ATARI USER

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C on the ST

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Vol 1 No 9 January 1986

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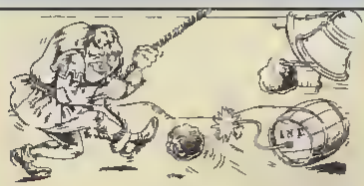

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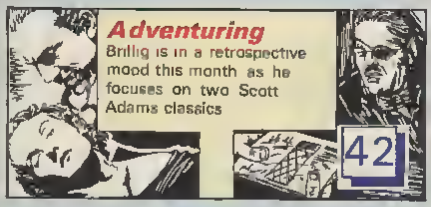

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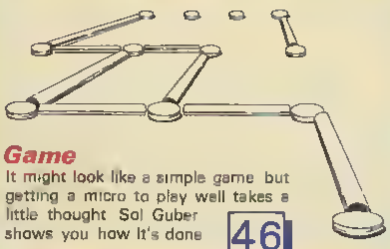

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FREEBIE
This month's Freebie for Atari User disc and tape purchasers is Scramble Fighter. You'll need a clear eye and a steady hand or you'll never escape

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Here's a

IBM, Epson QX-1

Acorn Electron, ACT

Ericsson...and t

that fits them all–the

At last, your computer can have an Epson printer.

Even if it's only supposed to be compatible with own brand printers (like Atari)

Our latest printer the GX 80, has a revolutionary new interface called PIC (it means Printer Interface Cartridge and that's it on the right) The cartridge slips into the back of the GX-80 and enables the GX to understand commands from the host computer

So if you've ever wanted to have an Epson printer for your micro but thought you couldn't here it is

But first read about the GX 80's other cracking advantages

What happens when I change computers?

Gone are the days when you had to scrap a perfectly good printer just because it didn't go with' your new computer

Once bought, your GX 80 stays put (Epsons tend to stick around for ages anyway, now we've taken tradition a little further)

When the time comes to upgrade your computer you simply go back to your Epson dealer and buy the corresponding new PIC

It's a far sight cheaper than being forced to sell/scrap out your printer only to buy another one And in effect it makes the GX 80 your printer for life

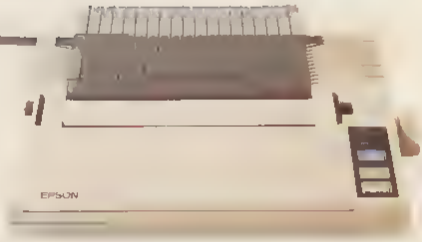
s a plug for any Atari,

-16, Apple IIc, BBC,

T Sirius/Apricot, Compaq,

this is the printer

e new Epson GX-80.



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I'm looking for a permanent relationship too. Tell me the rest about the GX-80 with PIC.

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VISA

Access

Software demand booming

A MAJOR mail order company says there is both good and bad news in Atari's decision to sell its entire 800XL stock to Dixons.

The bad news – according to Steven Burke of Compumart – is that smaller firms will not be able to compete with the half price machines all 100,000 of them Dixons have to offer

The good news The long term effect will be that with so many more Atari computers in UK households there will be a tremendous demand for software and peripherals

In response to the machine's lower price Compumart is slashing the cost of some of its stock It has dropped the price of the Atari 1027 letter quality printer by £100 to £145 and bundled in a free Atari Writer word processor

The company is also offering the Atari 1050 disc drive and box of 10 blank discs for £129 95 Similar boxes of 10 discs will cost under £10

"And Compumart is already drawing up plans for other money-saving deals on Atari hardware" said Burke

Acorn's Hall joins Atari

ATARI has recruited the former national sales manager of Acorn to strengthen its marketing operation

Chris Hall 39 and married with two children will now become responsible for sales to dealers and distributors in the UK and Ireland

He brings a wealth of experience to the job says Max Bambridge Atari UK's general manager

This is of great importance at a time when Atari is consolidating its position as the market leader

Rob Harding Atari UK's sales manager is to continue looking after multiple accounts and the mail order business

ST owners to get big three free

THERE was good news for existing and future Atari ST owners at the Comdex Fall show in Las Vegas

ST buyers will now get three free programs – ST Writer a powerful word processor compatible with Atariwriter from Atari's eight bit computer line Neochrome a preview version of their colour art program and Doodle a monochrome sketching program

Not mentioned officially by Atari but certainly one of the stars of the show was a demonstration disc they were giving away showing a full colour waterfall with water flowing and splashing plus a montage of new hi-res pictures with a routine that would make a bird fly across the screen so realistically that you would think it was a movie film

Atari consider them a great selling aid so it will probably be only a few days before they are available in British computer stores

Big launch for Atari was a 20 mbyte hard disc system which will retail at $800

They arrived on the second day of the show and most of the software companies on the stand were using them within minutes and enjoyed four days of error free high speed hard disc usage

The price of these units is a real breakthrough and although they wouldn't give out a UK price at £800 or less for a 20 mbyte hard disc coupled with the ST you end up with a highly sophisticated system for less than the scheduled price of the Commodore Amiga

Okidata was showing its low cost colour printer which can print out the hi-res colour graphic screens

One item surprisingly missing was a laser printer

Michtron one of the larger software producers said they were working on interfacing an Apple laser printer made by Canon to the ST

Atari themselves would say nothing apart from the fact that when they brought one out it would be cheaper and better

Star of the show in professional software even in its not quite finished state was with

By JOHN SYMES
Managing Director
Microdeal Ltd

out doubt The Professional a lookalike spreadsheet to the best selling Lotus 1 2 3

It is produced by VIP Systems a highly respected company and previous producers of an integrated suite of programs for the Tandy colour computer

This and any future releases from VIP promise to be of a quality not previously known for computers costing less than £1 000

A proliferation of other professional software is starting to establish the ST as a best buy

Databases come from the British company Kuma also from Atari spelling checkers from Haba Hippo and Regent word processors from Atari GST Regent and Kuma plus many communication programs

Typesetter gives you electronic page design and Haba Wills helps you write your own will if you think your computing days are numbered

Tipped to be a mega seller is Michtron's Time Bandit This conversion from last Christmas's No 1 hit for the Dragon in the UK uses the ST's capabilities to the full

The adventure hit of Comdex was without doubt Kings Quest from Sierra a 3D graphic adventure with hundreds of screens and dozens of animated characters that walk talk run climb even swim

If you're into art design then Degas from Batteries Included of Canada will probably set the standard for graphic design programs

OFFICIAL BACKING FOR ATARI USER SHOW

ATARI has given its official backing to the first ever Atari User Show for the United Kingdom.

