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News
We keep you completely up to date with this month’s happenings and new releases around the UK in the Atari 8 bit and ST world.

Software
There’s a lot of Bally Hoo down at Beer Belly Burt’s Brew Biz, as Nuclear Nick takes a Solo Flight down to Beach Head II… We review them all.

Graphics
Steven Williamson demonstrates how machine code can help to move your Player Missile Graphics up and down the screen.

Gadgets
In the third part of his series on Great Little Gadgets, Len Golding starts looking at the problems involved in controlling mains apparatus from your computer.

Adventuring
Brillig emerges once again from the dank depths of the computer dungeon to answer more of your adventure questions.
**Game**
Help Frank the Fruit Fiend to eat his fill in this eight level Basic and machine code arcade game by S. Bullough.

---

**Checksum**
Bowing to tremendous demand, we re-print our popular Get-It-Right! checksum program, with the bonus of a few added features.

---

**Mailbag**
You’ve sent in another varied batch of letters this month, with questions and comments on all aspects of Atari computers.

---

**5 Advice**
Andrew Bennett answers more of your questions, and clears up some of the confusion surrounding Atari’s numbering system.

---

**5 ST Roundup**
Mike Cowley takes another look at the latest developments on the ST scene – including the promise of a Unix-based system later this year.

---

**10 Graphics**
Peter Fellows has been looking into one way of using the ST’s astounding graphics to help small businesses.

---

**14 Reviews**
We look at Essex, a text adventure, and Major Motion, a fast action arcade game, in this month’s software reviews for the ST.

---

**19 Hardware**
Gordon Taylor takes a look at the new A S & T one meg disc drive and system stand.

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**20 Accounts**
Peter Connors evaluates Cashlink Accounts, a new and powerful accounts package for the ST.

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**25 Database**
H & D Base is a remarkable new software package for the ST which offers the same features as Dbase II. Simon Terry investigates.

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**27 American Scene**
Our US correspondent reports on last month’s Consumer Electronics Show in Chicago, and all the latest stateside releases.

---

**Five Liners**
The first Five-Line programs from our readers help to liven up your text display, turn your Atari into a typewriter, and keep track of your variables. Each one wins £25.

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ATARI 8 bit market is booming

The Atari 8 bit market is booming as never before, keeping computer shop cash registers jingling up and down the country at a time when business is normally slack.

Defying the traditional summer sales lull, turnover in both hardware and software sectors has been brisk during the past couple of months, an Atari User survey has revealed.

Dealers say there are two main reasons why Atari 8 bit machines and software are moving when other brands are not:

One is the spectacular sale of 100,000 800XL machines through Dixons over Christmas which boosted the Atari 8 bit user base to a massive 300,000 in the UK.

The other is that software houses are responding to this — and the ongoing success of the 130XE — by producing a steady supply of new programs at affordable prices.

Where the Atari 8 bit owner could expect to pay about £19.95 — and sometimes as much as £29.95 — per game a year ago, he can now get quality titles for £9.95, with some as cheap as £2.99.

Retailers report that lower prices have dramatically increased unit sales of Atari 8 bit software, making it possible for youngsters to buy games with their pocket money instead of having to save for up weeks.

Although some software publishers were initially unhappy at lower profit margins per title, most say this has been more than compensated for by vastly increased sales.

Marketing director of Atari main dealership Silica Shop Tony Deane summed up the current situation: "Owners of Atari 8 bit machines need have no fear for the future."

"The entire trade is very pleased with the volume of recent business, coming at a time when the market is normally slow. In fact we have had a couple of really good months."

"A key factor has been that the Atari 8 bit software scene has changed completely, with a vast number of low-priced titles becoming available in response to the massive user base."

"What we are seeing is something similar to the way the Spectrum market went, with publishers starting to produce software at sensible prices."

"This has created a brand new buyer market, particularly among children, which is to everyone's benefit. Kids are now able to buy a cheap game each week during their summer holidays where before this was beyond their means."

"The new software situation is exactly what the public and the dealers want — inexpensive titles and vastly increased unit sales."

"The huge success of the Dixons deal at Christmas has ensured continuing support from software houses for the Atari 8 bit machines."

"In fact this support is actually increasing momentum as more publishers climb on the bandwagon."

WHAT THE STARS SAY

A NEW program for the Atari 8 bit range, Paranormal from Riverdale, is a four part do-it-yourself horoscope.

Company director David Edwards said: "A lot of research has gone into this. It not only predicts your future but indicates your present and past."

After feeding in your time and date of birth a full prediction is produced. In ESP a check can be made on your psychic abilities and reincarnation — funwise — reveals if you have lived before and as what.

Numerology assesses your character and Bio-Rhythms records your mental, physical and emotional powers.

Price: £4.

Bundled STs snapped up

BUNDLED Atari ST machines are selling like hot cakes at a North London retail outlet. An average of 30 520STM and 1040STF packages a day are being snapped up by customers at Twillstar Computers in Southall. There are six packages to choose from, four including the 520ST and two the 1040ST. The 1040ST package aimed at small business users is slightly outselling the 520ST one, bought mainly by home users, reports Twillstar managing director Amrit Dhesi.

Prices range from £675 for a 520ST bundled with 500 disk drive and mono monitor to £850 for a 1040ST with built-in 1mb drive and colour screen.

"We find the bundling of ST machines has been a tremendous success", Mrs Dhesi told Atari User."

"Customers usually know what they want the machine to do and how much they want to spend but they are often confused about which add-ons to buy."

Latest releases

APL8000 for the Atari ST has been released by MicronALP.

Widely used on minis and mainframe systems, APL is now entering the micro market in a diverse set of applications, including financial modelling, statistics, market research and insurance.

APL functions can exchange data with other Atari applications. As well as the standard APL8000 product, which uses the special APL character set, MicronALP also has a version which uses short English keywords to replace the special symbols.

It costs £170.

FIVE new adventures — Nightmare Maze, Screwball, Darts, Diamond Mine, and Castle Assault — have been released by Robloc Software, Rick Hanson, Project Thesis, Island of Xan and Enthar Seven will only be available on disc.

Enthar Seven costs £17.95 with the other three at £14.95.

A BET to stay overnight in a haunted house forms the theme of Cloak of Death, a new adventure for the 600XL and 800XL from Argus Press Software.

Once in the house the doors slam shut and here comes the Batlegrom from Vragus! The cassette costs £2.99.

A TEST of your knowledge of Britain comes in a new flying adventure for users of the 600/800 XLS and 130XE.

Released by Ariolasoft, Map Britain has you as the pilot of a helicopter seeking locations like towns, cities, rivers and counties. Points are scored when the right place is found in a certain time.

Price: £5.95.
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PRESTEL MBX NUMBER 221447299
PROBATION officer Ray Price has a plan to fight crime using Atari computers.

There are 20 male residents, aged from 17 to 71, at his Home Office-approved hostel in Canton, Cardiff. They include men on licence, probation and others on bail.

Ray, aged 55 and 15 years in the probation service, is keen advocate of computers to stimulate discussion on such subjects as alcoholism and aggression.

He said: "I am trying to obtain social work-type programs to use with the hostel's 800XL, and have received valuable help on translating existing software for the Atari from the Information and Technology Centres at Cardiff and Basildon, Essex.'

Some of the residents play games on the Atari, and Ray feels there is scope for introducing crime or addiction-related programs.

He said: "Once they understand the computer it will be possible to relate it to the problems associated with crime'.

One program questions the user on the amount of alcohol drunk and how often, and then indicates whether he is near to becoming or is an alcoholic.

Another features the attitude to the police. In one situation a friend is arrested and you are asked whether you should intervene, talk to the arresting officer or obtain help through a solicitor.

Ray said: "This type of program is invaluable as we can discuss the various situations, and evaluate the person's attitude and possibly his reasons for taking such actions'.

He is keen to set up an Atari users group in South Wales, based at the Information and Technology Centre at Cardiff, which he believes will help.

"I would hope not only to attract Atari users to meetings but also interest the residents in coming along', he said.

ATARI UK is seeking to forge personal links with all the ST user groups currently springing up throughout the country.

The company is to set up a directory of such organisations at its Slough headquarters in order to maintain regular contact.

In particular ATARI hopes to see a greater number of user groups with ongoing projects involving the company.

"We want to keep in touch with ST users as we would value their opinions at all times and their help on occasions', says Max Bambridge, the ATARI UK boss.

Secretaries or chairmen of groups are asked to write to Philippa Kearney, ATARI House, Railway Terrace, Slough, Berkshire SL2 5BZ. They should enclose the name of the club, its address, membership and telephone numbers of key officials, the number of members, and the times, dates and locations of meetings.

---

BIRTHDAY COMPETITION WINNERS

OUR first birthday competition was a tremendous success, with thousands of entries pouring into the office for weeks. Our grateful thanks to the manufacturers, software houses and distributors who generously donated the prizes. If your name is listed below, you can expect to hear from the respective company in the next few weeks.

The winners are:

Atari 130XE System: S.E. Partridge, Tamworth.
Atari 1050 disc drive: Andrew Nicholson, Colchester.
Steve Davis Snooker from CDS: A. Hughes, Stretford.


August 1986 ATARI USER 11
**Now the Atari comms scene springs to life**

A NEW wave of comms products is about to be launched for the ST market in the UK as the boom in sales of the machines continues unabated.

The latest breakthrough has been made by Peter Connors, a regular contributor to **Atari User**, with a program called Flying STart which he is selling for £10.

“I bought an ST to take the place of my ageing BBC Micro, but I still wanted to be able to access services like Prestel”, said Connors. “I didn’t set out to write a commercial package, just something that I could use myself”.

But now there is a good chance Flying STart could be taken up by one of the major comms software publishers, and it has already been enthusiastically reviewed by Micronet.

The package will work with any V21/V23 modem and has full colour or monochrome text and graphics. It can handle scrolling bulletin boards and is fully menu driven.

Connors is currently working on enhancements that will lead to a V-1.03 version to follow the existing V-1.01 product at a “somewhat higher price”. Meanwhile modem manufacturer Miracle Technology is putting the final touches to a powerful integrated ST comms software package called SuperTerm which it intends to launch on the Atari stand at the PCW Show in September.

It will have standard ASCII and Viewdata/Prestel modes of operation based on the GEM environment with VT100 emulation. Users can select from low or high resolution displays. SuperTerm will have capability for telesoftware downloading, file transfer, print frames to printer, and carry an in-built telephone directory.

Baud rate will be selectable between 300 full duplex up to 2400 full duplex and the complete package is expected to cost just under £50.

Bundled with Miracle’s new Hayes-compatible WS4000 modem, it will be offered as a complete comms system for the ST at under £200.

