaying more than one player at a time, or switch on a double resolution player. Trial and error methods often work wonders.

You will note that the bug does not actually do anything in the program. It is pretty lifeless, just sitting there playing dead. Next month I will breathe life into it by means of animation.
THE Sunshine State is the source of new software this month. Florida is the home of Disneyworld, Miami Vice, the Everglades and Scott Adams of Adventure International.

Scott is about to release his first title for the Atari ST in the form of Spiderman. I am not the greatest fan of Adventure International, as I don't think they have really advanced in the field of software design.

Apart from the scrolling graphics controlled by the mouse, Spiderman does not look that much different from the 8 bit version.

I would not pay money for this title. Although it works in both mono and colour, the mono hi-res mode is very disappointing.

For lovers of Print Shop on the XL/XE, Unison have produced a very similar program on the ST called Printmaster, which will design letterheads, banners and signs.

You can print in a range of font styles, and there are a large number of pictures which can be incorporated into your design. You may also design your own pictures and store them on a data disc. At $39.95 this is a very useful package indeed.

Moving back to Print Shop, news of a new data disc has just arrived, although no other details are available apart from the price, which is $9.95.

Microprose Software has released a war game simulation for the ST called Conflict in Vietnam as part of their new command series. This simulation gives you the option of taking charge of either the free world or the communist forces.

Activision have finally released the long-awaited Music Studio, but you will need a colour monitor to run it.

The package contains a music paintbox where you may doodle with notes and experiment with different compositions. The program can drive the Midi interface which will allow you to connect your synthesiser to the ST.

When you have completed the composition you can even add lyrics and save the lot to disc. This application could be ideal for educational purposes. Activision UK should have it ready soon and it will only cost you $49.95.

It is a comfort to see that it is not only American software that is being distributed in the States, the Brits have landed as well.

Software written in the UK is making a significant impression on the market. Laser Software International have managed to score heavily with Laserbase, and Mastertronics and Firebird are doing well.

Because the ST is a relative newcomer we do not often see the real top end business applications programs. However, Abacus of Michigan has written a very powerful electronics design tool, PC Board Designer, a true CAD program.

Enter your design parameters and the computer will modify them for you. You may position components by using the mouse and move them around to make them fit into the best position.

The most powerful feature of the program is the tracing aspect, where the computer will draw the tracks of a pcb very accurately.

At $339.99, it is not a program that everyone will clamour for, but it sure will be an advance for the ST.

I received an interesting call from Chicago this morning from a company new to the Atari scene, Mark Williams Co. They have been producing software for the Macintosh and have now turned to its rival, the ST.

They have two titles ready for release. The first is a C compiler purported to be the best thing since salami and rye, and they will also be marketing a new language called Coherent.

Not much is known about these titles but I should have more details next month.

Action Software Supplies, a new distributor of ST software in the UK, has negotiated a deal with a number of small software houses in the States to import products which would not normally be seen over here.

The programs range from games to specialist business applications. Details are scarce at present but news should break soon.

A metamorphosis has taken place with two titles from the 8 bit stable: Joust and Battlezone have been converted to run on the 520/1040.

Atari is the culprit, but I am very happy to see my favourite game Joust on the new machines.

The game play is similar to that on the old machines and the enjoyment is as it was when I first booted these programs from my 810 disc drive.

The prices are reported to be $39.95 each.

On the 8 bit front Beach Head 2 from Access should be winging its way across the ocean soon, and it won't be long before US Gold has a cheaper UK version available. This is no different from the version that was released for the Commodore 64 and Sinclair Spectrum over a year ago.

My advice would be to wait for the US Gold version rather than pay about £35 for the imported one.

Some new titles to look for are N-Vision by Activision. Rogue from Epyx and Universe II from Omnitr. More details next month.
This month's game takes us once more into the realms of outer space. Your task is to pilot a small one-man spaceship around the hazards of an alien planet.

There are four stages, each a little harder than the previous one. First manoeuvre your ship between the rocky outcrops into the cavern below.

You may consider collecting some fuel as you go - you'll certainly need it later!

Next you must navigate the tunnels - but don't hit anything - down to the next level. Again, don't forget that vital re-fueling point.

In the third level you have to steer your way around the asteroids and down to the fuel point. But where do you go from there? There is only one exit, and only one way to it...

The fourth level is the hardest of all, and we're not giving you any hints.

Controlling your ship is simple. Push left or right on the joystick to steer, and forward to use your main engines to go up.

You can give a quick burst on the main engines to stop moving left or right, and gravity will always pull you down if you don't do anything else.

The game is written in Basic, with a machine code routine to move the spaceship player vertically. The screens are drawn, using a redefined character set, in Antic Mode 4, which allows for all the colours required.

Make sure that you type all of the numbers in any DATA statements exactly as printed, or you may crash your machine and have to start again. Always ensure you have saved a copy before trying to run it.

Be especially careful when typing in the ? statements in lines 1370 to 2330. Make sure you get the right number of spaces so that the ends of the lines in each of the four blocks match up with each other.

We have printed these lines slightly wider than normal to help you to see the spacing better, but don't forget that they will overlap on to TWO screen lines on your TV set.

You will find de-bugging much simpler if you can run a printout in 80 column format to see the whole line at once. If you don't have a printer, try typing POKE 82,0 to set the left screen margin to zero, thus showing you two more characters per line than normal. (This is a good tip for typing in those "long" lines in programs which just don't seem to fit.)

The checksum will always let you know if you have made any mistakes.

By Steven Davies
420 FUEL=FUEL+10;SC=SC+2;POSITION 2,0;7 FUEL 430 IF FUEL>360 THEN POKE PDIR,11:GP= 0.41;RETURN 440 FOR T=1 TO 60:NEXT T 450 GOTO 400 460 REM 470 REM 480 GR=5:GR=GRAPHICS:POKE S,559:OUHDB 490 POKE 710,74:POKE 768,74:POKE 789,0 500 POSITION 15,11,W;"SPACE MAZE" 510 POSITION 12,7,W;"YOU NEVERS LEAV 520 POSITION 12,17,W;"PRESS STAR KE 530 POSITION 13,11,W;"TO PLAY GAME" 540 POSITION 13,12,W;" 550 POKE PDI,11:POKE S,559:OUHDBFOR T=1 TO 500:NEXT T 555 FOR T=200 TO 63 STEP -1:POKE PDI,T 560 NEXT T 570 FOR T=6 TO 213:POKE PDI,T,NEXT T 575 POSITION 11,1,W;"BY STEVEN DOVE" 580 POSITION 0,0,0:POKE 718,18:POKE 768,14 590 FOR U=50 TO 60 STEP -1:POS188,0,5,1,0,5;NEXT U:GOTO 620 600 REM 610 REM 620 GRAPHICS 14:WHEN YOU HAVE FAI 630 POKE PDI,POKE PDI,0,POKE PDI+2,015;SC}TSC7TSC150;OI 640 POSITION 4,6,W;"HIGH SCORE:" 650 POSITION 4,7,W;"N 660 POSITION 4,12,W;"PRESS START K 670 GOTO 620 680 REM 690 REM 700 IF PEEKEX29976 THEN LIFE=3:SC=0; 710 POKE 159,156:GOTO 158 720 GOTO 620 730 REM 740 REM 750 REM 760 REM 770 REM 780 REM 790 REM 800 REM 810 REM 820 REM 830 REM 840 REM 850 REM 860 REM 870 REM 880 REM 890 REM 900 REM 910 REM 920 REM 930 REM 940 REM 950 REM 960 REM 970 REM 980 REM 990 REM 1000 REM 1010 REM 1020 REM 1030 REM 1040 REM 1050 REM 1060 REM 1070 REM 1080 REM 1090 REM 1100 REM
LET'S look at how to get useful signals out of the joystick ports and how to amplify them so that they can switch external appliances on and off under software control.

With the power switch described you can make animated models, control a train set, drive low-voltage disco lights or operate equipment designed for use in car, caravan or boat.

The switching action can be controlled directly by your software, manually from the keyboard or by an external sensor such as the light-activated switch described last month.

First let's look in detail at setting up the joystick ports. Each one has four signal lines — pins 1 to 4 — which can be made to behave as outputs by Program I.

Line 10 notifies the computer that you are about to change the way ports 1 and 2 are handled, line 20 specifies that all eight signal lines are to be treated as outputs and line 30 sets 54018 back to its original value, with the new rules operational.