It is to be held in the Champagne Suite of the Novotel, Hammersmith, London, from March 7 to 9

The event will be organised by Database Publications, publishers of *Atari User* magazine and already well established in the field of computer exhibitions

'Due to our increasing presence in the marketplace, we feel that it has become necessary to have an official showcase", says Rob Harding, Atari UK's sales and marketing boss

It will provide our ever-growing army of users with the opportunity to meet all the producers of peripherals and software first hand

And obviously there will be an exciting range of new products on display at the show'

Will Atari itself be launching anything new?

'People will just have to wait and see', says Rob Harding, 'but you can be certain we aren't be letting an event of this importance slip by without something significant happening

Releases escape copyright rumpus

DIGITAL Integration has released Fighter Pilot, a jet plane flight simulation for any 48k Atari

It offers panoramic 3D cockpit views, 3D air-to-air combat, sound and crash sequences, and costs £9 95 on cassette and £12 95 on disc

AN out-of-court settlement between Apple and Digital Research over alleged copyright infringements by Gem does not involve the latest two programs in the range for the Atari ST

For the impending new releases – Wordchart and Graph – do not simulate the Macintosh which was at the centre of the original row

Apple has no quarrel with us over the format of these two Digital Research's Paul Bailey told *Atari User*

Though Digital Research refused to concede it had violated Apple's copyright in any way the company recently handed over an undisclosed sum as part of the settlement.

It also agreed to produce new versions of Gem designed to be substantially different to the Macintosh in both screen appearance and operation

At the same time Apple was given the right to vet all changes

But these new releases do not fall into that category said Paul Bailey

The two combine with the other Gem products to form a complete business graphics presentation tool All that is missing is the page layout facility which we hope to supply soon , said Bailey

Wordchart is a special word processor designed for producing text based slides or foils

Graph is a general purpose graphics tool which enables the user at the touch of a button to produce a variety of formats – bar stacks 3D map and symbol diagrams and charts

They are due to be released in the first half of this year

DATABASE WITH GEM

A DATABASE for the 520ST has been developed by Laser Software

Laserbase ST which uses Digital Research's Gem operating system handles a range of information needs from order processing through time management and costing to customer records and sales tracking

Said marketing manager Nigel Parry The Gem environment is ideal for our concept of a powerful database facility that is easy to use extremely powerful and yet not over priced

The cost is £99

HILDERBAY TAKEN OVER

THE Hilderbay range of business software has been acquired by a new company Centratime and will be made available for Atari ST computers

Despite the popularity of its products over the past six years Hilderbay had run into difficulties which culminated in it going into voluntary liquidation

Now Centratime has bought the rights to Hilderbay's Payroll Invoicer Bookkeeper and Statutory Sick Pay packages

260ST on schedule

THE Atari 260ST is on schedule for a launch early this year, according to sales and marketing manager Rob Harding

He told *Atari User* the machine would come in two versions, one with a built-in disc drive and one without

It will have a built-in RS modulator enabling it to connect to a television set.

Action spans centuries

MEDIATOR the latest arcade game from English Software for any 48k Atari combines medieval and futuristic themes

Encountering mountain robots killer trees skeletal horses and green slime creatures the player's role is to search for the good Mediator It costs £8 95 on cassette £12 95 on disc

Mid-price sector

TWO Atari programs have been released in Ariolsoft's new mid-price series Axis Assassin and D Bug

In Axis Assassin the player faces a swarming army of mindless killers single handed The game features 100 increasingly difficult battles kamikaze hunters relentless web spinners robot drones spores which double into mutant guards and Xterminators

D Bug is a computer game featuring a computer game called Gotcha

The computer breaks down during the game and it is up to the player to find the fault and repair it.

Price of both games is £7 95 on cassette £9 95 on disc

Ariolsoft has also released another game a conversion for the Atari

Realm of Impossibility is a dungeon drama in which the player faces attacks from snakes giant spiders zombies and hordes of other nasties

It has four skill levels 13 dungeons 129 different rooms two player mode and costs £12 95

Galactic battle

SPEED power and points are the three goals in Ballblazer a new game for the Atari 800 XL and XE by Lucasfilm Games

Distributed by Activision the game is set in the year 3097 The player is the first Terran to have battled through qualifying rounds to compete for the honour of his planet In the Interstellar Ballblazer Championship

Two players can compete against each other or a player can take on one of nine practice Droid players each with a differing level of skill

The screen is split so each player gets a view of the game through the windows of his own rotofoil The Plasmorb – ball – is then fired on to the grid for the opponents to try and capture and score

Ballblazer £9 99 on cassette and £14 99 on disc comes on the heels of Rescue on Fractalus And Activision has two more Lucasfilm Games in the pipeline – Koronis Rift and Eidolon action strategy and fantasy action games

Schools net for 520 ST

THERE has been a warm welcome from Atari for the networking facility developed by Software Punch which is expected to give the 520ST a real boost in the educational market

Atari sales and marketing manager Rob Harding said "It is a very good product – streets ahead of others available to the education sector

Called SimpleNet it will cost about £120 and is being talked about in the industry as a successor to the Acorn Econet

Software Punch managing director Noel Runnels-Moss says "Econet is an absolute pig and seven to eight years old

He added that his firm was already receiving inquiries from a number of educational authorities who were thinking about buying the 520ST in large quantities

SimpleNet uses RS232 cables runs under Gem is icon driven and offers electronic mail and word processing facilities

The teacher can look at any screen without the pupil being aware of being observed

68000 ASSEMBLER

THE K Seka 68000 assembler for the Atari 520ST has been released by Kuma Computers

A native code assembler using standard Motorola mnemonics it produces either absolute or relocatable code at a rate of 30 000 lines a minute even for large files says Kuma

Main features include text editor full 68000 assembler symbolic debugger line disassembler built in linker conditional assembly macro facility formatted listing output and absolute relocatable or linkable code Price £49 95

UK EXPORT

NEW on the American market for the Atari 520ST is Star Glider an arcade strategy game produced by British Telecom software house Rainbird in the UK.