---

**Birthday offer**

TO celebrate its first birthday, Compumart, the Atari mail order company, is offering an Atari ST pack for £445—a saving of £140.

The pack consists of the 520STM with 500k drive and 20 3.5in discs.

Company managing director Steven Burke said: “We have just completed a move to a new warehouse in Loughborough and as it is also our birthday we decided to make special offers to celebrate”.

For readers of **Atari User** the company is offering two free discs with every box of 10 bought.

---

**TEENAGERS SUE OVER ATARI GAME**

A MILLION dollar suit has been filed against the Atari Games Corporation by two teenagers from Redwood City, California.

The boys are claiming that the bestselling arcade game Paperboy released by the Warner Communications-controlled company had been written by them.

Mark Caesar, 14, and Robin Hallingstad, 16, say they sent an outline of the game to Atari back in 1983.

So they were somewhat surprised two years later when they came across the game in a local arcade. It involves a paper boy whose attempts at delivery are hampered by vicious dogs, fast moving cars and a series of other obstacles.

Since its release, it is reported to have been a big hit in coin arcades across the States.

The boys now have a top Californian attorney representing them in their case against the company.

Atari officials are refusing to comment on the story, insisting that they have yet to receive a copy of the action against them.

---

**Trivial Pursuit for Atari**

TRIVIAL Pursuit, currently the world’s most successful board game, is to be released by Domark for Atari users early next year.

With 70 million copies having been sold worldwide—three million in the UK—there was fierce competition among software companies to obtain the rights to produce a home computer version of the game. Domark’s joint managing director, Mark Strachan, said: “We’re delighted that the Trivia people chose us”.

The game will be similar to the board version with the computer displaying the board and running the game.

A minimum of 3,000 questions will be included with the program; some with text only, but nearly half with sound and graphics.

To make replacement questions easier to market Domark is using a new system, UniLoad, which will mean that other versions can use the same data tape.

Strachan said: “We have already had 40,000 advance orders”. It is expected to sell for about £14.95.
ATARI Users...

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68 Chester Road, Hazel Grove, Stockport SK7 5NY

August 1986 ATARI USER 13
Platform yawns

Program: Beer Belly Burt's Brew Biz
Price: £2.99 (cassette), £4.99 (disc)
Supplier: Americana Software, ofo US Gold, Unit 2 and 3, Holford Way, Holford, Birmingham B6 7AX, Tel. 021-355-3388

Sorry to have to report that, despite the intriguing title, this game is nothing more than another one off the seemingly interminable production line of platform games. In fact, the only unusual thing about it is the title. Score zero for originality.

The game is described on the packaging thus: '32 fast action screens of action-packed exciting fun as Burt wanders through the Brewing Factory'.

There may well be 32 screens but after a few plays I was so bored that I had no desire to put that statement to the test. The screens I did manage to stay awake through were certainly neither fast-action, exciting or action-packed. Snail-action, monotonous and yawningly would be more apt.

The Burt of the alliterative title is a bally pink figure who can run left and right (taking a bit of time to get up steam), and can jump, sit down and fire bullets.

The game begins outside the factory where there are separate entrances for shipping, production and control, each of which leads to a different part of the factory.

Basically, each screen is a series of stages dotted with doors through which the meanies, without which no platform game is complete, appear.

Each shooting meanie looks exactly the same as the last shooting meanie. Kill one and another eventually appears from the same door.

As well as meanies, platforms and doors, there are moving trucks, escalators, rolling barrels and blowers, the latter gently floating Burt upwards to a higher platform. Moving off a certain edge of most screens usually takes you to another screen.

Don't ask me what the object of the game is - the minimal instructions were silent on that point. About the only thing they do tell you is that the game can be played by one or two players.

The gameplay was dull, the graphics mediocre, the use of colour unimaginative, the animation basic and the sound below average.

Granted it is inexpensive, but if you really want a cheap but enjoyable platform game, better by far are Ollies Follies and Nuclear Nick from the same company.

Bob Chappell

Sound ................. 4
Graphics ................ 5
Playability .............. 4
Value ................... 5
Overall .................. 4

Platform fun

Program: Nuclear Nick
Price: £2.99 (cassette), £4.99 (disc)
Supplier: Americana Software, ofo US Gold, Unit 2 and 3, Holford Way, Holford, Birmingham B6 7AX, Tel. 021-355-3388

SURPRISE, surprise, Nuclear Nick is yet another platform game. Nothing wrong with that provided the game challenges and entertains - and this one certainly does.

You control Nick, the usual running, jumping bimbo, whose job it is to whizz around various platforms grabbing the goodies and blasting the baddies.

The basic villains of the piece are patrolling roly-poly robots whose very touch spells lights out for our hero. Although Nick has no weapons, he can strike back by eating what appear to be - I hope you're ready for this - radioactive hamburgers!

I say appear because US Gold sent no instructions with my review copy. But given the title, the flaying of said burgers, the fact that Nick immediately starts to pulse and grow after feeding his face, and the dire consequences for the robots, it seems a fair deduction.

That being so, the game deserves to win the equivalent of the Jules Rimet trophy for daffy plots, not to mention the matter of questionable taste (no pun intended).

Gobbling down a jumboburger gives Nick several seconds worth of radioactive indigestion, enabling him to neutralise as many robots as he can reach before his digestive system returns to normal. Once victorious, Nick can progress to the next screen.

Further points can be amassed by gathering up small suspended bricks (nuclear waste, antacid tablets?) along the way. Nick has five lives and 20 screens to cross, each tougher than the last.

While the robots and burgers are always the same in appearance if not quantity, each screen has a different configuration of platforms.

The graphics are crisp and attractive and, though there is no music, sound effects are generous and, I think, appropriate (have you ever swallowed a radioactive burger?).

The game is simple to get into, while the difficulty of the screens range from taking candy from a baby to expulsive deletion.

Despite its dubious scenario and unsubtle content, Nuclear Nick is a pretty good platform game. And at the cheapo asking price, it's a genuine bargain.

Bob Chappell

Sound ................. 7
Graphics ................ 8
Playability .............. 9
Value ................... 9
Overall .................. 9
Question time

Product: PQ - The Party Quiz
Game
Price: £19.95
Supplier: Suncom, c/o Software Express, 514-516, Alum Rock Road, Alum Rock, Birmingham B8 3HX. Tel: 021-328 3885.

SINCE the advent of the Trivial Pursuit quiz game, dining rooms have been buzzing until the early hours of the morning with questions and answers on a variety of general knowledge topics.

As parents and children recreate long-forgotten family evenings, even the trusty TV faded into the background and the ever popular home micro began to feel somewhat neglected.

But fear not, help is at hand for you micro addicts who suffer withdrawal symptoms from even one night's absence from your box of bytes.

Suncom has released a computer version of this popular family general knowledge game in the form of Party Quiz. You can liken it to the video game seen currently in many public houses.

You are provided with four neat and well built quick response hand controllers so that the game can be played without using the keyboard.

All the controllers plug into one interface box which in turn connects to both joystick ports. There are four buttons on the controllers and they correspond to the numbered answers that appear on the screen.

There are two types of questions - a multiple choice, which displays four possible answers with only one correct, and a straightforward true/false variety requiring the use of only two of the four buttons.

Two discs contain all the questions, with the Atari version on side A. These questions are pure general knowledge with no specialist subjects, as in the table top game.

Once the game is loaded, pressing Option displays a menu screen. From here you can alter the game format by selecting the number of players, the response time for each quiz, the number of rounds, type of game and whether any of the four players is to be handicapped or not.

The response time can be set to 10 seconds, five seconds or a challenging three seconds and a visible countdown bar in the main game reduces in length at a speed relative to this response time as you attempt an answer.

You can have up to 20 rounds, with each round containing 10 questions.

There are also lightning bonus rounds where the computer randomly selects a player who is given 20 seconds to answer up to 10 questions. It then picks another player until all have had a crack at the bonus round.

The type of game can be altered between competitive and social. In the former only the first correct answer scores, whereas in the latter all players may attempt an answer, with all correct answers scoring.

Handicapping any player from the main menu screen immediately reduces his response time by half. His controller is automatically rendered inoperative when the response time has elapsed.

The computer automatically takes care of the scoring and at the end of the game all the players are rated according to their performance.

The game is obviously meant for the American market, as the questions generally orientate around American culture, history and general knowledge.

For example the question "The area code for Las Vegas?" would probably leave even the most experienced Mastermind addict clueless.

There are no graphics in this game, and the little use made of sound is restricted to highlighting the decreasing countdown bar, but this does add somewhat to the tension when you are deep in thought.

The idea of four separate controllers is great and makes for quick responses, but this game has been introduced too late, as Trivia fever has already begun to dwindle.

It's a worthy effort, but not for me. The general knowledge addicts among you may quite enjoy it, but it's rather expensive for what you get - and you are going to have to brush up an awful lot on America.

David Andrews

Party Quiz comes complete with two discs, a manual and four controllers.

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August 1986 ATARI USER 15
It's a great war...

Program: Beach-Head II
Price: £34.95
Supplier: Access Software, c/o Software Express, 514-516 Alma Rock Road, Alum Rock, Birmingham BB 3HX. Tel: 021-328 3565.

AS you'll have gathered from the title, this is the long awaited follow-up to the very successful Beach-Head. And for the money, this is better than the original.

Sub-titled The Dictator Strikes Back!, it is a two-player game with your opponent being either another player or the computer. Against the computer, it doesn't matter which side you play, for the computer will control the other.

Like its predecessor, Beach-Head II has four distinct sequences. The first, Attack, is probably the best. In it the Allies drop troops from a helicopter ready to begin the assault against the Dictator's stronghold.

The troops have to be parachuted evenly behind a four-section wall from which they must advance down the screen to a two-section wall.

From here they scramble towards the door of the enemy's lair and out of reach of the machine gun which all the time has been rat-a-tat-tatting away at them leaving a pockmarked battlefield.

Men can be sent over the wall as a diversion and grenades can be hurled at the gun, but the ultimate objective is to get at least one man to the door.

In Rescue, escaping hostages have to flee across an open courtyard. The Dictator has four methods of stopping them - dropping stones from a wall, placing mines from trapdoors hidden in the courtyard, and sending out tanks and rocket-launching trucks. The Allies try to fend off all these attacks with a captured machine gun.

Escape has the hostages up in a helicopter which is under attack from the Dictator. Graphically this is the weakest of the four scenarios, though still pretty exciting to play.

The final sequence Battle, has the Dictator (the Dragon) and the head of the Allies (J.P. Stryker) facing each other in a head-to-head across an underground river.

Perched on long platforms, the two hurl poonitas (sharpened wooden sticks, it says here) at each other for several rounds.