Line 40 clears the switch register, making sure all the signal lines are off. From then on, any number you poke into 54016 will appear as a pattern of high — and low — off — voltages on the output pins of ports 1 and 2.

Table I shows the numbers to poke for all possible on/off combinations at port 1. Each line has its own unique number — 1, 2, 4 or 8 — and by adding these numbers together in different combinations you can control each output independently.

Numbers higher than 15 will bring port 2 into operation. Pins 1, 2, 3 and 4 in this port are controlled by 16, 32, 64 and 128 respectively, as shown in Table II, and these numbers can be combined as before.

For example POKE 54016, 195 — or 1+2+64+128 — will switch on pins 1 and 2 at port 1 together with pins 3 and 4 at port 2. Similarly POKE 54016, 150 — or 2+4+16+128 — will switch on pins 2 and 3 at port 1 and pins 1 and 4 at port 2.

Any pin which is not specifically selected will automatically switch off when you poke a new number into 54016.

When a pin is on it carries 5V, and will supply 0.5mA. When it goes off the voltage drops to 0V, but it can pass 15mA in this state.

You can't do much with such tiny signals, and in any case it isn't wise to connect loads directly to the joystick port. But both of these problems can be overcome by using a transistor.

There are many different species of transistor, but for the moment we'll concentrate on the bipolar kind, which come in two varieties — PNP and NPN. Figure I shows the circuit symbols for both, together with the pin-outs for the two types we'll be using.

Both types have three leads — collector, base and emitter. In each case a small current flowing in the base will enable a much larger current to pass between collector and emitter.

The current can flow only one way — from positive to negative in the direction of the arrow — so it doesn't behave exactly like a switch, but the effect is similar.

A PNP transistor turns on when its base voltage is at least 0.6V, lower than its emitter voltage, whereas the NPN variety needs the base to be at least 0.6V higher than its emitter.

Actually it's a lot more complicated than that, but we don't want to get into transistor theory at this stage.

Figure II shows how you can use an NPN transistor as a simple current amplifying switch. The load is a light-emitting diode — those small red:

<table>
<thead>
<tr>
<th>Number in 54016</th>
<th>Pin 1</th>
<th>Pin 2</th>
<th>Pin 3</th>
<th>Pin 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>1</td>
<td>On</td>
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<td>15</td>
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</table>

Table I: Output switching

<table>
<thead>
<tr>
<th>Pin number</th>
<th>Port 1</th>
<th>Port 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
<td></td>
</tr>
<tr>
<td>Control number</td>
<td>1 2 4 8 16 32 64 128</td>
<td></td>
</tr>
</tbody>
</table>

Table II: Switch control numbers
lamps on your keyboard, cassette recorder and disc drive are LEDs — and its only purpose is to indicate on or off.

When pin 1 goes to 5V the transistor switches on, allowing current to flow through the LED. Nearly all the power comes from pin 7 — less than half a milliamp is required at pin 1 — and the transistor acts as a kind of buffer, protecting the signal line.

Because they are so small, transistors and LEDs can be very fiddly to wire together, especially if you’re not too happy about soldering.

The easiest solution is to use a solderless breadboard, like the one in the photograph. Each hole contains a spring-loaded electrical contact which can grip a wire or a component lead.

The contacts are connected together in rows of five, and there are longer strips of interconnected sockets at the edges, for use as power supply lines. You simply plug components into the breadboard and take wire leads from the adjacent holes.

Screw the breadboard onto your plywood base, and wire everything together as in Figure III. Use single-conductor insulated wire — not the stranded type — as the bared ends will push into the breadboard holes more easily and you won’t get broken strands coming off inside.

The LED won’t work if it is fitted the wrong way round — the cathode is indicated by a flat on the LED body, and also by a shorter lead. Run Program I, then type:

POKE 54016, 1

and the LED will light.

Atari’s technical reference notes specify a maximum current drain of 50mA from the joystick ports, and you must not exceed this under any circumstances.

In fact, the internal power supply starts showing signs of distress at about 20mA, so it’s best to keep at or below this level if possible.

Therefore, to drive anything worthwhile you will need an external power source capable of delivering higher voltages and currents. A battery or a power supply unit will do, and 12V is sufficient for all the gadgets we’ll be describing this time.

A BC108 transistor can’t handle more than 100mA so an extra amplification stage is needed. The circuit in Figure IV shows how to add a second, much more powerful, transistor.

When TR1 switches on it supplies base current to TR2, which in turn handles all the power for the load.

If anything should go wrong with the battery circuit the two transistors prevent high voltages getting back to the joystick ports, so the risk is minimised.

The output of this switch is in
Figure III: Breadboard layout of simple switch

Phase with the input - a positive voltage on the signal line produces a positive voltage at the collector of TR2.

If the load is an electromagnetic device - such as a relay, solenoid or motor - it will generate high voltage spikes on the power lines, which could damage the output transistor.

The diode D1 is used to suppress these, and it must be wired as shown with cathode to positive or it will self-destruct. The case has a black or coloured band to mark the cathode end.

Figure V shows how to wire everything up without soldering, using a miniature terminal block. The transistor leads are quite short, so you will need the smallest block you can find - not more than 8mm between terminals.

Be extremely careful when bending the leads of the TIP127. They have a flat cross-section and will break very easily if you try to bend them across their width, but a half-twist will help them round the corners.

The power transistor is rated at 5amps, but it gets very hot when controlling 1 amp or more, so some form of heat sink is necessary.

The twisted vane type is adequate for loads up to 2.5 amps (25 watts at 12V), but heavier loads require larger heat sinks - a 5°C per watt type will enable you to draw up to 5 amps.

You can buy one of these, or make your own from a piece of scrap aluminium - about 50 square centimeters of 3mm plate or angle should be adequate.

A touch of silicon grease will improve the thermal contact, but isn’t strictly necessary so long as the surfaces are clean and the transistor is bolted down securely.

Because the first transistor places such a small load - about 1mA - on the joystick port you can have a power switch on every signal line, giving you eight independent channels.

Now we have something really useful. You could construct animated Lego or Meccano models, moving displays for shop windows or even simple robots.

You could control up to eight separate tracks - or points switches - on your model train set, and program the whole layout like the London Underground.

A safe disco display for children can be made from 21 watt car indicator bulbs. Or you might use 12V pumps or solenoid valves to construct an automatic watering system for your conservatory.

Remember, though that the exter-

Figure IV: Low-voltage power switch
nal power source must be able to supply enough current. A car battery charger is worth trying, or you might use an old car battery itself.

Take the usual care to avoid sparks and excessive currents which could start a fire. Under no circumstances should you attempt to connect this circuit straight to the mains.

The power switches can be operated by external sensors rather than a fixed program. We’ll be describing many different kinds – temperature, sound, humidity, movement and others – in a future issue.

For now you could try the cadmium sulphide cell we looked at last month. Wire it between pin 9 and the free end of the 50mA fuse, then use Program II to switch the load on when it’s dark and off again when it’s light.

Line 20 sets the switching threshold L, and you can reverse the action by changing the > at line 40 to <.

You could use this device to set an intruder deterrent system into operation at dusk. How about a gadget which switches low-voltage lamps and off in random patterns to give the impression that your house is occupied while you are away?

A word now about buying all the necessary bits and pieces, which can be a problem, especially if you are relatively new to the game. It’s all too easy to pay over the odds, or end up with the wrong thing since components which look alike may have totally different specifications.

For things like transistors, resistors and other small components the easiest and safest method is to use one of the big mail order companies. They all produce catalogs – some better than others – containing photographs and specifications.

We’ve tended to quote order codes from Maplin Electronic Supplies because they are among the less expensive quality suppliers, and their catalog is readily available from W.H. Smiths. Other mail order companies

**Figure V:** Construction of the power switch
advertise regularly in the monthly electronics magazines.

Some High Street audio stores, such as Tandy, also supply a limited range of electronic components.

They are useful for certain unusual items like the joystick extension lead, or for things you need in a hurry, but you'll usually pay more for them and the shop assistant is unlikely to be very knowledgeable.

Try your local scrap yard for bargains in 12V electro-mechanical equipment, such as windscreen wiper motors, door-locking solenoids and headlamp relays.

Caravan, camping and boat shops can also supply a wide range of suitable gadgetry, and most electronics magazines advertise surplus and ex-equipment devices which are fine for low-voltage experimentation.