Reward offered to trap pirates

ANGERED by the extent to which pirates are infiltrating the Atari scene the boss of utility specialist Computer Support is leading a campaign to bring the offenders to book

Having discovered that at least two of his own products are being illegally copied John Lawson s offering £100 reward for information leading to the successful prosecution of the person or persons responsible

One of the Computer Support products involved is Ultimon a built in machine code monitor capable of stopping any program on the fly which sells for £49 95

The other is 80 Column Pack a built in 80 column text mode that works on an ordinary TV set is compatible with most software and costs £69 95

Lawson told *Atari User* that he has been informed that both have been pirated and are available on the black market for about £20 each

This is only the tip of the iceberg he said Other companies supplying Atari hardware and software are getting ripped off far more than me

But I m determined to take a stand against the pirates If they can be identified I will proceed with court action to hit them with the heavy penalties incorporated in the new copyright legislation – even if I have to bring the prosecution myself

Leading anti-pirate campaigner Ken Ward of the Norwich User Group applauded Lawson s decision to go after the pirates and promised the help of his contacts in the Atari fraternity

He said One thing that puzzles me is how they can afford to copy chips and printed circuits and still make money

Pirating hardware is a very expensive business – I can t see that these people are making very much money out of it

But Lawson feels he has the answer to the economics of such activities Eprom burners are available to the general public for £60 or less and once the pirate has the necessary equipment he can produce copies quite cheaply

He believes the pirate activities involving his products are centered in the North West of England

I received two reports about the availability of copies of Ultimon and 80 Column Pack and both came from this area he said

One was from a dealer who handles Computer Support products and the other came from a young Atari user Both live in the Manchester area

In addition I have heard two names on the grapevine – George of Blackpool and Rob C of Manchester – who are said to be involved in piracy of Atari-related products

This would seem to confirm that the North West is where this activity is going on and it s now up to honest Atari users to help me track down the person or persons responsible

I can promise you I intend to make it very hot for them indeed once they are identified

TWO FIRSTS FOR THE ST

ATARI has announced two more firsts for the 520ST a Modula-2 compiler and a full p-System with choice of UCSD Pascal and Fortran 77 compilers Both are from TDI Software

The compiler is a software development system which uses the Modula 2 language a development of Pascal

It is claimed to provide many useful extensions which help it produce fast 32 bit native code

These include a full feature program editor a multi-pass Modula-2 compiler module linker and library facilities and full interface to a large number of Gem functions

The interface not only allows Gem applications in Modula-2 but also full access to graphics mice windows and pop up menus

Although a high level language TDI claims it is both simple enough for beginners and powerful enough for serious programmers

The p-System facilities include a screen editor file manager disc recovery tools printing utilities library manager and other operating system services

Available as add ons are three separate p-System languages – UCSD Pascal Fortran 77 and Basic

The syntax of UCSD Pascal differs from standard Pascal its major extensions being its string handling capabilities and memory management facilities

Price for both Modula 2 compiler and p System is £195

BOS CHOSEN

BUSINESS Operating Software has been chosen by Atari to help with its push into the business market

Managing director Alistair Jacks said BOS s operating system software opens up a wide range of business applications packages for the Atari including its own suites of accounting office and vertical software

MicroLink
in association with
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No. 5 January 1986

NEWSLETTER

Now it's e-mail with flowers

NOW MicroLink subscribers can say it with flowers at whatever hour of the day or night the mood strikes them, and their floral gift will be delivered anywhere in the British Isles.

MicroLink has joined forces with the world famous flower delivery service Interflora to create FloraLink which for the first time ever enables people to send flowers and plants by way of their computer

FloraLink will have 24 hours a-day open access and deliveries by Interflora's 2,700 members throughout the UK and Eire can usually be made any day other than Sunday

Orders sent to FloraLink before noon on a working day can be processed and delivered the same day

The selection includes freshly cut flowers, bouquets, wreaths and sprays and potted plants – all manner of sizes and specially shaped arrangements to suit the customer's pocket.

FloraLink will carry a price list to give subscribers an idea of just what is available and payment for the flowers will be by credit card

Eventually it is hoped to expand FloraLink to cover all Interflora's 44,000 members in more than 130 countries

THE MicroLink family is getting bigger and bigger and New Zealand can now be reached directly through MicroLink

Subscribers can communicate with them just as easily as they can with other users in the UK

All that's needed is the system code number – like MicroLink's 72 – of the person in Eire or New Zealand to be put in front of their ID number

Fourteen countries are now part of the international electronic mail network – Australia, Canada, Denmark, Eire, Germany, Hong Kong, Israel, Korea, the Netherlands, New Zealand, Puerto Rico, Singapore, UK and USA

Find out more about what MicroLink offers by sending a stamped addressed envelope to:

Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

Link to a train

WITH the aid of MicroLink an historic German built steam locomotive has been saved from the scrap heap and brought to Britain to feature in a permanent display of railway nostalgia

Steam enthusiast Martin O Keeffe used MicroLink's telex facility to negotiate a deal with Kolmex, a Polish import export firm specialising in the sale of railway equipment.

What he was after was a narrow gauge loco that had been retired from its job of hauling sugar beet from the fields to a processing factory

It had been built in 1918 by the firm of Henschel at Kassel in Germany for use by the German army on railway networks built by military engineers to supply the front lines in the 1914-18 war O'Keeffe's research showed that the loco had been used by the Polish factory since 1937

It is now the property of the North Gloucestershire Narrow Gauge Company a small group of enthusiasts to which O Keeffe belongs.

When it is eventually restored to mint condition the engine will be one of the feature attractions of the museum railway at Toddington in Gloucestershire.