The throws can be straight or curved and small speech bubbles appear to let you know the rivals' innermost thoughts.

First one to get impaled with four poonitas is a sissy and falls off the platform and into the river.

There is an option to practice any screen and an automatic demo mode to show you how it should be done.

I missed the speech synthesis of the Commodore 64 version but even so, this is still a superb game.

The animated action and use of sound are a treat. The game offers bags of thrills and spills and is one of the best releases for the Atari this year. Not to be missed.

Bob Chappell

Good simulation

Program: Solo Flight II
Price: £9.95 (cassette), £14.95 (disc)
Supplier: US Gold, Unit 2 and 3, Holford Way, Holford, Birmingham B6 7AX. Tel: 021-365 3388

SOLO Flight is an American real-time flight simulator which has been around quite some time. This is an updated version, providing a better cockpit control layout and a built-in flight trainer.

The simulation is based around the light monoplanes of the late 1920s and early 1930s, particularly the Ryan S-T series, and offers flying practice together with a Mail Pilot game in which you can put your learned flight skills to a considerably stern test.

The screen display is unusual. The bottom half is taken up with the expected cockpit controls while the remainder provides a view not only of the landscape but also, oddly enough, of your plane.

Your viewpoint is from just above and behind your plane, from which a shadow is cast at low altitudes. You can also switch to a left, right or backward view from the cockpit.

While it might seem a bit strange at first, it works out quite well and makes flying the plane that much easier.

The comprehensive and clear instrumentation includes indicators for throttle, airspeed, altitude, artificial horizon, vertical velocity, flaps, and VOR radial. There is also an altimeter, fuel gauge, lights for brake, landing gear and engine overheat, DME (direct measuring equipment), ILS glide-slope indicator and magnetic compass.

In Flying Practice mode you can select the American state you will fly across (Kansas, Washington or Colorado) and the weather conditions: clear, windy or IFR (instrument flight rules - low cloud).

Or if you prefer, you can simply practice landing.

You can also be accompanied by an on-board flying instructor. The instruction takes the form of text messages such as "You are too high. Push forward", which appear across the bottom of the screen.

Each message repeats until you obey it, but the tuition can
be switched off at any time by a single command. There is no speech synthesis in the Atari version.

In Mall Run mode your job is to deliver sacks of mail across different states to their destinations in as short a time as possible. You can select the level of difficulty from student (easiest) to command pilot (most difficult) and decide which destinations and how much mail and fuel to carry. As the game progresses weather conditions deteriorate and, depending on the skill level selected, your plane may develop mechanical and instrument malfunctions.

The graphics are fairly rudimentary and the display a little slow and jerky.

Even so, this unusual flight simulator is pleasantly easy to get to grips with, particularly given the presence of the onboard instructor. The Mall Run option is an added bonus. Enjoyable and entertaining, the new Solo Flight has much to commend it.

Bob Chappell

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**The big topper**

Program: Ballyhoo
Price: £27.95
Supplier: Infocom, c/o Silika Distribution, 1-4 The Mews, Hatherley Road, Sidcup, Kent DA14 4DX.
Tel: 01-309 0300.

WHAT connection is there between a sucker, an Annie Oakley and a First of May? All those who shouted “Circus!” give yourself a cuddly toy. To put the rest of you in the picture, a sucker is a circus-goer, an Annie Oakley is a ticket and a First of May is a novice circus performer.

Now the only reason I happen to be knowledgeable about circus lingo is because I’ve been playing Ballyhoo, Infocom’s latest standard level text adventure. In Ballyhoo, all the action takes place in a circus where the shabbiness of this particular big top is matched only by the seadiness of the performers.

Loitering after the show was over, I managed to eavesdrop on a conversation between the circus owner, Munrab (try spelling it backwards), and a private detective. It seems that Chelsea, the owner’s daughter, has been kidnapped and might have been stashed somewhere on the circus lot. Since the gumshoe appears to be about as competent as Groucho, I decided upon a little sleuthing of my own.

The adventure is full of fun and originality and I got to meet many interesting characters. For instance, there is Tisa, a lady so fat she occupies two locations at once! When I tried to get a little closer to her massive bulk I was told “The slope’s too steep!”

There is more to Comrade Thumb, a diminutive Russian, and the indolent named Chuckles, a surly clown, than first meets the eye while a visit to Andrew Jenny (half man, half woman) proves a most confusing experience. And having my bumps felt, palm read and being placed in a hypnotic trance by Rimshaw the incomparable are not things I shall forget in a hurry either.

Then there are the animals. Fascinating my chances as a lion tamer, I stepped boldly into the lion’s cage to put them through their paces. Exit stage right, ripped to pieces but somewhat wiser. Maybe there was better luck to be had with Mahler, the fearsome gorilla. The question was – should I enter his cage wearing that ridiculous gorilla costume I’d found lying about?

Drawing a veil over my experiences with Mahler, I turned to my exploits as a high-wire artist. Here I had the opportunity to excel - and would have done if some roustabout hadn’t removed the safety net when I wasn’t looking. Result – back to being the human platypus in one of the sideshows.

The mystery and danger intrinsic to the plot of Ballyhoo is well-seasoned with wit and humour. I particularly enjoyed an encounter with the Egress - a rare but ferocious mammal – and, elsewhere, being able to vent my feelings during the moment between doing something painful and actually feeling the pain.

Yes, Infocom has done it yet again. Ballyhoo is a superb adventure, full of intrigue, originality and intelligent humour. Don’t miss it.

Bob Chappell

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**Sound** ....................... 5
**Graphics** ................... 7
**Playability** .................. 8
**Value** ........................ 8
**Overall** ...................... 8
Now let's get things moving...

Part Four of STEPHEN WILLIAMSON'S series on player missile graphics

THIS time I will show how to move players around the screen by using animation techniques.

Program I demonstrates the basic method for moving players. The first section, lines 50 to 150, contains the standard player missile initialisation routines that you will be familiar with if you have followed this series so far.

POKE 755,0 in line 50 switches off the cursor, so if you stop the program and want to switch the cursor back on, either press Reset or type POKE 755,2.

Moving a player horizontally is straightforward. You simply increase or decrease the value held in the horizontal register corresponding to the player you wish to move. A list of these registers was given last month, but in case you do not have a copy handy, they can be summarised as follows:

- Registers 53248 to 53251 are the horizontal registers for players 0 to 3.
- Registers 53252 to 53255 are the registers for missiles 0 to 3.

One problem with the horizontal registers is that you cannot PEEK them to find out the current horizontal position of the player or missile stripe.

If you type:

POKE 53248, 140:
PRINT PEEK (53248)

you would expect the micro to print the number 140, the value you have just stored in location 53248. Instead you get the number 0. So where has 140 gone? The Antic chip has taken 140 into its inner workings, altered the horizontal position of the player stripe accordingly and then immediately reset the value held at 53248 to 0 before the PRINT PEEK (53248) instruction has been handled. This is all very inconvenient if you want to keep track of the horizontal coordinate of the player stripe.

For most animation procedures we need to assign a variable to hold the current player stripe position. Line 170 of Program I uses the variable HORIZ to store the current horizontal value of the player 0 stripe, which is initially 130.

Line 180 assigns another variable,
S to hold the value of STICK(0) which is the status of the joystick. The values are 11 - left, 7 - right, 14 - up, 13 - down and 15 - centre.

Lines 190 and 200 check to see whether S is 11 or 7 - joystick pointing left or right and alters the value of HORIZ by one according to which direction the player is to move.

Line 210 POKEs the value held in HORIZ into the horizontal register for player O, to move the player stripe one position to the right or left. Each movement of the player stripe is equal to the width of one pixel.

The display at the bottom of the screen gives the current horizontal value. At a value of 48 the player starts to leave the blue area and moves across the background until, if you continue to move the joystick left, it will move off the screen. You can continue decreasing the horizontal value although this will have no effect on the screen display.

If the value of HORIZ goes below 0 or above 255 you will get an error message as the program reaches line 210 and tries to put the value of HORIZ into the horizontal register 53248. This is because you cannot poke a number more than one byte or less than 0 into a single memory address.

To avoid this problem, it is normal for a player missile program to contain error trapping routines. Program I does not have error routines so that you can experience what happens when you try to move a player too far, but Program II does include one.

So much for horizontal movement, which is simple to operate. When it comes to vertical movement things are a little more complicated. It is not actually possible to move the player stripe vertically. It will always stretch from the top of the screen to the bottom, no matter how many or how few pixels are plotted within it.

We saw last month how, when you store the shape data into the appropriate player data area, the distance within that area from which you start to load the data determines the vertical position of the shape. This is why, in line 100, the data for the player shape is loaded 140 bytes from the base of the player O data area to make sure that the bug appears part way down the screen.

If you alter line 100 by changing the 140 to 141, the bug will appear one pixel further down the screen. 139 would display a player one pixel further up.

It should now be obvious how to give the illusion of vertical movement. We need a routine to move the whole of the shape data one byte further up or one byte further down in memory. Line 250 performs this function.

First, line 170 assigns the variable VERT to hold the current value of the vertical position of the player in the same way as the variable HORIZ.

Lines 230 and 250 check for the up and down positions of the joystick and increase or decrease the value of VERT accordingly. If the joystick has been moved up or down then the variable V is set to one. V acts as a flag. When V is one then the vertical movement routine in line 250 is actioned. When V is zero, and therefore no vertical movement is required, the routine in line 250 is ignored.

The routine in line 250 is similar to the shape data loading routine in line 100 and loads the shape information into the player 0 data area. Instead of adding a fixed value of 140 like line 100, the variable VERT is added to the base address of the player 0 data area (PBASE + 1024) so that the bug will appear to move a distance equal to one pixel up or down.

The data statement for the player 0 shape is contained in line 290. Notice that there is a zero at the beginning and end of this shape data which is there to erase the previously plotted pixel from the top or bottom of the last player shape.

To see what happens when this is left out, alter line 290 by deleting the two zeros, and change the loop count in lines 100 and 250 from 12 to 10 so that the correct amount of data is read. Now when you run the program, strange things happen! A trail of pixels forms as you move the joystick up or down.

The RESTORE statement in line
180 allows the data to be re-read in line 250.

You probably won't be very impressed by the Program I demonstration of vertical movement. The bug is not very lively, travelling more like a snail than an insect, with a rippling effect as the pixels are repotted.

There is not much that can be done about this if we are to stick to Basic. The repploting routine in line 250 takes time, and there will always be a noticeable delay as the program keeps updating the information held in the player data area.

If you want to add some zest to the program, you have to enter the realms of machine code.

Program II is an improved version of Program I that includes two machine code routines, one for up movement and the other for down.