How about mains appliances? Transistors cannot handle the very high voltages and currents involved, so you can't use the circuit of Figure IV to switch on your electric blanket, control your central heating or turn the TV off when you've fallen asleep over the keyboard.

Besides which, you and your computer need much more protection from mains AC than from low-voltage DC circuits.

- Next month we'll start talking about constructing an opto-coupled mains switch box, with two independent channels.

### PARTS LIST

- 1 battery, 6V to 12V, with clips to attach leads, 1 5mm (Red) light-emitting diode (Maplin WL27E; Tandy 276-041).
- 1 Verobloc solderless breadboard (Maplin YL11M), 1 BC18 transistor (Maplin QB32K).
- 1 TIP127 transistor (Maplin W07R4).
- 1 N4148 diode (Maplin QL80B), 1 high-power twisted-vane heatsink (Maplin FG55K).
- 1 cadmium sulphide cell: ORP12 or similar (Maplin HB10L; Tandy 276-116).
- 1 joystick extension lead (Tandy 276-1978).
- 2 small terminal blocks (Radiospares 423-166 or similar).
- 1m single-conductor connecting wire, up to 0.6mm core diameter, 2m 5amp low-voltage flexible wire (car accessories shops).
- 0.25 watt carbon resistors [colour codes in brackets]: 1 100 ohm [brown/black/brown], 1 1k (1000 ohms) [brown/black/red], 1 10k (10,000 ohms) [brown/black/orange].

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**July 1986 ATARI USER 35**
LAST month I promised to have a look at the adventures of Jym Pearson, but before I do that a quick round up of adventure news.

At last, now courtesy of US Gold, come the Thing and the Human Torch in Questprobe III by Adventure International, alias Scott Adams. If my review copy has reached me in time then I shall be looking at that one next month.

The same applies to The Price of Magik from Level 9, the follow-up to Red Moon. The poster boasts even more improvements in the number of locations, independent characters and spells you can cast. Also it claims very few bugs. Brillig's glitch hunters keep even the best on their toes!

Bally-Hoo from Infocom sends you on a quest to save the daughter of a funfair owner from who-knows-what, and should be up to the normal superlative Infocom standard. That is another feature for next month's round up of new goodies.

Finally, I had a nice play with an ST the other day and thoroughly enjoyed Borrowed Time from Activision, a very good graphic adventure, where you play a private investigator in trouble with some villainous characters.

I enjoyed using the mouse to select words and objects - much easier than typing them in - but the advertised price, £49.95, seems a bit steep for a game.

Now on to a request from A.R. Morris about the games of the aforementioned Jym Pearson. Do I know of any others apart from Escape from Traam and Curse of Crowley Manor?

Of course I do. But first, for the uninitiated, a quick look at the two games he mentions.

Crowley Manor is my favourite Pearson offering, released by Adventure International a few years ago. In it you play a Scotland Yard detective travelling to a mysterious manor where all sorts of grim and gruesome discoveries are to be made.

As with all of the Otherventure series, the layout is very simple and highly irritating. Visible objects appear at the top, a location description in the middle (next to the title), followed by your inventory, and at the bottom of the screen a space for messages.

The vocabulary is extremely limited compared with today's games, which probably explains why it will fit into the 16k Atari 400. For instance, 'Get' is understood but 'Take' is not. All this might lead the player to believe that 'I don't understand' is on constant display in the message area.

Despite the seemingly simplistic vocabulary the games compensate by having some very obscure commands too. In Crowley Manor although Climb cab gets you into the cab, it will take Get out to do precisely that. One experienced adventurer I know spent several weeks trying to do just that without succeeding.

With the above proviso, the game has a good atmosphere considering the brief descriptions, and there is plenty to explore.

Exploration in these games is something else, however. I can forgive an adventure writer almost anything, but to write games with no directions displayed is downright painful.

The most tedious part of these games is the fact that you cannot just glance at the screen to see which way to go. Pure navigation should not be part of the mystery!

Escape from Traam is a game which I never really got into. The scenario, in which you have crash landed on a planet and have to escape, never gripped me enough to believe in it, and the limited vocabulary finished me off.

The game employs a technique used quite a lot in this series. After a few moves the ship crashes no matter what you do, and you are flung clear. Frankly, I wish I'd gone down with it.

In San Francisco 1906 the random event turns out to be an earthquake (historically accurate if nothing else). At the time you are locked in your hotel bedroom with a ransom demand, a wad of bills and a crowbar which is incapable of prizing open the
Glitches of the Month:

It is wholly appropriate that this month's glitch, from R.C. Bassett of Tilbury, Essex should be from Escape from Traam.

After finding the nylon rope in the wreckage of your spacecraft (all spacecraft carry rope don't they!) you stand at the bottom of a cliff. You'll fall if you try to climb it unaided, but there is a stout bush at the top.

Tie rope to bush means you can then climb happily to the top of the cliff. But if you can tie the rope to the bush, why bother?

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July 1986 ATARI USER 37
ONE of the reasons for choosing an Atari 8 bit computer is for its superb graphic capabilities when compared to other 8 bit home computers.

Among the recent crop of programs that explore the world of Atari graphics are Technicolour Dream from Red Rat Software and Databyte's Graphics Art Department, or GAD for short. Both programs allow you to paint pictures on the screen with a joystick. Technicolour Dream will also accept input from the Atari Touch Tablet.

The most impressive feature of Technicolour Dream is its vast range of colours. All 256 that make up the Atari palette can be displayed on the screen at the same time. There is also a choice of 128 filters, which are similar to lens filters on a camera. For example if a red filter is used all the colours on the screen are tinged with red.

Colours can also be mixed, plotting pixels of one colour next to pixels of another. Viewed close up this gives a patterned effect, but seen from a distance the colours appear to merge to form a mixed colour.

By using filters and colour mixes it is claimed by Red Rat Software that it is possible to create over eight million different shades for your Atari. I've certainly found colours that I never thought possible.

An effects option allows you to change colours already on the screen, altering such things as overall contrast or individual colour values. Pictures can be stored to and loaded from disc. Some demonstration pictures are included with the Technicolour Dream package and my review copy came with a disc containing further pictures created using Technicolour Dream, most of a high standard.

Technicolour Dream pictures have a "tapestry" look to them due to the fact that pixels are plotted every other row only, leaving a thin blank between. This is due I suspect, to the way that the 256 colours are put on to the screen by a process that merges two graphic mode screens, one for luminence, the other for brightness.

To assist you when you are drawing there is a line command to plot lines between designated points. This is the only drawing command available. There are none of the usual options associated with drawing packages, such as circle or fill.

Technicolour Dream is not very user friendly. It took me a while to work out how to use some of the options - particularly in the effects section. This is not helped by the manual which says such things as: "These commands move the 4 bit data 1 bit to the left or right". I am told that the manual is due for revision so hopefully some of the commands will be made clearer.

At the time of writing Technicolour Dream is available on disc only at £12.95, but a cassette version at £9.95 will be out soon.

Graphics Art Department is a powerful and versatile graphics package that should provide just about every option the computer artist should ever need.

A good test for software of this type is to try it out on someone who is not used to using computers. I have been using GAD extensively for the last few days to design graphics for a game. Helping me were two artist friends who do not normally have anything to do with computers. They
Electronic outlet for artistic expression

STEPHEN WILLIAMSON tries his hand at two painting programs for the Atari

found GAD a joy to work with and did not take long to master the techniques required to use it.

GAD has a multitude of commands but has a menu driven control system that makes operation easy. My friends especially appreciated the zoom option which allows selected areas to be magnified at one of three levels of magnification to make plotting or erasing individual pixels much easier.

Normally four colours are available selected from a 128 colour palette. To increase the number of colours display list interrupts can be instigated. After selecting an area for the display list interrupt to begin and choosing the new colour then the new shade will appear whenever a pixel is plotted below this point. This is not as versatile as the "256 colours anywhere" method employed in Technicolour Dream but for most practical purposes 128 colours are enough.

There are 40 different brushes to choose from, ranging from the very large for filling big areas of colour to brushes that draw parallel lines, and brushes for dabbing on small solid circles.

If the brush selection doesn’t suit you an editor facility allows you to design your own. Any so designed can be saved to disc and loaded again at a later date.

GAD uses a Graphics 7 screen with a definition of 160 x 80 pixels, which means that the size of the smallest brush is one pixel. A Graphics 7 pixel is more or less square which makes it easier to calculate proportions and angles but does restrict picture definition when compared to say a Graphics 15 picture with its smaller, but thinner pixels.