There are a number of locomotives on display and O'Keeffe and his fellow train buffs operate them on open days during the summer

Motivation for youngsters

CHILDREN with learning difficulties and disabilities are being taught with the aid of MicroLink

The 76 pupils at Kaimes School in Edinburgh all have special needs in the educational sense – but that doesn't mean they miss out on information technology

Micros have been in use at the school for several years and apart from their value as teaching aids, are extremely popular with all age groups says headteacher Jennifer Ruddick

The primary age youngsters use the computers to help them learn simple maths and spelling, while children at the secondary level are taught the practical uses of micros and even some programming theory

The school is a Prestel subscriber which gives the youngsters access to a massive information database which is complemented by MicroLink's electronic mail services computer industry news, UK bulletin boards list and telesoftware

Asked if micros have advantages over more traditional methods of teaching children with learning difficulties, Miss Ruddick said "Absolutely, although we naturally have a low ratio of teachers to pupils because of the children's special needs our youngsters are much more motivated to learn through the use of micros than by blackboard, pen and paper"

The school uses a number of special programs, including the micro special pack from the Scottish MEP in Glasgow which helps learners of low ability to grasp the basics of the three Rs as well as preparing them for life after their schooldays.

"But we are just as interested in seeing what computers can do as in getting information from them", says Miss Ruddick 'We will use MicroLink's special features to help our pupils learn even more about practical applications of information technology'

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Versatile SuperScript SuperScript combines word processor spelling checker calculator and mail merge facility all in one package SuperScript gives you all the tools you need to produce high quality reports tables lists personalised letters and prints labels quickly and efficiently

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Good with numbers SuperScript allows you to extend your editing to include full columns of decimal documents like financial statements and with decimal tabs to create fully justified tables of numbers. Powerful built-in calculator functions can be used interactively on columns of numbers from the text of your document. Apart from the usual mathematical functions like add, subtract, multiply divide, and percentages you have the ability to add rows, columns or even whole tables

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Powerful for the experienced user SuperScript also gives you the ability to set up your own commands to a minimum by storing your own command sequences or frequently used strings. This means that with a single keystroke you can enter frequently used phrases or multi-line addresses from a glossary. Load in documents or formats or execute a pre-programmed sequence of operations

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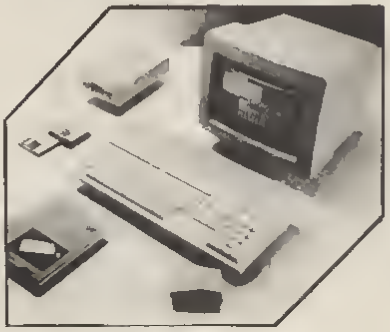

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Anatomy of an arcade game

STEPHEN WILLIAMSON begins a series on the art of producing your own machine code games by presenting a shoot 'em up arcade epic which he will be dissecting in future issues

A FEW years ago I attended a party. There were the usual goings on – people getting drunk, loud music, the sound of breaking glasses.

I wandered into one room at the back of the house and instead of people gossiping I found a small crowd huddled round a black and white TV which showed a picture of two thick lines moving up and down the screen with a square thing bouncing around between them.

At first in my intoxicated state I thought that I was witnessing some new bizarre late night cult TV programme but then realised that I was present at the dawn of a new era in microchip technology – the video game had arrived!

So I bought my own video game console and played tennis and squash until the early hours of the morning. Later when all the pubs and arcades had replaced their first generation tennis games with the more sophisticated Space Invaders I acquired an Atari games machine and became a compulsive alien zapper. I had no clue about programming leaving such esoteric things to the experts.

Then the price of micros fell and for £189.95 I was one of the first to buy a Commodore Vic after waiting the then customary five months for delivery. To my surprise I found that programming was not all that difficult and soon became fairly proficient in Basic.

After typing lots of arcade style games listings from magazines I began to design my own games. Unfortunately many of my efforts were spoilt by flickery jerky animation due to the main limitation of Basic – it's too slow for fast arcade games.

So I decided to take the plunge and learn machine code. Many people hold their hands up in horror at its mention believing it to be incredibly difficult and complex.

Well machine code is certainly more tricky to work with than Basic. There are no friendly error messages to tell you when things go wrong and often routines just stop with the Atari not revealing at what point the program has stopped or why. Debugging can become a problem.

However what I hope to show in this series is that given a bit of organisation and patience machine code programming need not be all that difficult and even with only a rudimentary knowledge of the language you can create fairly sophisticated arcade games.

I have written a fast and furious shoot 'em up arcade game Alien Attack which I shall use to illustrate machine code. The techniques and procedures can be copied and used in your own arcade games.

Alien Attack will work on all Ataris except 16k ones and of course the ST which does not use the 6502 chip.

Atari makes life easier for the games programmer by the use of the player missile or sprite system and

Alien Attack makes extensive use of it A working knowledge of the player missile system together with familiarity with the principles of assembly language programming will help in examining the construction of the program

To make things simple I have used only a selection of the available assembly language mnemonics and I have avoided hex altogether

Even if you do not follow the intricacies of how Alien Attack was written you will still have an entertaining and challenging game

In machine code as in Basic there are no firm and fixed rules about what s the correct way to program Ask 100 programmers to produce a Pacman clone and each will approach the task in a different way

But if the program works if Pacman gobbles his way around the maze and the ghosts duly chase him then the program does what it is supposed to do and is essentially correct

The routines presented in these articles are one way of tackling the creation of an arcade game There are other ways to achieve the same effect Creative programming consists of experimenting with the language and finding a style that suits you

Below is a complete listing of the Alien Attack game A Basic loader POKES the machine code data into RAM and produces a title screen By playing the game you will become familiar with the type of routines that need to be used in arcade games – animation collision detection sound effects and so on

Meanwhile if you can score more than 50 In Alien Attack consider yourself a first class alien zapper!