Don't worry if you do not have a clue about machine code. The two routines can be copied and included for use in your own player missile programs without having to understand exactly how they work.

If you run Program II it will at first look very much like Program I with the same bug moving for you to manoeuvre it with the joystick. But when you move it up or down you will see that the animation is much smoother.

Line 170 reads the data contained in lines 300 to 370 - the machine code routine - and stores it in the unused part of the player missile data area. This unused area is not needed by the player missile system and is 768 bytes long for single resolution players and 384 bytes long for double resolution players - plenty of room in which to store machine code routines. See the player missile data area map in July's Atari User.

The first routine - 21 bytes long - is placed in the unused area from PMBASE upwards, and the second routine starts at PBASE plus 21.

The routines as they stand will control any player or missile up to 20 pixels in height. To use the routine for taller players, alter the number 22 in line 340 to two greater than the player height, and the 21 in line 360 to one greater.

Horizontal movement in Program II is handled in the same way as Program I. An error trapping routine has been inserted in lines 220 and 230 that stop HORIZ becoming less than 48 or more than 202. This means that the player cannot leave the playfield 0 area and, of course, it also prevents an error message occurring due to the value of HORIZ going below 0 or above 255.

Lines 250 and 260 control vertical movement by calling up the machine code routines.

VERT, the vertical coordinate variable, is first checked to make sure that it is not greater than 32 or less than 212 - when the player is at the top or bottom edge of the playfield - before passing control of the program to the appropriate machine code routine.

The formula for using the routine is:

\[ A = \text{USR} \left( \text{machine code address, player address plus vertical position} \right) \]

Following this formula, the call-up routine in line 250 becomes:

\[ A = \text{USR} \left( \text{PMBASE, PMBASE} + 1023 + \text{VERT} \right) \]

The up machine code routine starts at PBASE and the down routine at PBASE + 21.

For the routines to operate correctly, VERT must be increased or decreased by no more than one at a time.

After the routines have been called up and the player replotted, VERT is adjusted by one ready for the next replotting operation.

Once you know the correct data for the up and down machine code routines then operating them is no more difficult than the pure Basic routine used in Program I - but the effect is much better.

Program III introduces another animation effect and another machine code routine. In this program the
shape data is not initially loaded into the player data area, but is stored in the unused portion of the player missile area by line 120.

Twenty-six numbers are read, which are made up of two 13 number shapes. The first is the familiar shape of the bug seen in Programs I and II, and the second looks like the bug without its wings.

The machine code routine is loaded into page 6. Addresses 1536 to 1792 — page 6 — are not generally used when Basic programs are running, so can be used as an alternative location for storing machine code routines, as long as these do not exceed 256 bytes in length.

Again it is not necessary to understand how the machine code routine is written. What the routine does is transfer the contents of a specified area of memory to another area of memory. This can have many applications, but it is ideal for use with the player missile graphics system. The format to access the routine is:

A=USR (machine code address, from address, to address, number of bytes)

Line 280 uses this routine to transfer the contents of the first 13 bytes above PBASE to the appropriate area within the player 0 data area. Once again, as in Program I, the vertical position is decided by the variable VERT.

Line 290 then takes the next 13 bytes above PBASE and stores them in the same place within the player 0 data area.

The effect is to display the bug shape on the screen, immediately followed by the shape of the bug without its wings to give the illusion of flapping wings. However this type of shape Swapping animation is not restricted to two shapes. Using more than two can create much more sophisticated animation - figures walking, or Pac-men gobbling for example.

Whether you use this routine or those in Program I is a matter of personal preference. I prefer the Program II routine because, although it is longer - 81 bytes as against 42 for the other two - it is more adaptable.

Try changing Program III by altering the shape data, or including more than two shapes to create your own animation epic.

So far, to keep things simple, I have shown how to display and animate one shape at a time. Next month we will look at how to display more than one player, and at how players and playfields can interact with each other.

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LET’S give your computer the power to control mains appliances. It can be operated directly from the keyboard, by a Basic program, or by external sensors such as light or heat detectors.

There are two independent channels, expandable to four, and each channel can handle 750 watts. For now we'll look at the electronics and theory of operation. Next month we’ll describe the practical construction and programming.

Safety is our first consideration because, no matter what design is used, the control box must have a mains cable going in at one end and a joystick lead coming out of the other.

If ever the twain should meet, your computer—or at very least its PIA chip—will rapidly depart this life, and may attempt to take you along with it.

This design has two separate stages of protection—an opto-isolator on the input circuit, and mechanical relays to handle the mains voltage outputs.

Let's look at the opto-isolator first. Figure I shows in schematic form how it works—you may recognise the symbols from last month. It has two components, housed together in a light-proof package. The input is a conventional light-emitting diode and the output is a phototransistor which switches off in darkness and on when illuminated.

The only link between input and output is a beam of infra red light, and there’s no way that high voltages can cross the gap. Your computer sees only the LED side—all the dangerous work is done by circuitry which it never needs to know about.

Since our controller has two channels we need two opto-isolators, and for convenience we've used a dual type which has everything contained in a single 8 pin package.

A second level of mains isolation is achieved by using mechanical relays to do the actual switching. Relays come in many shapes and sizes, but they all work on the same principle—see Figure II.

A coil of fine wire generates a magnetic field when current flows through it, and the magnetic attraction is used to operate one or more sets of switch contacts. The coil uses little power and can operate on low voltages, but the switch contacts can handle much higher voltages and currents.

Since the coil is heavily insulated from the switch contacts, mains voltages cannot get through to the low-voltage lines.

Figure III shows the circuit for the complete mains controller, with its three distinct stages. Stage 1 is the LED circuitry which connects to the computer via a joystick port, and operates on power from pin 7 (+5V).

Control signals are taken from pins 1 and 2 via resistors R1 and R2, to the base leads of TR1 and TR2, where they are amplified and made to drive LEDs A and B inside the opto-isolator. Resistors R3 and R4 limit the current through each LED to around 8mA.

The two jacks are optional—they connect to the joystick port's analog inputs, so you can use external sensors—like light detectors or central heating thermostats—to control the switching action.

Stage 2 operates on a nominal 12V DC from transformer T1. The power supply is not critical, so the circuit uses a simple bridge rectifier—BR1—and smoothing capacitor—C1. The output from this network is around 14V when no load is connected, falling to 12V or so when the maximum current—about 500mA—is drawn.

An auxiliary output is provided on the terminal block so that you can tap this supply for other purposes if you wish.

When phototransistor A switches
on its collector voltage falls towards 0V, causing TR3 to switch on. Current therefore flows through the coil of Relay 1, and switch SW1 operates. The same happens with TR4, Relay 2 and SW2 when phototran-

sistor B is activated. Diodes D1 and D2 are included to suppress the voltage spikes which relay coils tend to generate.

Stage 3 is the 240V AC section containing the two relay switches, each with a capacitor across its contacts to suppress sparking and mains interference. You can see that if everything is wired up correctly there is no electrical path from the mains supply to the computer.

Even if stage 2 were to become live – for example after an insulation breakdown in the relays or transformer – the opto-isolator still provides protection.

A printed circuit board is used to hold all components as this greatly simplifies construction. If you have facilities to make your own, the foil pattern is shown in Figure IV with the drilling schedule in Figure V.

If you don’t fancy making one yourself it’s a lot easier to buy the commercially produced board from RH design – see details in the panel – especially since this comes drilled and tinned ready for use.

The basic design will suit most
domestic applications, and it can easily be adapted to handle specialised jobs. For example, you could use a different type of relay: it won't fit on the PCB, but leads to the coil can be taken from points A and B. Relay 1, or C and D—Relay 2, which are marked on the board.

You could drive two or even three relays simultaneously from each output should your application demand more current or a more complex switch configuration. It doesn't matter which way round the coils are connected, and the output transistors can each handle up to 500mA.

Mains currents in excess of 5 Amps should be kept off the PCB, so use a large screw terminal block or a junction box to connect the switch contacts of any off-board relays.

There is enough power available from the joystick ports to drive two extra channels, making four in all. Use two PCBs and connect joystick pins 3 and 4 in place of 1 and 2 on the second board.

The specified transformer will supply enough current for all four channels, so you can omit T1, BR1 and C1 from the second board, and just connect the 12V and 0V output terminals from one board to the other.

If you plan to drive several relays from each output ensure that their combined coils will not draw more than 500mA or you will need a more powerful off-board transformer. The bridge rectifier can handle 1.5 Amps at up to 35V.

Next month we'll cover the constructional details, testing and programming.

**PARTS LIST**

- Capacitors: C1 470mfd 25v PC electrolytic FF16S, C2, C3 0.047mfd 250v AC suppressors FF55K.
- Semiconductors: TR1, TR2 BC108, transistor QB32K, TR3, TR4 2N2905 transistors OR17, D1, D2 1N4148 signal diodes QL80B, BR1 W005 bridge rectifier QL175S, IS1 dual opto-isolator YY62S.
- Connectors: J1, J2 3.5mm PCB jack sockets FK02C (optional), 1 8pin DIL IC socket FJ63T, 2 Euro facility chassis sockets HL42V (optional).
- Miscellaneous: 2 12V flat relays HY20W, 1 PCB mains transformer 9V YJ53H, 2 Chassis fuse holders 20mm RX49D, 2 3.15 anti-surge fuses 20mm RA11M, 1 Joystick extension lead (eg Tandy 276-1978).

Printed circuit board — order code DBP1 — available from R.H. Design, 137 Stonefall Avenue, Harrogate, North Yorks, Tel: 0423 508359.

Price £3.95.

Other components available from Maplin Electronic Supplies Ltd, PO Box 3, Rayleigh, Essex SS6 8LR, Tel: 0702 552911.

Approximate cost £18 plus case.
LET'S start with a success story. Darren Dodds from Tyne and Wear has the answer for Joy and Dave who were struggling with Quasimodo from Synsoft a little while back. They wanted to know how to get the second jewel back to its casing. Well here's how.

Come back after getting the jewel and climb down the ladder to the platform. From here you then jump onto the first rope in the series of three to the left, but you must not jump to the next rope until there is a gap in the bats.

The gap will appear after 10 bats and you can then proceed. Jump to the next rope and climb immediately to avoid being killed by the pesky bats. You can then jump across to the next rope when there is another gap.

Do not jump across to the last rope until a bat flies up behind you. Then jump to the next rope, go down and jump to the next ladder. You then do exactly the same for the next layer.

So there you are, it was as simple as that. Darren signs himself up as a newcomer to *Atari User*, and a very valuable one at that if I may say so.

Joy and Dave can now attempt to get the third jewel, while I try to find out how Darren can progress after getting the skeleton from the horse in English Software's *Meditor*. Perhaps Joy and Dave know the solution.