There are commands to help in drawing geometric shapes such as circles, triangles and rectangles. They can be outlines or solid shapes filled with one colour or a pattern chosen from a pre-set selection. The patterns can also be used during the fill command and, like the brushes, can be edited and re-designed to your own specifications, then saved to disc if required.

Shapes are drawn using a rubber banding facility which lets you view, move or enlarge the shape before pressing the fire button to fix the image on the screen.

Areas can be inverted to create a negative image, rotated, mirrored or moved. My friends wanted to plant a forest in front of a mountain scene. To do this just one tree needed to be drawn. Then, using the block move facility, the image of the tree was moved to various points on the screen and repeatedly planted to form the forest.

Text can be printed on the screen at any point. A standard print font is included, and an edit mode enables custom designed letters to be produced and saved to disc if required.

Pictures can be scrolled in any direction. This helps centre a picture on the screen. I found it impossible to make a mistake on a picture that cannot be rectified in some manner. Undo is a marvellous option that restores a picture to its previous state before the last command. This is great for "unfilling" areas. The fill command on some graphic packages can be frustrating. If the area to be filled is not completely sealed the fill leaks out with disastrous consequen-
ces. Undo simply brings you back to the unfilled state before the mistake was made.

Pictures can be saved and loaded on disc and hard copy dumped to a printer. GAD is set up to be compatible with Epson, Gemini and Prowriter printers with the option to customise it to work with other makes. I tried to make GAD talk to my Atari 1029 printer but without success. Perhaps I entered the wrong printer control code data – or it could be that GAD just will not work with the Atari model.

Technicolour Dream's print option is designed to work with an Epson RX80 or compatible model. The poor Atari printer gets left out again.

Other GAD commands cover brush speed, rainbow colour rotation, ellipses, clear screen, jump to a point and kaleidoscope mode. There are many more.

Both GAD and Technicolour Dream pictures can be incorporated into your own programs. The Technicolour Dream manual provides a short Basic routine to load pictures, while GAD has a machine code routine that can be copied from the GAD disc as a DOS binary file and then accessed from Basic using a USR command. Both methods are straightforward and do not demand complex programming knowledge. GAD's machine code routine makes it possible to load GAD pictures to a machine code program without much trouble.

The Art Gallery section of GAD enables you to set up your own picture gallery of GAD pictures to show your friends.

Graphics Art Department costs £29.90 on disc only. This is over twice as much as Technicolour Dream, and at the top end of the Atari software market.

If you want to experiment with colour and draw pretty pictures, and also have a limited budget, Technicolour Dream is fine if you can accept its limitations. On the other hand if you want to do some serious graphic work and need a flexible graphics package then fork out the extra and buy GAD, it's well worth the money.

In an ideal world I'd love to see a graphic package that combines the best of Technicolour Dream and GAD – Technicolour Dream's vast colour palette and smaller pixels, but without the inbetween blank lines, together with GAD's versatility. In the meantime I'll get back to creating my GAD art masterpiece. If only it could handle animation as well...
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MUCH has been said over the past couple of years about the bugs in Atari Basic Revision B. I present here Rambas, a short machine language routine which will cure the most serious flaw—the infamous lock-up which can occur when entering programs.

Many remedies have been suggested to alleviate this problem. Many are time consuming, most are inconvenient, and none are the stuff which makes for happy computing.

What is required as the definitive solution is a new and bug-free Basic interpreter. Short of paying out extra money for Revision C Basic from Atari, or Basic XL from OSS, the problem would seem to be irresolvable.

Not any more! You too can be free of the lock-up problem for good. If you have a disk drive you can save the routine as an AUTORUN.SYS file and never even see the change. Alternatively, for cassette users, the routine can be modified and saved as a Basic loader program.

The Basic interpreter is contained in rom. In the XL range this rom covers an area of free random access memory. When the computer is first switched on it is normally the Basic rom which is enabled; the ram area is merely a shadow and is rarely used.

If the Option button is held down during power-up then the operating system will disable the rom and allow access to the ram.

A machine language routine can easily move the entire contents of the Basic rom down in memory, enable the shadow ram which lies under the Basic interpreter, and move Basic back up to occupy its former position. Once this has been done it is possible to alter the Basic interpreter and put right some of its faults.

It is well known that the lock-up problem is caused by a fault in the EXPAND routine which is designed to move the Basic program tables down in memory very quickly. This was changed from its Revision A counterpart in a mistaken attempt to put right another bug. Actually it was the CONTRACT routine which was at fault. That bug was corrected in revision B but EXPAND was fine as it was and should have been left alone.

If the disassembly of the Basic rom in an XL machine is compared with the EXPAND routine in The Atari Basic source book from Compute! Books, it is easy to see that the EXPAND routine differs significantly by only four bytes. If the EXPAND routine is amended as it originally did, the lock-up problem will be solved.

Listing I gives the entire Rambas routine in assembler. Included in the listing is code to stop the computer after Reset depends on which peripherals were booted, if any. If a cassette boot was successful the operating system will jump to the address held in CASINI (the cassette initialisation vector, locations $2$ and $3$).

If a disk boot was successful the jump will be to the address held in DOSINI (the disk initialisation vector, locations $SC$ and $SD$).

By intercepting the disk initialisation vector and making it point to the RESTART code, the ram-based Basic is made permanent even if Reset is pressed. The RESTART routine re-enables the shadow ram and jumps to where the disk initialisation vector originally pointed, in order to pass control back to Basic.

Cassette users must fool the operating system into thinking that a peripheral was booted by setting BOOT? to one. At the end of the RESTART routine control is passed back to Basic by jumping directly to the Basic warmstart routine.

Disc users have two different ways of implementing Rambas.

If you have an assembler you can type in the assembly listing from Listing I and assemble the routine into ram. Alternatively you can type in and run Listing II, which is a Basic loader program containing Rambas as data statements. Either way you should go to DOS in order to save the routine as an autorun file.

To do this, type DOS and use option K (binary save). In response to the prompt, give the following save parameters:

**AUTORUN.SYS,600,678,600**

[Return]

The routine will then be saved as
an autorun file and the start address will be specified as $0600.

Whenever you boot the disc with this file present the transfer routine will be automatically loaded and run and the amendment to Basic will be quite invisible to the user.

The Rambas transfer routine can be made to work on cassette-based systems with only a small modification.

If you are a cassette user type in the Basic loader in Listing II with line 10100 modified as directed in the listing. Don’t forget to save the program to cassette using CSAVE before you test it. An error in the data will probably cause the machine to freeze and you will have to switch off and power up again to regain control.

The program should be loaded using CLOAD, and run immediately after power-up. There will be a short pause and the familiar READY message will appear.

Since Basic has been restarted with a coldstart, all traces of the loader program will be gone and it will be unnecessary to give the NEW command to clear the memory before proceeding. You should now have no more problems with lock-ups.

Correcting bugs is not the only use for a ram-based Basic such as I have described. If you study the Basic disassembly you will probably see many ways in which Basic can be
altered or improved. I hope these suggestions will give the interested reader some food for thought.

- Altering the error handling routines to give meaningful error messages instead of error numbers.
- Rewriting the program editor to give greater freedom of movement around the stored program.
- Adding extra commands to the interpreter, for example commands for handling player/missile graphics.