In the next articles in this series an assembly language version of the machine code routines will be published together with a detailed analysis of each routine

20 Lowers RAMTOP to page 100 freeing memory from 25600 to the start of Basic ROM (address 40959) for machine code programs Alien Attack needs nothing like this amount of free RAM but it does no harm to lower RAMTOP by more than is actually required

30 Machine code data is POKEd into memory starting at address 38916

40 Checksum routine to make sure that the correct data has been loaded If not an error message is displayed and you must check that you have typed in the correct data

60,70 Display a flashing title in Graphics Mode 2 Location 53279 is checked to see whether the Start key has been pressed A value of 6 in address 53279 indicates that the key has been pressed and the program continues

80 Puts the Atari into Graphics Mode 0 and POKE 755 0 switches off the cursor

90 Sets the screen to black clears the sound registers and then switches off the screen display by POKE 559 0

100 Puts a random pattern of dots on the screen to simulate a star background By switching off the screen display at line 90 processing is speeded up by approximately 30 per cent so that the delay while the pattern is calculated is cut to a minimum

120 Sends the program to the machine code routine At the end of the game the program returns to Basic and line 130 makes sure that all the players and missiles are off the screen

150 Calculates the final score by peeking into the score registers (1547 to 1549) and converts them to a decimal number

170 Again waits for the Start key to be pressed to initiate another game but returns to line 160 if not pressed to display a flashing title This takes care of the short Basic part of the program