Two people are stuck on The Pay-Off from Bignose/Atari in exactly the same place. They are both keeping each other company on top of the fire escape having disabled the alarm, yet they are unable to get through the window without disturbing the guard inside.

Messrs Purviss and Hillman are desperate to solve this one for their sanity, and in Mr Purviss's case for the sake of his future marriage.

To get past this obstacle you must remember that a jewel thief requires sticky fingers, and this may lead you to a very professional method of stopping the glass from crashing into the bank and waking the dozy guard inside.

Of course you will still need to find a way of getting the gem from the window frame, so you may have to read more into this solution than is at first apparent.

Nigel Burton has come up with the answer to my question on *Hitch Hikers Guide to the Galaxy*, and the strange vocabulary identified by the *Zorktools* kit.

*Wimugu* is the equivalent of screaming. However Woonbe is apparently the writer of a slimming guide book, *Galaxia Woonbeam*. As in all instances you should consult the source of infinite knowledge for further details. A large T-shirt for your help is on its way Nigel, with my thanks.

E Mykow also contributed a neat little drawing of the Wimugu of Woonbe County which although not the winner, was a worthy entry. Mr Mykow is also struggling to get past Tarzan in Morden's Quest from Melbourne House.

He assures me that he will persevere to solve this game, and I can tell him that he is closer to solving it than he thinks. In this game persistence will be rewarded time and time again.

For this clue, and a comprehensive map of the game, I am indebted to Peter Dean. The map is laid out very clearly and, as Peter comments, the password is the only obscure part of Morden's Quest.

From the map I see that you ought to be able to trace a route avoiding Tarzan. That should give you enough time to find the answer to the question.

I also note from a previous letters column an enquiry about adventure writing programs for the Atari. The only known program is *Adventure Writer* from Codewriter Inc, who no longer trade.

Gilfoyle, from who the program was licenced, has no plans to release *The Quill* for the Atari, so there will be no flood of amateur adventures as on other more fortunate machines.

The only adventure I know of that is so written for the Atari is *The Quest of Abraham Smee*. Andy Warwick advised me of its existence, and also of the Glitch of the Month, in *Adventure Quest* from Level 9.

At the glass door in the Black Tower you do not have to hold the Mist Stone, merely type IN and you will be there. A medium size T-shirt is on its way Andy, and thanks for the info.

Sorry I couldn't review the games I mentioned last month, but they never arrived! Better luck next time.
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By STEWART BULLOUGH

OUR hero in this game is Frank, a greedy little fellow whose main aim in life is to collect and eat as much fruit as possible.

To this end you must guide him around eight different levels, each a little harder than the last, until he has devoured all of the fruit that lies scattered around.

Your time is limited though, and as you play you will see the timer at the bottom of the screen tick away relentlessly. You must find the fastest and safest route around each level in order to complete it before your time runs out.

Frank is moved left, right, up or down by moving the joystick in the appropriate direction. He can also jump by holding down the trigger button as you move the joystick. However he can only jump to something which is on the same level as he is.

If Frank can get right to the edge of a platform he can often jump that little bit further, and there are many shortcuts to be found by using this method.

Scoring is very straightforward – for each piece of fruit collected you get 10 points, and each time unit remaining upon completion of a level will gain you a bonus of 100 points.

After you've completed all eight levels you go back to level one at a higher difficulty setting.

There are four difficulty levels, and you can choose them from the main title screen by using the Select button. The higher the level, the less time you will get to finish each screen.

The machine code PMG routine was written by Anthony Hughes. This little routine is really good, and can store up to 48 different frames, so credit where credit’s due for a great subroutine.

After typing in the listing check it with the Got-It-Right! program – see Page 33 – and when it is all correct SAVE yourself a copy and simply type RUN.

The initialisation will take just over a minute, so be patient and wait for the game to begin.
Get it right!

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August 1986 ATARI USER 29
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"Page 6 has done nothing but become better each issue!"  
"Very good magazine - it has helped me a lot!"  
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"Excellent!"  
"Well balanced magazine with interests for everyone from beginner to advanced!"  
"Excellent mag, improves with each issue. Good balance of content!"  
"The best Atari mag on the market!"  
"A life-line down in Australia!"  
"Excellent magazine - very good value. Always good articles, reviews, programs, etc..."  
"Best thing since sliced bread!"  
"More appealing than any Page 5!"  
"Well set out - programs I have tried have been good quality!"  
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"Excellent and informative!"  
"Every Atari user shouldn't be without it!"  
"Please continue to the same quality standard!"  
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"The mag all owners of the best computers should get!"  
"Page 6 is simply the best magazine available - well done!"  
"A well balanced and informative magazine. I may have lost interest without it!"  
"Indispensable!"  
"A very fine mag., "yes, keep it up!"  
"Roll it! Look forward to it!"  
"Page 6 is a very interesting and enlightening magazine!"  
"Super mag!"  
"Wouldn't be without it!"  
"Our only praise Page 6 for filling the needs of Atari owners. It has all the ingredients of a true users magazine, no please do not change it!"  
"Brilliant, comprehensive and very useful!"  
"It is the best magazine available here in Holland!"  
"Just keep up the good work and long live Page 6 and Atari!"  
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PAGE 6 - COMPLIMENTING AND EXPANDING THE WORLD OF ATARI
LAST December we printed an innocent looking little program called Get-It-Right! Since that time the December issue has sold like hot cakes, until we now find that we’re completely out of stock.

Since many of you have been writing in asking about Get-It-Right! over the past few months we have decided to reprint it for you, with a couple of extra features.

The purpose of this program is to provide you with an easy way to make certain that you have typed our listings in correctly, and to show you exactly where any errors are located.

Firstly sit down and type in the listing below. If you are using cassette rather than disc you should modify line 1010 as detailed in line 999 of the listing.

Once you’re quite sure that you have got it right, SAVE a copy on to your tape or disc. This will be your master Get-It-Right! program.

Now to check a program you have just typed in from an issue of Atari User, use the following procedure:

Firstly SAVE a copy of the program you’ve just typed in on to tape or disc. This is your secure copy, just in case anything goes wrong.

Now create a listed version of the program by typing:

LIST “C:”

or

LIST “D:filename”

Note that the normal filename to may RUN your program in the sure knowledge that it is as we printed it.

If not, check the program lines against the listing, and repeat the above process from the first step.

If you are working on a long program you may need to type:

[Control-1]

as the screen fills up to pause the display. Press it again to restart.

A few tips: If the error has occurred on a REM or a PRINT line it may not be fatal, and your program may run OK.

If it occurs on a line with DATA, or machine code characters – those funny little graphics shapes – make sure that you have corrected the problem before you try to run the program.

All that remains for you to do now is type in the listing. For a bit of practice you can even check Get-It-Right! with its own checksum just for good measure. Unless of course you got it wrong...
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34 ATARI USER August 1986
CALLING ALL CARS - ON AN ATARI 130XE

Basic cartridge, as provided with the old 400 and 800 computers.

Your 800XL (and the 130XE) has the Basic language built inside the casing, and so you don't need the cartridge at all.

When you are asked to "plug in your Basic cartridge and switch on", all you need to do is simply switch on.

If any program or game requires you to remove the cartridge, just hold down the Option key on the keyboard as you switch on. This will disable the built-in Basic and act as though it wasn't there.

Database on tape

I OWN an 800XL with a 1010 recorder, but after a fruitless search of the shops in my area I have found it impossible to obtain a database/spreadsheet on cassette.

Although I am learning programming I am not good enough to write a program for my needs - I own hundreds of records and would like to be able to catalog them for easy access.

Therefore could you please inform me of any database/spreadsheet and how to get it?

- R. Goit, Richmond, N. Yorkshire.

- Unfortunately you're quite right - there isn't a decent database/spreadsheet available on cassette for the Atari.

Really, these applications need a disc drive to be effective, as cassette handling is so very slow.

Your best bet would be to buy yourself a second-hand disc drive, and get a copy of Mini Office II for the Atari when it is released shortly.

This features both a database and a spreadsheet, plus a word processor, mailmerge, graphics package and communications software all on one disc. You'll find it the cheapest way to buy these items.

600XL upgrade kit

I HAVE good news for 600XL owners who have been looking for a cheap upgrade kit.

A firm in the States has one for $35 US - shipping included - that will make a 600XL perform exactly like the 800XL.

I recently installed one for a friend of mine in about 30 minutes, and she now has 37,902 free bytes and can run any of the software I have for my 800XL.

The kit consists of two new RAM chips and three jumper wires, two of which require some simple soldering to install.

The instructions are simple and easy to follow. The firm is happy to ship over here as long as payment is in US dollars - such as an international money order.

The company is: Computer Service Land, 1073 W. Broad Street, Falls Church, Va., 22046, USA. - Bob Matiska, USAF.

XL-XE compared

I AM thinking of buying either an Atari 800XL or 130XE.

I can get an 800XL plus 1050 disc drive for £130, but the lowest price I have seen for a 130XE + 1050 disc drive is about £240.

I rather like the 130XE's styling, but this isn't the best criterion for choosing a micro.

I know it has an extra 64k of paged memory, but I have read that little software exploits this.

Does the 130XE have any other different features to the 800XL, and if so are they supported by enhanced software?

- Marcus Groan, Manchester.

- The 130XE is the same as the 800XL in most respects, and has all of the features provided by its smaller brother.

It does of course feature twice the memory capacity. This is implemented as four 16k banks of RAM, which can be switched in and out as required by the user.

Various software packages use this extra memory, including the DOS 2.5 ramdisk, SuperScript word processor SynFile database and SynCalc spreadsheet.

Also Basic XE from OSS will allow you to write programs of up to 64k, and provides a further 37k for data, strings, graphics and so on.

It also maintains complete compatibility with standard Atari Basic.

'Missing' memory

WHENEVER I type: PRINT FRE (0)
on my 800XL I get the answer: 37902.

I know that the self-test built into the computer uses some memory, but surely not 26k.

Is it possible that I could have destroyed a chunk of RAM by inadvertently switching on the computer/recorded in the wrong sequence?

If so, surely I would not have been the first novice programmer to do so.

- Patrick E. Granger, Rotherham, South Yorkshire.

- Don't worry, you haven't damaged your computer - this figure is perfectly normal.
Just be thankful you aren't using a 130XE, as you'd have lost 90k of memory, by your calculations, if that were the case.

Although the 800XL has 64k of memory it uses only 6502 chip that it can only access a total of 64k - including all of the operating system in ROM, Basic itself, your screen and so on.

The OS is 16k long, and Basic is 8k. The screen is 1k and various special areas for input and output take up another 1k or so. Thus you have just 'lost' 28k.