Listing II

```
10 REM RAMBAK By Robert W. Gare
20 REM ATARI USER, JULY 1986
30 REM
40 REM
50 REM
55 REM CASSETTE USERS, PLEASE
60 REM TYPE LINE 10100 AS FOLLOWS
65 REM
70 REM
75 REM
80 REM
85 REM
90 REM
100 RESTORE
110 ADDRESS=1516
120 READ DATA
130 IF DATA=1 THEN G=USR(1516)
140 POKE ADDRESS,DATA
150 ADDRESS=ADDRESS+1
```

160 GOTO 120
1000 DATA 162,12,160,2,185,0,160,151
10020 DATA 162,12,160,2,185,0,160,151
10030 DATA 162,12,160,2,185,0,160,151
10040 DATA 111,7,2,141,1,211,162,32
10050 DATA 160,8,160,0,56,152,0,160
10060 DATA 200,200,247,230,25,6,230,39
10070 DATA 1,282,200,216,169,240,141,2
23
1100 DATA 160,165,16,141,224,140,165,160,
224
11020 DATA 141,225,160,141,226,160
11030 DATA 165,12,141,116,6,165,13,141,
119,6
1010 DATA 169,100,123,12,169,6,132,13
10120 DATA 169,0,141,68,2,169,1,132
10130 DATA 9,76,9,150,173,1,211,9
10140 DATA 2,141,1,211,169,0,141,46
10150 DATA 2,165,1,123,9,76,77,160
10160 DATA -1
```

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It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.

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Signature

Date

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WITH reference to M.A. Philp's letter in the April issue of Atari User I can confirm that 800Xls with Rev C Basic in them are available in the UK - I have one.

I bought a Disk Drive 800XL package in Dixons recently and was having problems with the keyboard locking up after a lot of typing. I wrongly assumed this was my fault until I read about the bugs in your March issue. I pecked location 43234 and found I had Rev B Basic.

However, what really annoyed me was that a colleague at work had bought a similar package a few days later at a lower price and got Rev C Basic.

The moral is before buying an 800XL package check that you get 234 and not 96. - Gareth Foster, Whitton, Middlesex.

Mine's a 234 too!

WITH reference to your comment on M.A. Philp's letter in the April Mailbag, I have a bundled 800XL Pack, and on reading about the bug at 43234 I checked the address to find the contents were given as 234. - M. Smith, Dartford, Kent.

Thanks for letting us know.

If you have recently got an 800XL and you don't get an answer of 234 if you PRINT PEEK(43234) then you probably have an older machine.

Take it back to your dealer and ask him to provide you with the up-to-date version, as the Revision B machines have some bugs in them.

Our thanks to everyone who wrote in to us telling us about their own Revision C 800Xls, including James Kelly, Mr A. Boardman, Elber Ozkan, Mrs S. Woodward, P. Stallard, Alan Norman, T.H. Ralphs, David Freath, Julian Madison, P. Abbot and many others too numerous to mention. You can stop writing now... please.

Screwdriver solution

REGARDING F. Ward's letter about the £20 play button on the 1010 recorder I have had this happen twice, the first time just five days after the guarantee ran out.

I duly took my recorder along to Silica Shop who quoted, yes you guessed it, £20 for the replacement. Having no alternative I handed over my crisp £20 note and my 1010 became operable once more.

After about another 12 months it happened again, this time before parting with the readies I questioned one of the salesmen. After torture he broke down and confessed that it was possible to fix the recorder by myself.

So having gained some electronics experience I decided to have a go, I went back to questioning the salesman who by now was a quivering wreck.

I asked the price of a new button, half expecting the price to be in double figures, but was flabbergasted when he told me £1.12. After picking my chin up off the floor, I found out how it was fitted.

Firstly unscrew the four base screws and separate the top from the bottom. Then locate the buttons inside - not hard. Remove the locking circlip on the rod around which the buttons pivot, then push the rod through the bracket and pull out the rod and buttons.

Slide off the buttons and replace the broken key with your new one. Replace rod into the chassis, replace the locking circlip and finally place the two halves together and do up the four screws.

Easy - honest it took me about a quarter of an hour.

I don't recommend this to be done when the recorder is still under guarantee but for those people handy with a screwdriver, whose units have expired, it's a great money saver.

Silica have admitted these buttons are notoriously weak. So come on Atari, £20 for a lump of plastic is just not on!

I hope my letter helps people and saves them a lot of unnecessary expenditure. - Ian Sibthorpe, Bexley Heath, Kent.

Key pinned

IN the March issue I was surprised to read about the £20 button by F. Ward.

The same thing happened to me when I pressed the Play key on my recorder - it just snapped. I opened my recorder up to see what damage I had done, only to see the key in two halves.

I thought on it for a while and decided to replace the broken Play key with the Pause key.

This was not too difficult - just a matter of removing the metal cassette mechanism from the top half of the unit and removing a small circlip washer from the key rail.

It was then simple to switch the key positions and thus give me time to think of some way to mend the broken key. I tried glue, but after setting for two days the key fell apart under use.

I then thought of drilling a small hole - using the smallest drill I could find - up the centre of the two halves, and pushing a panel pin into them. I put a spot of glue on them before bringing the two bits together, just to make sure.

The result was a stronger key that before, and a simple wire nail saved me up to £20 into the bargain. - Barry Nelson, Lisburn, County Antrim.

Two good ideas, but don't forget that doing these repairs yourself will void the manufacturer's guarantee. So if it is within 12 months of purchase, take it back to your dealer.

Graphics artists

THANKS for printing three of my screens in the article on ST graphics in your May issue.

The quality of the screen shots was quite good, but I was a little disappointed to see that there was no credit for us hard working artists!

I have often admired published graphics in Atari User only to be left wondering who they were. - M. Warden, Bloxwich, Walsall.

Ah yes... sorry about that Mo. We did mean to credit you - honest.

To set the record straight the Degas and NeoChrome pictures used in the May issue were by Kev Bulmer himself - bottom four pictures on pages 10 and 11, Mo Warden - third picture on page 11 and both pictures on page 13, J. Powell - Thomper, Page 12, and Tom Hudson - M-TV robots, Page 12.

In the June issue the pictures on pages 12 and 13 were by Tom Hudson, with the exception of the Computer Aided Documentation which was by Kev Bulmer. The ST cover showed some of the stages involved in creating Kev's Andorid masterpiece.

If anyone has come up with
other graphic wonders on their ST or 8-bit, drop us a disc of
them, and we may publish a
few in a future issue.

**Graphics modes**

I HAVE just got an 800XL and
find some of the Basic easy to
understand, but I do not
understand the graphics at all.
On our school computers,
you have to do is use the
word GRAPH, but on the Atari
you use GRAPHICS followed
by a number.

I do not understand this.
Every time I attempt graphics,
I get an error message. I feel
this is a vital part of
programming, so you
please help me. – Martin
Harris, Hertfordshire.

The reason that the Atari
requires a number after GRA-
PHICS is to tell it which
graphics mode to use – there
are 15 basic modes, plus some
others.

Atari graphics are much
more powerful than those on
most computers, and there’s
not enough space in an entire
issue to cover them in full.

We did run a complete
series on using graphics in our
first eight issues – May to
December 1985 – which
should answer all of your
immediate questions.

**Looking for Yohan**

I AM writing to you about
Bounty Bob. After getting
through Bob’s causticisms, his
playroom Yukon’s Revenge,
even Acid Rain, where is
Yukon Yohan?

After completing the final
level there was still no sign
of him. We changed him from
a smoker to a gum chuffer and
did it again, still no sign.

The game in every respect
is brilliant probably the best I
have ever played on my 800XL
or anywhere else.

Finally if you know of an
Atari user group in the
Birmingham area, we would
be grateful. – Robert and
Karen Eventine, Bir-
mingham.

- Sorry, cannot help you with
  Yukon Yohan. Perhaps a
reader can oblige.

The Birmingham Atari User
Group meets on the first, third
and fourth Thursday of each
month at the Royal George
opposite St Martin’s Church,
Bull Ring, Birmingham.

**Bugs detected**

HERE are some bugs I have
found in a couple of games. In
Tapper, when you have lost
your last life press the fire
button three or four times to
continue at the same level
and score. After you lose this
life you will receive eight more.

Castle Wolfenstein, when
you have lost a life – not been
blown up – press the one key
twice as the game screen
turns blue and the drive is
running. Try this and see what
happens – the result is very
useful. – Brian DaBinett,
Brackley.

**Where did the colour go?**

I HAVE just got an Atari
130XE with a 1010 program
recorder.

I was very pleased with the
computer, until I tried it on a
colour TV. I loaded a cassette
game into the computer, but
could not get any colour on the
screen.

I wondered whether it was
just the game at first, so I tried
the Basic colour command but
still got none.

Should I get my computer
repaired, or is this a problem
I could solve myself? – Jason
Dyke, Gravesend, Kent.

- If you can’t solve the fault
  by returning your TV set and
  adjusting the colour controls
  your best bet would be to take
  the computer back to your
dealer and get it replaced.

There is nothing you can easily
do yourself.

**Spelling mistake**

WHENEVER I type a setcollision
command, such as SETCOLOUR
2.0.0 I get this:
ERROR: SETCOLOUR R.0.0
Please can you sort out this
problem.

Also whenever I load some
games with Start and Option,
sometimes get a BOOT
ERROR, BOOT ERROR
message and then the computer
puts itself into SELF-TEST
mode. What’s happening? –
Mark Kaye, Sherwood,
Nottingham.

- You haven’t looked
carefully at your manuals,
have you? The command is
spelt SETCOLOR, not SETCOLOUR. If you type it
correctly it will work OK.

As to your BOOT ERROR
problems it sounds as though
you might need to clean the
heads on the tape recorder.

All Boot Error means is that
the tape has failed to load. If it
happens on too many of your
tapes consider taking the
recorder back to be checked.

**Speedy listings**

I HOPE this will help Peregrine
Hill, Mailbag May 1986,
regarding the speed listings
scroll.

Listings do scroll too fast to
read, but there is a way of
pausing the listing without
recurring to repeated use of
Break. LIST (line no.), (line
no.).

This is done by holding
down the Control key, then
pressing the 1-Key. This will
pause the listing. Pressing
Control-1 again will continue
the scroll.

Using Control-1 will freeze
the computer, and it will not
accept any entry from the
keyboard, except Control-1 or
Break. So if you use this
remember to press Control-1
to continue the scroll or Break
to edit your program.

This feature can also be
used to pause Basic programs
while they are running, but
remember to hit Control-1
again to enable the program to
continue. – Peter Boulter,
Twickenham, Middlesex.

**Sluggish interpreter**

AS a confirmed Basic user, I
am rather disappointed with
the language provided with my
recently bought 800XL.

While its features are
entirely adequate, its speed is
prohibitive for large data
handling programs which I
write.

I have used a BBC com-
puter which offers equal, if not
more, facilities and yet seems
much faster.

This may be a naive
comment, but since both these
machines use the same
processor surely a faster Basic
for the Atari could be written.

I have been following the
recent articles in Atari User on the Basic Compiler with some interest and, while this offers probably the best solution to the speed problem, I feel that there is still room for a fast translator-type Basic.

Your comments on this subject would be appreciated.

Mike Rose, Didcot, Oxon.

There are indeed faster Basic interpreters for the Atari, the best of which is probably O.S.S.'s Basic-XE.

It is entirely compatible with your standard Atari Basic programs, but runs between two and four times faster, has full procedure operations with parameters passing, player/missile graphics, I/O control, DOS functions and IF...THEN...ELSE...ENDIF, WHILE...ENDW, string arrays - plus LEFT$, MID$, FIND and so on.