190 Onwards contains the data statements that hold the machine code routines used

```
10 REM *** ALIEN ATTACK ***
20 POKE 106,100 GRAPHICS 2+POKE 708,0:
SETCOLOR 2,0,0 TRAP 0
30 ? "Data loading     ";FOR N=0 TO 147
2:READ A CHKSM CHKSM+A,A NEXT N
40 IF TRAP(1366 THEN ? "DATA ERROR I
N";STOP
50 ? "K       by Stephen Mills"+"
" "          PRESS START",
60 POSITION 3,5 ? #6;"ALIEN ATTACK", F
OR N=0 TO 20 NEXT N
70 IF PEEK(53279)<>6 THEN POSITION 3 5
:? #6;"Alien attack", FOR N=0 TO 20 NE
XT N GOTO 60
80 GRAPHICS 0:POKE 755,0
90 SETCOLOR 2,0,0 ? "K" SOUND 0,0,0,0:
POKE 559,0
100 FOR N=1 TO 480 POKE 24640+INT(RND(
1)*960),14 NEXT N POKE 755,0
110 POKE 24645,16 POKE 24666,16:POKE 2
4660,50 POKE 24661,96 POKE 24662,96 PO
KE 24663,50
120 A=USR(38916)
130 FOR N=53248 TO 53250:POKE N,0:NEXT
 N:GRAPHICS 2 SETCOLOR 2,0,0:POKE 755,
0
140 ? "       PRESS START TO PLAY AGAIN
"
150 SCORE=100*(PEEK(1547)-16)+10*(PEEK
(1548)-16)+PEEK(1549)-16
160 POSITION 5,5 ? #6;"GAME OVER" POSI
TION 5 7:? #6 "SCORE" SCORE
170 IF PEEK(53279)<>6 THEN FOR N=1 TO
20 NEXT N:POSITION 5,5 ? #6;"game over
";:FOR N=1 TO 20 NEXT N GOTO 160
180 END 0
190 DATA 169 85,141 12,208,169,146,141
,7,212,169,3 141,29 208 169 62,141,47,
2
200 DATA 169,16,141,11,6,141,12,6,141,
13,6,169,5,141,29,6 169,158,133,204
210 DATA 169,100,133,203,169,154,169,0,133
,202 133,216 134,134,234,234,234,234,2
34 234 169
220 DATA 0,162,9,157,1,208,157,0,6,202
,208,247,133 220,133,219,160,0,169,0
230 DATA 153,0,147,167,0,169,153,0,149
,153,0,150,169,2,162,208,208 238,169,2
39
240 DATA 141,192,2,169,98,141,193,2,16
9,25 141,196,2,169,122,141,193,2,169,1
200 DATA 141,18,208,173 31,208,201,7,2
48,7,96,169,0,133,77,32,179,162,32,152
250 DATA 154 32,47,153,32,173,167,32,1
5 154 32,169 151,32 2,165,32,167,154,3
2
270 DATA 208,155,76,127,162,160,20,162
 100,202,202,253,136,208 248,160,204,1
64,205,173
```

```
200 DATA 129,2,201,11,202,5,224,56,240
,1,202,201,7,208,5,224,198,208,1,232
208 DATA 201,14,208,5,192,20,240,1,136
,201,17,208,5,192,269,240,1,200,134,24
4
100 DATA 132,205,142,8,208,169,24,157,
8,148,152,1,148,152,1,148,153,12,148,1
53
110 DATA 11,148,169,0,163,2,148,151,25
5,147,153,17,148,169,68,153,4,148,153,
14
120 DATA 148,151,5,148,153,16,148,169,
66,153,6,148,153,16,148,169,169,151,7,
148
130 DATA 151,5,148,169,196,151,8,148,1
69,219,153,16,148,169,129,153,11,148,9
8,121
140 DATA 191,2,201,53,208,1,96,166,208
,164,207,169,221,153,8,149,169,165,153
,254
150 DATA 168,169,102,153,3,149,153,4,1
49,169,66,153,5,149,153,14,149,169,16,
153
160 DATA 5,149,151,8,149,153,12,149,16
9,48,153,7,149,152,8,149,169,24,153,9
170 DATA 169,153,16,149,153,12,119,169
,16,153,11,149,169,8,157,764,148,151,1
5,169
180 DATA 165,20,10,126,1,200,224,196,2
08,4,169,8,133,208,234,58,208,4,169,1
190 DATA 133,208,168,208,201,8,208,2,2
02,202,232,192,248,208,2,168,8,162,1,2
08
200 DATA 134,286,132,267,96,121,194,1,
201,51,208,1,96,166,205,164,218,169,12
8,151
210 DATA 8,168,151,1,168,157,16,168,16
9,216,151,2,156,153,4,158,157,6,188,15
1
220 DATA 8,158,153,10,158,153,12,158,1
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230 DATA 9,188,163,12,158,169,146,163,
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5,26
240 DATA 74,176,1,288,224,196,208,6,16
9,8,137,211,224,89,208,4,169,1,133,211
250 DATA 165,211,201,8,208,2,283,882,1
32,192,240,200,2,188,8,142,2,208,124,1
69
260 DATA 132,118,96,173,195,2,201,53,2
08,1,96,168,224,184,228,189,229,153,8,
151
270 DATA 169,88,153,1,151,153,16,151,1
69,188,153,1,151,165,128,153,1,151,169
,98
280 DATA 153,4,151,169,58,157,5,151,15
3,5,151,169,24,153,7,151,153,8,151,169
290 DATA 28,153,9,151,153,12,151,169,8
,163,265,158,163,22,151,185,28,10,144,
28
300 DATA 224,138,208,4,169,6,137,221,2
24,56,208,4,169,1,137,221,185,221,161,
8
310 DATA 208,2,283,293,232,142,1,208,2
08,192,240,204,2,168,8,134,119,132,228
,96
320 DATA 171,174,2,201,1,240,32,173,8,
6,201,1,240,25,166,208,134,185,2,178
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54,145,153,255,145,141,8,8,140,1,8,172
340 DATA 1,8,192,1,208,1,96,172,1,8,16
9,1,153,253,148,163,252,148,153,251
350 DATA 148,169,0,153,268,148,136,148
,2,210,169,178,141,3,210,169,8,141,4,2
10
360 DATA 192,4,208,12,141,8,8,141,2,11
8,141,1,210,141,4,210,141,8,210,141
370 DATA 1,210,148,1,6,96,165,20,10,14
4,26 173,2,8,201,4,240,19,166,208
380 DATA 134,185,2,170,164,207,142,5,2
08,169,4,141,2,8 148,1,6,173,193,2
390 DATA 201,53,240 12,172,1,6,169,4,1
51,15,147,151,10,147,151 17 147,169,8
400 DATA 152,14,147,288 192,248,208,4,
141,2,6,138,140,1,6 176 96,173,4 6
410 DATA 201 16,240 19,168,249,116,185
,2,170,104,210,142,6,208,169,18,141,4,
6
420 DATA 148,5,6,173,198,2,201 53,240,
11,172,5,6 185,15,132,16,147,151,17
430 DATA 147,151,15 147 169,8,153,14,1
47,208 192,248,208 4 141,4,6,116,146,5
440 DATA 6 144,26,173,6,6,201,84,248,1
9 168,219,128,145,1,178 164,208,142,7
450 DATA 208,169,84,141,5 6,148,7,6,17
3,195,2,201,53 240,31 172,7,6,169
460 DATA 84,157 15,147,151,14,147,153,
15,147,169,8,153,11,147,208,192,248 28
8,4
470 DATA 141,6,6,116,140 7 6 96,165,8,
167 12,157,232,149,157,217 150,157,232
480 DATA 151,202,208,244,174,12,208,22
4,4,208,24 174,9,208,224,1,240,17,174,
10
490 DATA 204,224,1,240,10,174,11,208,2
24,1,244,3 76,198,156,169,8,141,2,216
500 DATA 141,4,210,141,8,210,141,156,2
09,141,1,210,169,150,141 176,152,169,5
5,141
510 DATA 192,1,169,64,141,8,210,169 25
5,141,8,210 162,148,142,1,210,162,8-8
520 DATA 32,169,152,169,67,141,128,2,1
2,169,152,189,8,141,196,2,174,8 6,202
530 DATA 224,127,888,228,162 118,134,7
84,168,158,132 208,169,8,141,1,210,141
,8,210
540 DATA 141,8 210,168,8,169,8 152 8 1
47,152 8 168,152,8,149,152,8,158 153
550 DATA 8,152 208 208 218,132 286 132
,282 111 209 111 218,132,228 133 221,1
69,219,141
560 DATA 192,2 169,8,141 2,4 141,1,8 1
41,4,6,141,5 6 141 6 6 141
570 DATA 7,6,169 4 141,1,6 141 8,6,141
,10,284 169 20,141 178,152 172,10
580 DATA 8,136 288 3 184 184,96,144,18
,6,169,8,141,84,96,141,85 76 141,86
590 DATA 96,141,87,96,192,1,248,9,126,
169,96,151,84 96,136,208,250,96 173 8
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610 DATA 8 208,1,96,169 64,141,8 218,1
69,6,141 3 210 141,7,210,141 7,210
620 DATA 141 8,210 169 218 141,8,210,1
60,144,148,5,6,148,1,210 142,8,8,169
630 DATA 52,157 193 2 12,169,152,174,6
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640 DATA 169 8,153,8,147,151,8 148,153
,8 145,152,8,158 151 8 151 208 208,218
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,8 210 141 1,210 141 2,210 141,1 210
660 DATA 141,4,210 141 8 210,169 4,141
,1 6,172,12,6,192 25,208,21 174 13
670 DATA 6,224,25,208,16 162,16,168 16
174 11 6 232,142,11 6,282 228,26,288
680 DATA 14 174 12 6,212 224,26 288 9
162,16,172,12 6 188 148 12 6 112 11
690 DATA 6,142 78 96 172,12 6 148,69 9
6 171 11,6,141 68,96 169,0 141,8
700 DATA 210 141,8 210 141 3 210 141 8
6 171 151,2 201 51 248 1 96 173 194
710 DATA 2 201 51,248,1 96 173,195 2,2
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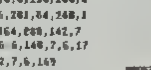

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160	11895	170	19799	180	1410
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220	10572	230	11412	240	10918