The area under Basic and the OS is still there as RAM, but you can only get at it by turning one or the other off, and thus sending your Basic program into never-never land.

If you really want to access this extra RAM you must leave a small machine code program in memory when you turn the OS off in order to stop the system from crashing.

**Ramdisc on 130XE**

I WISH to use the ramdisc facility on my 130XE offered by DOS 2.5 when using VisiCalc. Which disc do I boot first? - Tim Brett Holt, Camberley, Surrey.

- Unfortunately VisiCalc comes on a protected disc with Atari DOS 2.0 provided.
- It would be quite hard to reformat the disc to use DOS 2.5, so without any detailed technical programming experience, you'd probably be best sticking with VisiCalc as it is.

**Better disc labels**

YOU may have noticed that it is very difficult to buy floppy disc labels and write-protect tabs separate from a box of floppies.

In searching for a suitable alternative I got a packet of self-adhesive coloured labels from a well known High Street stationers.

These labels seemed to be more useful than standard write-protect tabs since they would double as a colour-coding system.

Naturally I used the real labels to protect discs that I must not write on under any circumstances. However that proved my downfall...

The write-protect circuitry in the Atari disc drive uses infra red light to sense the presence or absence of a write-enable notch, and infra red goes straight through these labels.

I formatted two discs containing valuable programs before I realised what was happening. This type of write-protection is worse than none at all since it inspires a false sense of security.

The moral of the story is keep trying to find the correct labels, or if you must use coloured labels use any colour other than red - blue or green would be best. - Jolly Roger, Winnersh, Berks.

**Using checksum**

COULD you tell me how to use your checksum. I have tried to follow your instructions in the March issue of Atari User, but have had no success.

I do not understand your statement: "Now load Get It Right! into the machine, taking note of the instructions contained in line 999".

I have typed in all your games since I got my 800XL in January 1986, and only two have worked. It is so disappointing to sit for several hours typing in and then find nothing happening. - David Brunton, East Lothian.

**Four line listings**

IT said in the manual for my 800XL that no listing should exceed three lines, but in your October issue the Pontoon game had three listings of four lines.

So we made each listing in two lines instead of four. The game worked all right but is a bit fussy on the writing.

In the January issue you have a listing in Mr Humpy with four lines. We did the same and split the line in two. The game works quite well but I wonder if it is all right.

I have read the Atari handbook and it says you can write listings of four lines or more but does not say exactly how.

It just says to play about with the CLR, SET or TAB key. Could you explain how to write these lines? - N. Meadows, Bideford, Devon.

- The computer can only accept a maximum of three screen lines of input for any given program line and there is really no way to get around this.
- However there's nothing to say that you can't try and pack as much into those three lines as possible.
- Firstly, before you start typing in your program type:

  **POKE** 82,4

  This will set the margin to 0, so giving you back the two empty spaces at the start of each line.

  If that still doesn't give you enough room to enter a given line use abbreviations. Thus if a line of a listing reads:

  10 GRAPHIC 0; BCOLOR 1,0,14; POSITION 4,4; PRINT"HELLO"

  try typing in:

  1088.8161.0,14POS4,4;PRINT"HELLO"

  The computer will understand the two as meaning the same thing and when you type LIST you will see the full version, not the abbreviations.

  Consult your manual for the correct abbreviations for all of the Basic commands - most are the first few letters followed by a dot.

  By using both of these methods there are no lines of program that you should ever have any problem with.

  Don't forget someone had to enter them into the same type of computer in the first place, so they must go in.
Silencing disc din

I HAVE an 800XL with disc drive and was plagued with a terrible din everytime I used the drive.

Not knowing any better I thought this was normal, but after talking with John Lawson at Computer Stuff I found out there is a simple way to silence the drive.

Just disconnect all wires to the drive, turn it upside down, undo the screws and turn the drive back the right way up.

Then take off the lid, apply a very small drop of ear-ex to the head runners - being very careful not to get anything on or near the head - and finally just put it all back together. – K.J. Newton, Hertfordshire.

Paint dump program

I AM the proud owner of an Atari 800XL, disc drive, cassette recorder and 1029 printer.

The keyboard and disc drive came in a Dixons pack, with which I received The Home Filing Manager, The Pay-off and Paint.

When I added a printer to my system I chose the Atari 1029, this came with Atariwriter and Dump1029.

When I booted up Dump1029 I discovered to my dismay that the program would only dump 62 picture files.

Rather than write my own dump program I decided to write a modifer program to turn Paint files into 62 picture files.

I worked out that in Mode 7 - which Paint works in - it took two bits to define each pixel as there are four colours in Mode 7 and there are also four different combinations of two bits - 00, 11, 10 and 01.

Because of this it takes 40 bytes for each screen line in Mode 7.

Getting back to the problem, Dump1029 would only accept pictures drawn in Modes 0 or 15. So to convert Paint files to Mode 15 files all I needed to do was duplicate each 40 bytes.

Not quite so. Paint does not use all of a Mode 7 screen, so extra zeros must be added to the end to make the total number of bytes up to 7680 (192 x 40).

I have written the following self-explanatory program to overcome this problem.

- Jarom Young, Banbury, Oxon.

On the Yukon trail

IN reply to Robert and Karen Evetine's letter in the July 1986 Mailbag, to find Yukon Yetan you must fill up the Hi-score table.

Once it is full, play the game once more so that your score is bigger than the last score on the Hi-score table.

Enter your name and the lowest score will be brought down off the table and your last score will go up. Then two bulldozers will squash the abandoned lowest score and Yukon Yetan will arrive on a lift, walk over to the squashed score and kick it off the screen.

Yukon can be either smoker or gum-chower. I hope that answers your question. – Frank Driver, West Town, Peterborough.

Matthew Burroughs, of Ormskirk, also provided this solution. Our thanks to you both.

The dump that doesn't

WOULD you publish a 1029 dump program John, and many thanks for the tip.

We're sure that many other readers will like the extra facility of printing Paint files as well as Micropainter and Touch Tablet pictures.

- We're glad you liked the 1029 dump program John, and many thanks for the tip.

Store data in ramdisk

I WOULD like to know if the Atari 130XE is a 64k or 128k computer as I am writing an adventure which is likely to take up more than 64k or memory.

The manual said that to get 131,072 bytes - 128k - of RAM type the following:

Poke 54017, 193-4a

and then press Return. It came up with Ready so I then typed:

Print FRE (0)

and it came up with 37902 bytes free which is not 128k of RAM.

Can you help me? – Richard Powell, Woodhouse, Sheffield.

The 130XE is indeed a 128k computer, but you must remember that Atari Basic only supports 37902 bytes of memory after the OS and graphics overheads have been removed from the main 64k area. The four extra 16k banks can be accessed as you described.

Perhaps better still you could use DOS 2.5 to store your data in to the ramdisk and read it back again as a file each time you need it. The ramdisk is very fast, so you shouldn't notice any appreciable delay.

Flight simulator

IN your May 1986 Mailbag there was a letter from Alex Ford who was interested in flight simulators.

Has he had a look at Digital Integration's rather good Fighter Pilot?

Could you help me find some books on Atari? No one in my area stocks them, so where do I go? – R. Hadleigh, Redditch.

- Thanks for the advice on the flight simulators, of which there are now quite a number, including Jump Jet and Flight Simulator II.

As to your question on books, if you can't find anywhere locally why not try one of the larger mail order companies?

Both Software Express and Sycorax Shop should be able to help with most types of book and, also give you advice on which titles would best suit your needs.

This would be far better than ordering blind from W.H. Smith, for example.

Monitor mismatch

OWN an Atari 800XL with a 1050 disc drive and 1020 printer.

A few weeks ago I was given an Amstrad CT64B monitor, but I found that the 6 pin plug wouldn't match with the 6 pin DIN socket of my Atari.

I have tried to find information on how to connect the monitor to my computer, but
nobody seems to know how. Can you please help? — K. Zannis, Lower Keralo, Salford.

- The Amstrad uses a system called RGB to connect to its monitor, and the 800XL uses a completely different method known as composite video.

Unfortunately there is no easy way to get the Atari to talk to the Amstrad monitor. You will need to get a composite monitor rather than an RGB one.

**Cleaner graphics**

**HOW do the professionals draw graphics for games so it does not leave a trail and doesn't flash?**

- Can you give me a short program on how to draw moving graphics, and can you also tell me how to combine two graphics modes? — Merlin House, Hockley, Essex.

- Although your question is simple enough the answer is very complicated indeed. To make a game look as professional as a purchased one you will need to write it in machine code.

That said, you will get some good hints and tips on how to get your games working a lot faster if you have been following our series on Player/Missile Graphics which started in the May issue.

We covered display lists — which allow you to combine different graphic modes on a single screen — in Mike Rowe's series of articles which ran from July to December 1985.

**Simpler scrolling**

PEREGRINE Hills' solution in your May 1986 issue to Atari's rather fast scrolling was somewhat longwinded and I'd like to suggest some simpler methods of handling this problem.

I think it's even mentioned in the inadequate Atari Users Manual that by holding down the Control key and pressing the 1 key the list will be halted, and repeating the action will subsequently restart it.

In fact it stops screen output, and will work with any form of output to the screen — even graphics.

When you've found the section you seek the Break key may be employed as normal to return control to the keyboard.

Another more elegant solution is to type in the following line as a direct command:

POKE 622,255:GR. 0

This tells the Atari to rewrite its display list employing the fine scroll capability, and must be redone after each reset.

Not only does it slow the listing of programs to a much more readable speed, but it also looks very impressive. — Tony Barker, Australia.

**Trouble in that Cavern**

WHEN I run the Cavern Escape program from the May 1986 Atari User I keep getting Error at lines 5042 and 5500. Could you tell me why this is so? — T. H. Man, Nottingham.

***

I AM having trouble with Mike Rowe's Cavern Escape.

Twice I have programmed the game and twice I have got Error 8 at line 6245.

After 6½ hours of using the keyboard my patience was wearing a bit thin.

The game does run, but so far my son has only been able to find one key in Room 9.

Where have I gone wrong and do I have to retype the full program? — A. Bushy, Hull.

***

I TYPED in Cavern Escape from your May issue, and then CSAVED it on to cassette.

However when I ran the program the screen went blank as was stated, but if I didn’t press reset it would have stayed blank forever.

After having pressed reset and typing RUN all I get is Error 8 at line 5500.

I split line 5500 into four lines to find where the error was and it showed up a READ A.

As a newcomer to the Atari 800XL I am baffled by this and would be grateful if you could tell me where I have gone wrong.

I have checked my listing line for line and it is exactly as is printed in Atari User.

One more query I have is that after line 6000 there is a line starting:

5508 R=0

Should this be 8008 or is it a misprint? — Allan Byrnes, Buckfastleigh, S. Devon.