It also features fast array sort functions and much faster floating point operations. All of this is packed into a bank-switching cartridge which takes up no more memory than standard Basic does.

To cap it all, if you happen to have a 130XE with 128k, you can use that extra 64k banking for programs automatically, which means more free memory than any other Basic.

O.S.S. products are imported from US by Software Express, and are thus a little expensive, but once you've used them you'll never turn back.

Getting it wrong

I OWN a 130XE, disc drive 1050 and XCII cassette deck.

I have bought your magazine since January 1986, and am having some difficulty typing in the listings.

Could you print the listing of the Get It Right! program again, so I can see where I've been going wrong with Des Belts and Dots Square. - J.A. Buys, Holland.

I HAVE just read David Chapman's letter in your May

issue. I also am a newcomer to home computing, and would like to know how to use the checklist.

As you did not reply to this question from him, would you reply to mine?

By the way, a really good book explaining programming is Easy Programming for the Atari Micros by Eric Deeson.

It is written in easily understood language, which even I could get to grips with. - Diane Bonnington, Stratford, London.

I TRIED your checksum in the March 1986 issue of Atari User on a program called Bounce from the February 1986 issue.

When I typed the program in and typed LIST "C" and pressed return, then the computer started saving.

When it finished it said "Delete program by typing NEW", which I did. It then said "Now load it right into the machine taking note of instructions contained in REM 999" so all I did was type LOAD, and after a few seconds I got Error 21 load file error.

Please, tell me what I'm doing wrong, and what is REM 999. - Christopher McNerney, Dunstable, Beds.

I HAVE recently got an Atari 800XL computer and since then have been buying your useful and informative magazine. However I have noticed that your listings have a section labelled Get It Right!

I get the feeling that this will be useful when inputting your programs, but I do not know how to use it.

Could you please explain to me how to use this facility as I invariably make mistakes in my typing. - Dave Smallman, Peterborough.

To use the Get It Right! program firstly make sure that you have the updated version of the program, as provided on the January 1986 disc/cassette.

After typing it in, save it as CSAVE it to a spare cassette, or just save it to disc, and write-protect it.

Line 999 will need to be altered depending on whether you have a disc or cassette.

Each time you want to checksum a new program type it in from the magazine, and then list it to tape or disc - for example LIST "C.5", or LIST "D:TEST".

Now type NEW and load the Get It Right! tape back into memory, with CLOAD.

Put your listed program back into your recorder/disc drive, and type RUN.

The checksum information will now magically appear on the screen. Check this off against the version printed in the magazine. If you have made any mistakes the numbers will not tally on the incorrect lines.

If you want to reload the listed program again, type NEW and then use ENTER "C." or ENTER "D:TEST".

In response to numerous requests we shall be reprinting the Get It Right! program in next month's Atari User.

Overlapped listings

I HAVE an Atari 800XL, and am having difficulty typing in certain lines of your published programs.

When I type them in the 800XL rejects them. I have also tried on two other 800XLs with the same result.

Some examples are October 1985 Poonlo toolbar 300 and 1110, January 1986 Des Belts line 4010, and March 1986 Horseplay line 1010 and 2670.

Is this because the games have been typed on a different model?

I have tried altering the lines and splitting them up, but with my very limited knowledge of Basic I am having little success. Any light thrown on this subject would be very welcome. - William Jackson, Buckhaven, Leven Fyfe.

I OWN a 800XL and have been trying to type in Mr. Humby, but the last bit of line 4010 won't go in - 8-BRIDGE.IS? 5."

Can you tell me if there is any way to get the line in? - Bryan Vince, Luton Beds.

Your program lies in the fact that the Atari can only accept up to three screen lines of typing at once - that's what the bell near the end of the third line means.

Some of our listings, as you have found out, overlap on to FOUR lines. So how do you type them in?

Firstly, before starting to type a program in, try typing POKE 82.0. This allows you to use the space in the left margin to type in, giving you an extra six characters.

The other way to pack more on to a line is to use

Correction corrected

FOR those of you with XL or XE machines who have been trying to use Frank O'Dwyers Basic Compiler program, we're sorry to say there was a small mistake in last month's correction piece on page 32 (How embarrassing...).

All you need to do to get it fully working (honest), is to ENTER the Library section into your Assembler/Editor, and add the following two lines:

509 JNP CONTROG : BYPASS XL/I XE BUCHAN & GET MOD.
530 CONTROG

Then LIST it back on to your master tape or disc. Otherwise your compiled program will more than likely just print a heart on the screen and promptly crash. When you've written some programs using the compiler why not send some examples in to us? We'll print some of the best in a future issue.

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abbreviations. For example, typing POS. 12 means the same to the computer as
POSITION 12.

The abbreviations are listed in the manual, but POS. for POSITION, SE. for SETCOLOR
and DR. for DRAWTO are some common ones.

Also don't type in spaces outside of double-quotes
when you're short of space:

"HELLO" : SEDO 1000

is just as good as:

10 ? "HELLO" : SEDO 1000

to the computer.

Using a combination
of these tricks you can type in
anything that appears in these
pages - don't forget, someone
had to type it all in in the first
place.

Graphic

characters

I AM having difficulty pro-
gramming Fruit Gambler from your August 1985 issue.

In this month's issue a correspon-
dent has explained how to get the arrow symbol,
but I cannot key most of the
graphic characters printed in
this program.

Could you tell me how to
type these characters in? The
lines that are causing me
difficulty are 1150, 1160, 1170, 1710, 1720, 1740,
1750, 1760 and 1770. - V.
Dryden, East Sussex.

The characters you refer to
are all created by pressing
tabs while holding down the
Control button.

These are listed in full in our
December 1985 issue, along
with all of the arrows and so on
that you mention.

Listing often contain these
characters side-by-side to
make block shapes and under-
lines.

Contacts

wanted

AT the end of last year I
decided to sell my BBC Micro

after four years of total
boredom.

With part of the money I
bought an Atari 80XL and
1050 Disc Drive. Now I look
on computers as a joyful
hobby once more.

I am interested in contact-
ating Atari users in the Colches-
ter district so I can exchange
views, software and so on.

Mark Goaling, 9 Norfolk
Avenue, Mersea Island,
Essex CO5 8EN.

** **

I LIVE in Shapton Mallet,
Somerset, and own an 80XL.
Could you put me in touch
with any other Atari users
nearby? - David Stevens,
Fox Hollow, 8 Gold Hill,
Shapton Mallet, Somerset,
England.

** **

PENPALS are required in the
Merseyside area to swap hints
and tips on programming and

** **

games. I own an 800 and
130XE, and am shortly buying
an ST.

Please write to Mike
Lynch, 24 Oakdene Road,
Anfield, Liverpool,
Merseyside L4 2SR.

** **

I WOULD be interested in
getting in touch with anyone
who is interested in serious
programming on the 800XL. I
would like to swap ideas on
assemblers, monitors and so on.

Nino Matassa, 66/67
Talbot Street, Dublin 1,
Ireland.

** **

I OWN an Atari 800XL and
here in Malaysia, Atari computers
are not as popular as in the
USA and the UK.

Most of the people here just
think of it as a games machine,
so I have many problems in
getting the software and
hardware.

The nearest place where I
can get Atari User is 100 miles
away. I can't get every issue
of the magazine, and the ones I
can get are two months late.

I would like some pen pals
who own Atari 8 bit computers
in any country outside Malay-
sia. Interested please contact:

Ooi Chee Kian, 192 Taman
Lam Sun, 05200 Alor Setar,
Kedah, Malaysia.

** **

I OWN an Atari 800XL and
XC11 data recorder, and
would like to correspond with
Atari users of any nationality.
Interested in assembler,
machine code and so on.

Luis Alberto, Rua Miguel Pais
No. 27 30B, 2830 Barreiro,
Portugal.

If you find yourself out in
the countryside when it comes
to finding other Atari enthusiasts
you could always join
MicroLink.

There are thousands of
users of computers, including
Ataris, from all over the world.

A good advert for Atari

I RANK the Atari help-line to
ask for details of a local 520ST
supplier.

They gave me the details of
an area wholesaler who gave
me the name of a company in
Worcester from whom I
bought the 520ST, a 1Mb disc
and an Epson LX-80
printer.

I received no demo, nor
assistance with setting up, but
received only the systems disc
- no other free issue software.

The disc drive never did
work and was replaced, and by
going direct to the wholesaler
I was able to get the other free
issue software.

From time to time I asked
for the new free issue software
which I read about in your
magazine, but no avail. My
dealer just told me that the
new was not as good as the
old, and that was that.

In February I read an
advertisement by Software
Express in your magazine and
bought some business
software from them.

They showed great know-
edge and skill and were

obvious enthusiasts. I used the
software, but experienced odd
trouble with it, concluding
that it was my lack of
computer literacy.

The whole system then
gave up quite recently, and it
was thought to be the disc
drive again. This was returned
to the dealer who told me it
had a 90 day warranty, but
that they would send it for
repair.

As I have a business to run
and could not afford to wait
the 7 to 10 days needed for
repair I decided to buy another
disc drive, so that eventually
I would have twin disc drives.
At the same time I wanted to
have ROM chips fitted to my
board.

Naturally I returned to
Software Express who found
to their surprise that the board
was one of the fist ever made,
and in theory at least I should
cannot have been sold in December
1985. In consequence they
could not fit the chips.

Although they were not the
original dealer they arranged
for a wholesale to replace the
board with a new one, to
which they fitted the ROM
chips. In the short time since I
bought the Atari I have learnt
the following lessons - firstly
Atari do not deal with corres-
pondence. Also if you are a
business user and require
support go to a dealer like
Software Express. My first
choice turned out to be a
computer game retailer.

The quality control on Atari
products is obviously not all it
should be, so check the
warranty terms carefully. In
my case I later learned that the
warranty on the disc drive is
12 months not 90 days.

Finally read Atari User
carefully, and get the updated
software and other equipment
upgrades to which you are
entitled.

I cannot praise Software
Express enough for their
service and efficiency - they
are a better advertisement for
Atari products than Atari
resolve. - M.C. Faiers,
Lower Broadheath, Wor-
caster.
on the service, and you can send electronic mail or chat to them directly via your keyboard and screen.

Don't forget that you can do all of this with a local phone call, even if the other user is the other side of the world. It bests having to rely on SnailMail anyway.

Joystick ports

PLEASE could you tell me how to use both joystick ports within a Basic program?

I suspect it will need a machine code routine accessed by the Basic program, or can I peek into specific memory locations to get the same results? — L. Groves, Swindon, Wiltshire.

Although you can use peeks and machine code, why not use the STICK command to read the joystick?

All you need to do is use LET A=STICK(0) or LET A=STICK(1), depending on which joystick you are interested in.

The variable A, or whichever one you used, will then contain one value from the following:

```
|   |   |   |   |
```

The trigger button can be checked by using STRIG(0) or STRIG(1). If the answer is 0 then the button is pressed.

Printer software

I HAVE recently bought a 1027 printer to use with an 800XLT with cassette recorder.

However I have been unable to obtain software — cartridge or cassette — to put the printer to good use — the only word processor type software being on disc.

Could you tell me of anything available? — B. Middle, Penygraig, Tonypandy.

The best answer to your problem is, as you say, a disc-based word processor such as SuperScript or PaperClip.

However Atari's own AtariWriter cartridge is quite a nice little word processor for the money, and it will work with cassette.

Your only problem may be that of finding a copy, as they are a little scarce these days.

Print quality

A DISABLED friend of mine was given an Atari 800XL plus data recorder and a bundle of games for Christmas. She is now very keen to make up a word processor.

What she wants to do is to type words in upper and lower case that appear on the screen so that she can modify and then print them on an A4 sheet in good typescript — so maybe a full word processor is not needed.

With frantically scraped-together money I bought an Atari 1027 printer, knowing that other stuff would probably be needed.

She was pleased, knowing my technical aptitude, that I had not returned bearing a 1928 Remington typewriter and a P9 battery, but when I tried out the printer we were both disappointed for two reasons.

The typescript wasn't black enough — despite changing that little roller and even rolling the spare one across the letter die. It's irritatingly mild looking.

Also there are two lines on the TV screen — (approx) one line on the A4 sheet. This will surely dash to pieces the dream of viewing a complete A4 sheet on the screen and then selectively altering same.

Bit of a depressing situation. Perhaps I should have bought an electric typewriter with computer compatibility.

I know that I've got to buy a program but do I have to discard the data recorder and get a disc drive? — J. Chapman, Birmingham.

There is little that can be done to improve the print quality. Don't forget that, although it set you back quite a sum of money, the 1027 is still a budget type of printer when compared to most letter quality machines.

The screen problem can't be overcome completely, other than with a hardware modification, but you could use a word processor such as SuperScript, AtariWriter Plus or PaperClip, all of which give you preview mode which allows you to use the 40 column screen as a window on to a larger format.

This allows you to check that the columns are aligned correctly and so on before you commit the text to paper.

As to your question on cassettes — we would strongly recommend that you invest in a disc drive — all of the above programs being disc only — both for greater reliability and much greater speed.

Reversing the screen

I TYPED into my 800XL the Painter program and from February's issue of Atari User. It is very useful but I have a few queries.

The program also works for Koala Pad which uses 62 sector graphic files. However some files appear reversed when dumped to a printer in other words as negatives.

Is there any quick way to reverse the screen before the disc dump? I can do it only by changing or reversing each line on the screen. It takes ages but it won't work.

Secondly, when a screen is saved it requires 64 sectors instead of 62. This doesn't seem to make any difference when loaded back on the screen, but when the saved screen is dumped to a printer the last pass of the printer leaves two lines of garbage at the end. — R.G. Routledge, Westcliff-on-Sea, Essex.

The real answer to your problem is to use a machine code program, but the fastest that poor old Basic will do is by using the following program:

```
18 ADDR=PEEK(86)+PEEK(89)\r\n20 FOR I=ADDR TO ADDR+679\n26 POKE I,PEEK(I)\r\n48 NEXT I
```

This should be run with the graphics screen displayed but before going to the dump routine. It will invert the whole of the screen — faster than LOCATE and PLOT, but still not very fast I'm afraid.

Surviving Mercenary

I WOULD like to compliment Novagen on its new game Mercenary. I have just spent two days playing it, and have finished it, the easy way.

For anyone who is stuck in Mercenary I suggest you take the easy way out and send away for the survival kit and hint sheet.

This is a good way to get you to spend more money, but for around £3 it's well worth getting.

It is also a good idea to save your position at frequent intervals to save time if you lose the program. One last hint — don't go into the prison! — W. Wedderburn, By Avenmore, Scotland.

Advertising begins at home

I HAVE just read your comments on Micro Live in Atari User and I would like to say I and my friends whole heartedly agree with what you say.

Micro Live has always been an advert for Acorn micros.
Ever since the first programme the BBC Micro has been used as a home computer vastly superior to anything else. In an early programme there was a comparison between word processors for home micros. This was done with five or six different micros lined up each using its own program.

Atariwriter was featured on an "SOVL" operated by some TV personality. Needless to say, Atariwriter was found to be difficult to use because it only had a 40 column display and actually looked down upon. The Beeb, of course, was the machine for word processing, with Wordwave. When Micro Live's American correspondent announced the launch of, and impact of, the 520ST it was played down at this end, and the report seemed to be cut short. But fair though, its not only Micro Live. Tomorrow's World and Blue Peter are also involved in this massive hype.

Without this advertising support the BBC Micro may well have died from an excess of overcharging a long while ago — David Butters, Swaffham.

**Bugs, bugs and even more bugs**

SEVERAL years ago when the BBC Micro was first announced there were many tales of bug in ROMs dodgy PSUs and flaky ULAs. It seems that even now a machine is plagued with problems from the point of purchase.

I bought an Atari 520ST in October 1986 and have since had no end of trouble in trying to obtain the specification as advertised. The operating system in ram is still not available as an upgrade in rom, so you effectively lose 200k of memory from the point of purchase.

With Basic loaded you are left with roughly 5k of program space. I am now told by Atari that if I wish to connect a colour monitor to my machine after the rom upgrade which costs £25 I will be required to buy a new video chip for £40.

It also seems that to get a decent version of Basic, in other words without bugs, Atari users are going to have to fork out £90 for the new Atari Basic.

This is just typical of the computer industry. When will manufacturers finish their products before releasing them? — David Hale, Ashford, Middlesex.

**Less costly control box**

I HAVE had an Atari 130XE for about a year and would like to know if it is possible to control several motors.

All I want is the control box. I have seen the zero 2 robot for £119.95 but this is too expensive for me, so can you tell me where I can get a less costly control box. I have tried Sifcaa Shop, but they don't do robotics for the Atari. — Philip Mack, London SE8 4DY.

* In the new Great Little Gadgets series we will be covering motor control and so on.
RUMOUR has it that a certain competitor of the Atari can display listings with black ruled lines under every line of text. This probably doesn’t make much difference in normal usage, though it’s an interesting effect.

However when you are editing crowded programs, or displaying text for very young readers the lines can improve screen legibility, so here’s a routine that will put the competition to shame.

It works by changing the display list, naturally enough, but it has to cheat a bit because there’s a potential conflict between the Antic chip and the screen editor.

The editor assumes there are always 24 text lines in a Graphics 0 screen, and it won’t notice the thin black ones. But Antic controls the TV display and it wants to add extra lines, which means your TV display will get taller.

Twenty three black lines are needed, and each is one-eighth of a Graphics 0 line high. So we need to accommodate the equivalent of three extra text lines on screen.

Fortunately Atari left very generous top and bottom margins when they designed the hardware, so most TVs can cope provided they are adjusted correctly.

The new display list sits in page 6 where else? and the data statements show what it looks like.

Every O produces a blank line, and every 2 a normal text line.

The first three numbers added together determine the top margin, and you will probably need to experiment with other values to suit your own TV.

Legal numbers are 0, 16, 32, 48, 64, 80, 96 and 112. Don’t forget that this is bending the rules, as all display lists should, according to Atari, start with three 112s.

A display list is not a true machine code routine, although it looks a bit like one. It’s more of a data table, which Antic refers to as it draws the TV display.

You can therefore change some of the numbers without locking everything up – though you will get some peculiar results if you alter any but the first three.

Lines 10 to 30 copy the new display list into page 6, starting at address 1536. Line 40 tells this display list where the screen is located in memory, and line 50 gives Antic the new address to tell it to start using the new display instead of the standard one.

Once this has happened the Basic loader routine is no longer needed. Type NEW and the new display will still remain.

Pressing System Reset will bring back the conventional screen, but the ruled lines can be restored by repeating the POKE instructions at line 40.
These back issues are still available

**June issue:** Analysis of the 130XE, Submarine, Adventuring, Random numbers, Software reviews, Frog Jump, Microscope, Sounds, Atari Insights – Bit Wise, Beginners and Graphics, special 12 page feature on Communications.

**July issue:** Disasterplotter, Bomb Run, DOS 2.5, 17 Commandments, Adventuring, Display List Tutorial, Software reviews, Power Functions, Treasure Hunt, Keyboard Sounds, Microscope, Insights – Bit Wise, Beginners and Graphics.

**August issue:** Analysis of 520ST, program protection routines, Fruiti Gambler, Assembler, Touch Tablet programs, first look at Logo, Raider 1997, Dos 2.5 upgrade offer, Display List Tutorial, Microscope,Software reviews, Insights – Bit Wise, Beginners and Graphics.

**September issue:** 8 page special on the 520ST, Mode 8 screen dump routine, Maze Munch, Data Maker, Display List Tutorial, 68000 addressing modes, list processing with Logo, Software reviews, Insights – Bit Wise, Beginners and Graphics.

**October issue:** Computer Canvas graphics program, Updates for RAW 6502 assembler, 130XE Ram-disc utility, Hex/ASCII memory dump utility, Pentoor, Software reviews, 68000 operating environment, Wrapup, Insights – Bit Wise, Beginners and Graphics.

**November issue:** Converse program, Bitwise operator utility, ST graphics examples, ST software list, Guy Pinders game, Display List tutorial, Adventuring, Microscope, Software reviews, Insights – Bit Wise, Beginners and Graphics.

**March issue:** Machine code games Pt. 3, Knight's tour program, Compiler Pt. 1, Superscript review, Checkers for early games, Book reviews, Adventuring, Software reviews, PLUS Atari ST User: K Spread review, Jeff Miner and Colour-space, Music Pt. 1, Making the most of the ST.

**April issue:** Sound synthesizer, Compiler Pt. 2, Using modes 12 and 13, Manicana strategy game, disc directory printing utility, Adventuring, Software reviews, PLUS Atari ST User: Review of TID's Module 2, music via the Midi ports, Making the most of the ST, and all the latest news.

**May issue:** Sam Tramiel Interview, Coveen Escape maze game, Compiler Pt. 3, Player Missile Graphics Pt. 1, Anna's Spelling Program, Adventuring, Software reviews, PLUS Atari ST User: Atari Show report, The Prawn and Disk Utilities, reviewed, ST Graphics Pt. 1, Degas-to-NeoChrome Picture conversion program, Making the most of your ST, and the latest 8-bit and ST news from the States.

**June issue:** Coveen Escape maze editor. Part 1 of Great Little Gadgets – build a light sensor. Final part of Basic Compiler series, Five Liners £1, Player Missile Graphics Pt. 2, Adventuring, Software reviews, American Scene, PLUS Atari ST User: Conclusion of ST Art series, type-in 3D maze game in Basic, Two 1 meg upgraders, Software reviews, Making the most of the ST, and all the latest ST news.
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JULY: Bomb Run: Flatten the deserted city and land safely. Disassembler: Find out what's going on deep inside your Atari. Treasure Hunt: Use logical thinking to find the treasure. Password Generator: Keep generating passwords till you find one you like. Keyboard Convert your micro into an organ! Quasimodo: Can you sort out the mess of ropes in the bellry?


MARCH: Horse Play: Knight's tour program. Basic Compiler: Program to accompany the new series Alien Attack: Final part of assembly listing. Plus: Freebie of the month. Winston in the Caves - can you keep your head and help Winston find his?

APRIL: Synthesiser: Activate the hidden depths of the Atari sound chip. Disc Index: Keep track of disc files and free space with this index printing program. Graphics: Make the most of Modes 12 and 13. Mancuna: Can you beat the game that learns from its mistakes?

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JUNE: Maze Creator: Create hundreds of new mazes for last month's Cavern Escape game. Player Missile Editor: Create your own DATA shapes with this Player/Missile Editor. Five Liner 1: Simple Dice rolling routine - build it into your own programs.

JULY: Space Maze: Maneouvre your spacecraft through the treacherous space caverns. Player Missile Example: Program to display your Player Missile graphics. Gadgets: Two programs to run devices via your new joystick-port interface. Five Liner 2: Create your own ASCII game.

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