250	10812	260	11112	270	12195
280	10542	290	10944	300	11256
310	11353	320	11543	330	11758
340	11546	350	11408	360	10808
370	11718	380	10726	390	11100
400	11663	410	10754	420	11577
430	11549	440	10819	450	11254
460	11471	470	11422	480	10918
490	11727	500	11044	510	11337
520	10537	530	10709	540	10687
550	11277	560	10494	570	10847
580	10265	590	10770	600	10799
610	11111	620	10685	630	10987
640	10724	650	10229	660	11431
670	10918	680	11186	690	10648
700	11524	710	10735	720	10825
710	11498	740	10569	750	12317
760	9131	770	10855	780	10676
790	10964	800	9889	810	10711
820	10586	830	10755	840	10959
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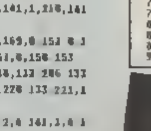
910	10583	920	9241		



Tired of typing?

Take advantage of our finger saving offer on Page 69

Get a little more colour in your life

ANDRE WILLEY looks at a super Sony colour monitor

ONE of the great advantages that the 520ST has over other computers of a similar ilk, such as the Macintosh for example, is its use of colour.

Much has been written about the ST's ability to display 512 colours. However most people can at present only access the monochrome high res mode giving a very clear and readable display but without any colour.

There are two problems standing in the way of the potential colour user. Firstly Atari has not yet released its own £400 dedicated monitor and no release date has as yet been announced. Secondly the 13 pin DIN connector at the rear of the ST is a non standard analog RGB port. Most RGB monitors use the less versatile digital RGB mode.

If you do decide to use a third-party monitor Atari has made things as tricky as possible for you by using a 13-pin DIN socket and there is simply no such plug available on the market at present.

Luckily anyone with a bit of ingenuity should be able to make one up from a small piece of 0.1 inch veroboard with pins stuck through it. Such a lead is available from Silica Shop if you're not too good with a soldering iron.

Alternatively if you don't mind a minor violation of your guarantee you could simply remove the plug from the monochrome monitor and fit an in line connector which would facilitate easy change-over between two monitors.

Apart from waiting for Atari to deliver its own monitor what then are the choices?

In my search I looked briefly at three 14in colour monitors which have analog RGB ports in addition to a standard composite video connector.

- ☐ A converted TV from Fidelity
- ☐ A Microvitec Cub monitor
- ☐ The new Sony monitor

Each was being promoted by the retailer as being ST compatible. Indeed the Cub had been specially modified by Microvitec for use with the ST.

The choice was an easy one. The Fidelity CM14 looked fine although the 80 column mode was understandably a little difficult to read. However at just £200 you must expect to get what you pay for.

The resolution on the Cub-653 was better with 80 column text being quite readable but the colour saturation and contrast were extremely disappointing and there seemed no easy way to adjust either.

By far and away the best was the Sony KX-14CP1 monitor which I was so impressed with that I have since bought one for use with my own ST.

The Sony uses an enhanced version of the Trinitron tube — called the Black Trinitron which includes an antiglare filter in the tube itself. It has a 0.37mm grille pitch allowing a much higher resolution to be displayed than on conventional TV tubes.

The unit is rated at 640 x 200 dots, although I suspect it could handle a little more. The 520ST's 80 column display was rock solid with the text below each icon which is smaller than normal 80 column text still quite readable.

Colour was excellent with a very

Pin assignments for connecting the 520ST to a Sony KX-14CP1

ST pin no	Function	KX-14CP1 Scart pin no
1	Audio out	2 & 6
2	Composite video	N/C
3	General output	N/C
4	Mono detect	N/C
5	Audio in	N/C
6	Green out	11
7	Red out	15
8	Ground	4
9	Horiz sync	20 (via 22 kohm resistor)
	Horiz sync	16 (via 350 ohm resistor)*
	Blue out	7
10	Monochrome out	N/C
11	Vert. sync.	20 (via 2.2 kohm resistor)
12	Ground	21 (via screen optional)
13		

**The resistor used between ST pin 9 and monitor pin 16 is to provide a voltage to select RGB mode on the SCART input. You may find that a 350 ohm resistor causes either a black band at the top of the screen or a black picture with a faint image present. If so simply replace the resistor with a 500 ohm linear pot and adjust until correct.*

bright and vivid display and I was pleasantly surprised how well it coped with two similar colours displayed side-by-side as this often causes shimmering at the border points as for example on a Dragon or Spectrum

The picture can be easily centred by means of the V Size and H-Cent controls and with the image thus centred there was no visible distortion at the edges

The other controls on the side panel allow adjustment of contrast brightness colour volume and hue Unusually all but the colour/hue controls function in RGB mode

The audio performance was only fair with a small front-mounted speaker being the main culprit Frequency response fell short of what I expected but I suppose it's sold as a monitor not as a hi-fi Anyway the sound was well up to the standard of a good portable TV

The unit has as comprehensive a set of inputs as the ST has outputs You can connect either analog RGB or composite video (plus audio) via the 21 pin Scart connector and TTL RGB with or without intensity signal via the 8 pin IBM-compatible digital port

There are also two standard composite video inputs – BNC and a phono – and an audio phono socket Switching between RGB and composite is controlled by a front panel switch making it an ideal monitor to use if you want to connect an ST and one of the 8 bit Atari computers at the same time

In addition to all this the monitor can be used for Pal Secam NTSC 4 43 and NTSC 3 58 television standards Put simply this means that virtually any computer/video recorder in the world can be connected The power supply will automatically select between 110 and 240 volts

The Sony is the largest of the three monitors – with a front panel of 15 x 13 inches and a depth of 17 inches – so be sure that your computer desk is deep enough The design pale fawn/grey casing with black base and screen surround matches in well with any Atari computer – indeed it could have been designed for them

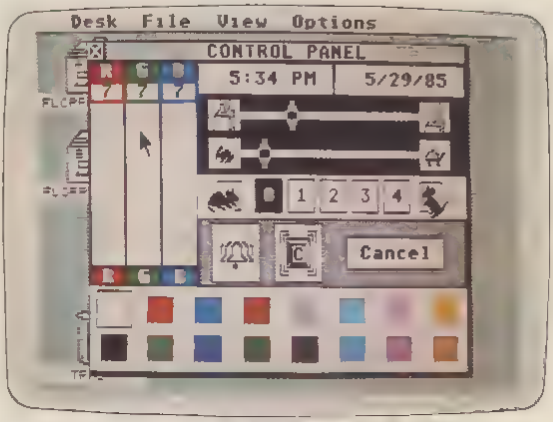
The screen is tilted back at an angle of about 10 degrees although if you want it vertical for use as a TV monitor for instance two clip-on feet are provided to raise the back end

I used the KX 14CP1 with all of my Ataris (800 800XL 130XE 520ST) and also as a TV with my video recorder The display was excellent on each and outstanding with the ST As previously mentioned it is unfortunate that the sound very slightly lets down what is otherwise a superb monitor

At £399 95 it is the same price as the Atari colour monitor will be but has the advantage of allowing the freedom of use that a dedicated monitor can't