***

I AM having trouble getting Cavern Escape to work. I typed it in, corrected all errors using the checksum and sat back to enjoy the game.

The screen went blank after I typed in RUN as it's supposed to — the trouble is that all that happened.

I have checked the program checksum several times now, and I find there is an odd discrepancy. In the listing — page 20 — the following line appears between lines 6000 and 6010:

5508 R=0

I included this line in my typing, but whereas in your checksum the line is checked in the same order it is listed in my checksum it appears in its correct numeric place. Please could you explain this?

Finally one small point is that in line 1150 the second pair of hash marks is not very clear. Could you confirm that it is in fact a second set? — Nigel Edwards, Leighton Buzzard, Beds.

- The extra line 5508 creep in to the listing by mistake, and lots of people have pointed it out to us.

However it doesn’t make any difference — the program will run correctly with or without it — phew!

The three sets of characters in line 1190 are: two inverse hash symbols (###), then an inverse hash and an inverse dollar sign, and finally two more inverse hashes.

If you had used the checksum and got it wrong, the numbers would not have matched, so we can only assume that if you did use Get It Right! you must have typed in the listing correctly.

Anyway — the answer to all of your problems is — use the checksum. You don’t have any excuse now, as the full instructions have been reprinted on page 33.

**Antic chip playing up?**

UNFORTUNATELY all is not well with my 800XL. The graphic characters on certain commercial programs appear incorrectly.

For instance, on AtariSoft's Pole Position the tyres on the racing car begin flashing strange colours whenever other cars overtake.

On US Gold's Dropzone — an excellent shoot 'em up — the Defender-style radar screen corrupts a part of the screen reserved for smart bombs.

Also the scrolling sprite colours on the Hall of Fame do not work properly.

On English Software’s Elektroglide there appear to be three exits from the first tunnel when there should only be one.

I know these errors are not caused by faulty software or head-alignment problems with my data recorder because I have tried using a friend’s recorder to find the same errors, and they do not appear on his 800XL.

My theory is that there is a
hardware fault in the Atari's graphic chip which only affects certain software—the majority of programs. Do you advise sending my faulty machine to Atari or return it, yet again, to Dixons?
— Andy Barr, Chairman, Withernsea Computer Club.

* Yes it does sound rather like faulty hardware—probably the GTIA or ANTIC chips. You might consider returning the machine directly to Atari in the hope that the turnaround time may be a little better than via Dixons.

The only disadvantage is that you will have to pay the carriage costs to get it there.

** Elite for Atari **

COULD someone tell me where the Atari version of Acornsoft's Elite is?

There was an advert in January's magazine, but when I phoned them up they had ceased trading.

Also there is an updated De Re. Atari for XL/XE?— P. Myles, Woking, Surrey.

***

AS the only UK magazine dealing with the best home micro can you try and get to the bottom of the rumours about Elite for the Atari.

I wrote to Firebird just over two weeks ago, but have had no reply at all. Then in this month's C & VG I noticed a letter from a reader alleging that it has been smothered at birth by Acornsoft for being too good.

Just what is the truth?— Richard Daley, Poole, Dorset.

* A number of people have been writing to us asking about Elite on the Atari, and after a quick phone call to Firebird we can now set the record straight.

Firebird was planning an Atari version of Elite over a year ago, and early results looked impressive. Unfortunately the programmers working on the project split from Firebird, and plans were shelved.

A Firebird representative told us that the main problem was the lack of good 8 bit Atari programmers willing to take on the job.

He added that if any professional machine code programmers who are reading this would be interested in tecking such a major project, Firebird would be most eager to hear from them to talk terms.

In any event don't expect an Atari version of Elite to be in your local shops within the next few months.

** Designer dilemma **

I HAVE typed Player Designer into my 800XL, but cannot get it to work.

I have checked it line by line, but all that comes up on the screen is "Player Designer by Stephen Williamson, Please wait!"

Can you please help?

Also in line 540 is it PMBASE or PGMASE as my copy of the program is not very clear?— R.W. Holmes, Poyns.

* It's hard to say where the problem is from your description—the mistake could be almost anywhere.

Anyway, now that we've reprinted Get It Right! you can easily check typing mistakes yourself.

Line 540 says PMBASE, not PGMASE, so that may be where you've gone wrong.

** Text windows **

I OWN an 800XL and cassette, and have come across two problems.

Firstly how do you put a text window into Graphics 0?

Secondly, how do you do smooth scrolling in Gr.0 upwards?— A.R. Groves, Eastville, Bristol.

* A text window can be added to a Graphics 0 screen very easily by typing POKE 703.4.

This will enable you to scroll the bottom four lines without moving the other 20.

You must use PRINT #6 to print to the top portion though, just as you would any other type of screen with a text window.

To scroll text upwards requires more work, and there is no easy way to do this smoothly without some complicated machine code. Sorry.

** Intermittent fault **

I HAVE a six month old 800XL.

The problem is that while playing Cavern Escape the man suddenly went downwards on his own, but would not go upwards.

As I had already saved the game to tape I reset the computer and tried to type RUN. However the keyboard had locked-up. So I turned off the computer for five minutes, then turned it back on again. But I still got nothing from the keyboard.

I then turned it off again, and switched on while holding down Option. I then put all trays on, but this time all 48 boxes were green on RAM. Is my memory all right, or should I take it back to the shop?— Catherine Mason, Wigan, Lancs.

* It sounds as though you have an intermittent fault with your computer. As it is still under guarantee your best bet would be to take it back to the shop and ask them to either exchange it, or send it back to Atari for testing and repair.**
TWO FOR THE PRICE OF ONE

From RON SMITH

SOONER or later the Atari programmer needs to solve two problems - disabling the Break key and distracting the Attract Mode. Most solutions for the Break key problem suffer from the drawback of having to repeatedly execute code within the Basic program after each I/O operation or change of graphics mode.

Presented here is a once-and-for-all five-liner that solves the problem for most games and applications and throws in an answer to the Attract Mode problem for good measure. These should form the first five lines of your program for earliest protection.

The program uses just 24 bytes of machine code, tucked away at the top of page 6, leaving the rest clear for data or other routines.

The Atari displays a television screen once every 50th of a second, but has time between screens (the Vertical Blank) to leave a Basic program in order to carry out its own housekeeping.

Two user-patchable locations are provided during this time where the programmer may point the computer to a short machine code subroutine of his own. This routine uses the first of those opportunities, and sets up an immediate mode (as opposed to the second, deferred mode), Vertical Blank Interrupt (VBI) which resets IROEN, the Interrupt Request Enable byte at 53774 ($D20E) and ATRACT, the Attract Mode timer and flag at 77 ($4D).

The great advantage of this sledgehammer approach is that, once started, the routine is executed automatically 50 times a second, at no cost to the Basic program. The approach is XL compatible, BREAK vector notwithstanding.

The program is constructed as follows:

Line 10 is a belt-and-braces step, setting up IROEN and its shadow at 16 ($10) while the main routine is loading.

Line 20 sets up the Immediate Mode VBI and points the Operating System at our routine sitting at 1779, ($06F3).

Line 30 executes the VBI and our routine becomes operational within 1/50th second.

Line 40 contains the VBI initialisation and pointer data.

Line 50 contains the instructions which set IROEN to 112 and ATRACT to zero, plus the jump that takes us back into the operating system's tasks, before rejoining the Basic program.

```plaintext
10 POKE 15,112:POKE 53774,112
20 FOR K=1780 TO 1791:REGO 0:POKE N,A:
30 NEXT N
40 K=1584(1768)
50 DATA 104,102,6,160,243,169,6,37,97,
60 228,96
70 DATA 169,112,141,14,210,169,6,141,7
80 7,9,76,95,228
```

∧ Get it right!

```plaintext
18 5458 76 2735 30 2756
40 5168 50 4476
```

IF you'd like to have a go at writing some Five-liners of your own and we pay £25 for every one we print - then we'd like to hear from you.

Try to make them original, useful or entertaining. After we'd received the first couple of dozen programs to print your name on the screen, or play a musical scale, we began to get impatient for something more stimulating. Let's see you use your imagination!

Also, please remember that you're far more likely to get one published if you send us a neat listing, with good explanatory notes and a copy of the program on tape or disc. Our staff haven't got the time to decipher little scraps of paper or type in illegible listings. If we did, we'd never actually complete the magazine.

Send your Five-liners in to us at: Five-Liners, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Original, useful - or just plain fun!
VARIABLE NAME LISTER
From VERNON YULE

This is a very elegant Five-liner which will allow you to check all of the variables you have used in a program. Type the routine into the computer, and LIST it to tape or disc. Then when you want it simply ENTER it back in again over your program in memory.

After it has run, you will be prompted to 'Delete Utility (Y/N)'. If you type Y the routine will delete itself by using the Return Key mode.

The program is very easy to understand. The start of the Variable Name Table is found by PEEKing 130 and 131. The end of this table is found from 132 and 133. All of the variable names are stored between these two locations.

Each separate name ends with an inverse character, so anything over 127 is converted to a normal character (by subtracting 128) and a new line is then printed. A string variable has a $ sign after it, and an array has a ( The routine adds the extra RN for clarity.

Line 32767 gives the option to delete the utility, which is actually done in line 0 by printing the line numbers on the screen and using Return Key mode to enter them into memory.

NB: Make sure that your program does not use lines 0, or 32764 to 32767. Also, the variable Z is used by the routine, so that will always be added to the list.

MULTICOLOURED BACKGROUND
From STEVEN CROWE

We all know that the Atari has some amazing graphics facilities, but how about a multicoloured background on your Graphics 0 text screen? The effect can easily be achieved with DLIs and a touch of machine code. In fact, it's really a four-liner!

Line 10 modifies the Display List to cause a jump to our machine code after each line of text has been displayed.

Line 20 loads the machine code into the ever reliable Page 6! The address is given to ANTIc by setting locations 511 and 512, and the interrupt is enabled with POKE 54275,192.

Line 30 contains the data for the machine code routine.

Line 40 contains the data for the colours of each of the 24 lines. Each number is given by (Colour number * 16) + brightness. If you use values lower than 6, then try POKE 709,14 in line 10, or you might not be able to read your text!

To remove the display, either press the Reset button or enter a new GRAPHICS command.

32 COLUMN SCREEN EDITOR
From JASON GRANT

The text editor does not automatically adjust for a narrow playfield screen with its 32 column lines. Here is a short program which will adjust the editor to allow you to use a narrow screen, via an altered Display List. Unfortunately this method does not work for the wide screen option.

Line 10 sets the margins to display 32 characters, the maximum on a narrow screen. It then enters Mode 0 and sets DS to the current Display List address. DL is used as a counter to set up the new Display List in Page 6.

Line 20 puts 3 blank lines at the start of the display, then begins to write out the 24 modified lines.

Line 30 tells the computer where the next line of text data is located, and increments ready for the next one.

Line 40 then completes the...NEXT loop and sets the screen into narrow mode.

Line 50 tells ANTIc where the new Display List is located, and away it goes!

For...
This program uses graphics mode 8 to produce an 80 column text display which can be combined with mode 8 graphics to produce professional looking displays in your own programs.

Before running this program SAVE a copy to disc or tape. This is very important because the program will rewrite itself then delete a large part of itself. This is to save you a lot of hard work trying to type the control codes in the program correctly.

The program will read the data statements and then write new program lines containing the string definitions for the machine code routine and the character set data. These strings are almost unreadable, containing approximately 400 Escape and Control key characters.

After writing these lines, the program will delete all the data statements and most of the program elements involved in creating these strings, only leaving three lines not needed for the program. These are lines 1230, 1240 and 1250, and they should be deleted. They cannot be deleted by the program because they are required by the delete routine! If you do not SAVE a copy before running, and you have made any typing errors, you will have to start all over again.

When you first run this program the screen will go black and the data statements will be counted down on it. When the counter reaches zero the screen will return to the normal graphics 0 display and you will see the strings being printed out and the cursor move down over the screen text.

This is followed by a few screens of line numbers, which is the line deletion process taking place. When complete the program will return you to direct mode Basic with the familiar READY prompt. At this point the three lines mentioned earlier should be deleted.

Now SAVE the new program under a different filename to the original. It is this version of the program that you will use to produce your 80 column displays.

Some of you may be wondering how your Atari can start writing new parts of the program and deleting lines all by itself. This is because your Atari is brainier than the average computer.

Actually it is very easy to persuade your Atari to do the work for you – this can be achieved with one simple POKE. Using the POKE puts the computer into 'Return Key mode'. POkeing 842 with 13 puts the computer into screen input/output mode. POkeing 842 with 12 returns the computer to keyboard input mode.

This means that anything on the screen and below the cursor when this poke is performed will be treated as a direct mode command. Anything you require to be done is printed on the screen and the cursor is positioned above the commands. Then you POKE 842, 13: STOP.

You must also have a CONT statement after the last command you want executed, which will continue program execution at the next line after the STOP command. This next command should be POKE 842, 12. For an example of how to do this see line numbers 820 to 900.

The machine code routine is called by the USR function:

\[ Z = \text{USR}(A(	ext{ADR}, \text{PROG})), A(	ext{ADR}, \text{CHAR}) + X, Y, A(	ext{ADR}, \text{CHS}) \]  

The first parameter is the address of the string that contains the 80 column program and the second is the address of the string containing all the data for the redefinition of the character set.

The third parameter is the X coordinate of the starting position of

In order to show you how this routine works we have printed three demonstration programs. To use them you should first create your main program by following the instructions in the text.

After the working version has been created, delete lines 1230, 1240 and 1250 and SAVE it to disc or tape. This is your master program.

For each of the three demo programs type NEW and then type in the lines. You must now LIST – not SAVE – a copy to your tape or disc, and you may then checksum it if you desire.

To run them, first LOAD the master program, then ENTER the first demo to merge the two files. You could SAVE a copy of the merged program at this stage if you so desire. After you have RUN it you may ENTER the next demo, and after that the third.

Demo 1 shows an 80 column table of computer facts. Demo 2 shows what an adventure game might look like in 80 column, and Demo 3 shows graphics and 80 column text on a chart.
the line of text to be printed. It can have a value between 1 and 80, but it should be remembered that text can only be printed on the same line—that is, it will not continue on to the next line.

The fourth parameter is the Y coordinate of the starting position of the line of text to be printed. It can have a value between 1 and 185.

The fifth parameter is the address of the string that contains the line of text to be printed, in this case CHS.

The USR function is provided at line 200 in the program, although of course you may place a USR call wherever you desire one. The one in line 200 is set up to be used as a subroutine with the demonstrations provided.

Each line of text must be terminated by an @ because the machine code routine uses this character to determine when to finish printing.

The normal keyboard characters can be obtained, and in addition a pound sign # can be obtained by using Control-fullstop.

Normal 40 column characters are drawn on an 8 x 8 matrix, for instance the letter a is drawn as follows:

<table>
<thead>
<tr>
<th>Character</th>
<th>Binary</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>a</code></td>
<td>000000</td>
<td>0</td>
</tr>
<tr>
<td><code>b</code></td>
<td>000001</td>
<td>1</td>
</tr>
<tr>
<td><code>c</code></td>
<td>000010</td>
<td>2</td>
</tr>
<tr>
<td><code>d</code></td>
<td>000011</td>
<td>3</td>
</tr>
<tr>
<td><code>e</code></td>
<td>000100</td>
<td>4</td>
</tr>
<tr>
<td><code>f</code></td>
<td>000101</td>
<td>5</td>
</tr>
<tr>
<td><code>g</code></td>
<td>000110</td>
<td>6</td>
</tr>
<tr>
<td><code>h</code></td>
<td>000111</td>
<td>7</td>
</tr>
<tr>
<td><code>i</code></td>
<td>001000</td>
<td>8</td>
</tr>
<tr>
<td><code>j</code></td>
<td>001001</td>
<td>9</td>
</tr>
<tr>
<td><code>k</code></td>
<td>001010</td>
<td>10</td>
</tr>
<tr>
<td><code>l</code></td>
<td>001011</td>
<td>11</td>
</tr>
<tr>
<td><code>m</code></td>
<td>001100</td>
<td>12</td>
</tr>
<tr>
<td><code>n</code></td>
<td>001101</td>
<td>13</td>
</tr>
<tr>
<td><code>o</code></td>
<td>001110</td>
<td>14</td>
</tr>
<tr>
<td><code>p</code></td>
<td>001111</td>
<td>15</td>
</tr>
</tbody>
</table>

As we are using 80 characters per line each character can only be half as wide, that is it is a 4 x 8 matrix.

Therefore the character data is stored in pairs of characters. For example, B and C are stored as shown below:

<table>
<thead>
<tr>
<th>Character</th>
<th>Binary</th>
<th>Decimal</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>B</code></td>
<td>000000</td>
<td>0</td>
</tr>
<tr>
<td><code>C</code></td>
<td>000001</td>
<td>1</td>
</tr>
<tr>
<td><code>D</code></td>
<td>000010</td>
<td>2</td>
</tr>
<tr>
<td><code>E</code></td>
<td>000011</td>
<td>3</td>
</tr>
<tr>
<td><code>F</code></td>
<td>000100</td>
<td>4</td>
</tr>
<tr>
<td><code>G</code></td>
<td>000101</td>
<td>5</td>
</tr>
<tr>
<td><code>H</code></td>
<td>000110</td>
<td>6</td>
</tr>
<tr>
<td><code>I</code></td>
<td>000111</td>
<td>7</td>
</tr>
<tr>
<td><code>J</code></td>
<td>001000</td>
<td>8</td>
</tr>
<tr>
<td><code>K</code></td>
<td>001001</td>
<td>9</td>
</tr>
<tr>
<td><code>L</code></td>
<td>001010</td>
<td>10</td>
</tr>
<tr>
<td><code>M</code></td>
<td>001011</td>
<td>11</td>
</tr>
<tr>
<td><code>N</code></td>
<td>001100</td>
<td>12</td>
</tr>
<tr>
<td><code>O</code></td>
<td>001101</td>
<td>13</td>
</tr>
<tr>
<td><code>P</code></td>
<td>001110</td>
<td>14</td>
</tr>
<tr>
<td><code>Q</code></td>
<td>001111</td>
<td>15</td>
</tr>
</tbody>
</table>

**VARIABLES**

- **CHAR**: Holds character set data.
- **CHS**: Holds text to be printed.
- **PROGS**: Holds machine code routine.
- **NUM**: Counter for data statements.
- **ID**: For Next counter.
- **N**: Read variable.
- **X**: Dummy variable for USR function.
- **Z**: X coordinate.
- **Y**: Y coordinate.
- **A**: Offset for line delete routine For-Next.

---

**Main program**

```
160 DIM CHAR$(40), CHS$(01), PROGS$(24)
110 GRAPHICS 1: NUM=577
120 POSITION 2,2: HS="PLEASE WAIT WHILE DATA IS READ IN."
130 RESTORE 2340: FOR I=1 TO 80: READ M: NUM=NUM+1: POSITION 3,9: HS=":
150 "CHAR$(I)=CHS$(M):"
160 NEXT I
170 RESTORE 2340: FOR I=1 TO 256: READ M: NUM=NUM+1: POSITION 3,9: HS=":"
180 "PROGS$(I)=CHR$(M):"
190 GOSUB 2000: GRAPHICS 16: SETCOLOR 1,1,12: SETCOLOR 2,0,8: SETCOLOR 4,9,4:
200 GOTO 2200
200 2200: EVENTS=EVENT$(0), ORA CHAR$(X), Y, AD RICH?
210 RETURN
220 REM CHAR$(CHAR$), ORA CHAR$(X), Y, AD RICH?
220 RETURN
```

---

August 1986 ATARI USER 43
I looked back, and I guess they didn’t ring the doorbell after all. Do you still want to find the doorbell?"

2410  154546.1529="YES"
2410  154547.1701="The bell rings. A minute later, a stooped man opens the door and beckons you in."
2440  154570.1672="enter."
2450  154570.1703="em.
2550  154570.0020="FOR I=1 TO 1000 STEP 80"
2470  154570.7658="rens."
2480  154570.1190="NEXT I"
2490  154570.0020="END"
2500  154570.0020="REM"
2510  154570.0020="REM"
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November issue: Computer program, Bittware operator utility, ST graphics examples, ST software list, Guy Fawkes games, 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, Superexpert review, Check sums for early games, Book reviews, Adventuring, Software reviews, PLUS Atari ST User: K Spread review, Jeff Marker and Colour space, Music Pt. 1, Making the most of the ST.

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


June issue: Cavern Escape maze editor, Part 1 of Great Little Gadget, build a light sensor, Final part of Basic Compiler series, Five Liners No. 1, Player Missile Graphics Pt. 2, Adventuring, Software reviews, American Scenic, PLUS Atari ST User: Conclusion of ST Art series, type-in 3D maze game in Basic, Two 1-meg upgrades. Software reviews, Making the most of the ST, and all the latest ST news.

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<tr>
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<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>£200</td>
<td>From £10</td>
</tr>
<tr>
<td>£500</td>
<td>From £16</td>
</tr>
<tr>
<td>£1,000</td>
<td>From £35</td>
</tr>
</tbody>
</table>

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