So if your ST needs a bit of colour in its life and you've been waiting for the Atari monitor then you need look no further than the Sony KX 14CP1

(With grateful thanks to John Dittrich and Henry McAloon at Sony UK, and Peter Fellows at Software Express for their help)



The Sony KX14CP1 main [illegible]

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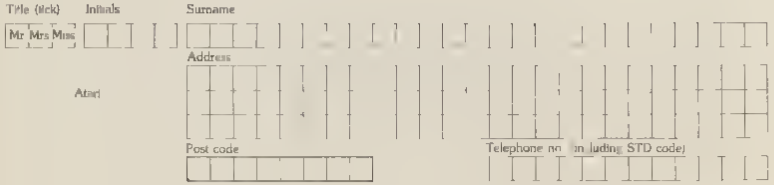

School explores wide-ranging Atari options

THE children of Southmead Primary School in Wimbledon were collecting information for a database about their interests which they entered into one of the school computers.

One question asked what type of home computer they owned. Games machines were included in the survey and it turned out that most children had experience of the Atari.

All mentioned games as the main reason for having a computer. A few members of the computer club did simple programming as well.

Many children have more experience of using the computer in the home than they do at school. Their computer experience in primary school is normally limited to using the school's computer once a week.

Most schools have a machine bought when the Government met half the cost. With the education cuts of recent years, purchasing extra machines has meant sacrifices but if the children are going to learn effectively with computers far more machines are needed.

Seymour Papert, who developed the educational programming language Logo, said at the British Logo Users Group conference at Loughborough University: "If a proper computer culture is to develop in schools then the children need far more machines than the current average of one per 100 pupils."

The computers used in school are expensive and teachers haven't discovered the virtues of machines not prescribed by the Government.

Southmead is a London school with a difference. The children enjoy at least one computer per class. The school recently purchased three Ataris including an 800XL with disc drive.

The attraction of Ataris started with the discovery of the first powerful version of Logo available on a home computer. The Logo was so good we brought an Atari to run it on and discovered that this machine had many other impressive features.

Atari Logo is on a cartridge and the children have none of the problems of loading from cassette or disc. They switch the machine on and Logo is ready to run. It provides an environment of turtle graphics.

The children learn to program by building shapes. They analyse the parts that make up the shape and teach the computer to draw it. Mistakes are common but they provide opportunities for children to solve problems.

All Logos provide turtle graphics but Atari Logo also has sound and sprites controlled in the same manner as the graphics by building procedures.

Logo gives the children power to produce exciting programs and they

By ALAN COODE

love it. They soon produce animated pictures with accompanying tunes. Tiny helicopters or spaceships whizz around the screen.

One group of children constructs a motorway and another illustrates a nursery rhyme with pictures and music.

Atari Logo is the best version for a home computer although there are comparable Logos for more expensive machines.

As Atari Logo has full word and list processing facilities the children simultaneously learn to solve problems and write programs in a high level language.

The children with Ataris at home borrowed the Logo to use over the weekend. Some children borrowed an Atari 400 which the school picked up for £30 in a spring sale.

Other programs were purchased. Atari Writer supplemented the word processing programs already used in school. It was easier to use and the children preferred it.

Then the children discovered Snooper Troops, an American program by Spinnaker Software which had excellent reviews in both the educational and computer press.

It is a criminal investigation undertaken by children. Someone has tied up Mike Tabasco and stolen Lucy the dolphin from her pool. The police are baffled. They suspect Fisheye and several others. The children must find the culprit.

The aim of the program is to teach scientific method to children. They start the investigation with a car, the Snoopmobile, a wrist radio, a camera and the SnoopNet computer.

Children's initial reaction is to rush around making phone calls and interviewing suspects. Soon the information becomes too much to handle and they take stock of the tools the program gives them.

Skills such as note-taking are essential. They make a hypothesis and test their theories.

When they drive to the phone box or to visit an informer, the screen displays a map of the town. The children often have to get to a house before a suspect leaves and they need a knowledge of the streets. They need to draw a map.

They control the car using the keyboard. Driving is realistic – go too fast and you crash and have to wait for the repair man, missing vital messages.

It is an absorbing educational program and it is hard to keep the children away from it. It is fun, but

Alan Coode is head teacher at Southmead Primary School.

requires discipline to find the clues and ignore irrelevant information

It encourages the children to write make decisions and keep accurate records

In fact one of the major advantages of having Ataris at Southmead is the opportunity to use American software like the Spinnaker products There is a considerable difference in the two educational systems but computer experience in America is vast

The home market for educational software has allowed the software houses to produce elaborate and often extremely good products

One program the younger children enjoy is called Factory which has three types of machine – a punch a rotating machine and a strip cutter

The children have to select the correct machine in the right order to produce a product They also have to choose the right task for each machine It is challenging and it exercises the children's ability to think and plan ahead

On the more traditional lines another program provides an exercise for mental mathematics Tessers by Tobbs provides an array for the children to fill with answers

The position of the answers offers a check for the columns have to balance the rows

The children have to think and not just repeat known facts It gives meaning to work with tables

The computer club meeting after school wanted to play games To the purist games appear to have no place in school but research in America now suggests that children who play video games learn complex skills that no other medium can promote

Professor Greenfield, a psychologist at the University of California states that as games require a rapid processing of different bits of information this skill can transfer to other areas of the curriculum

Often the rules for the games have to be deduced by playing them, much more like real life

Professor Greenfield found that university students used to playing video games were more familiar with inductive thinking and that visual and spatial concepts were better taught by computer games than more traditional methods

This all might well be true but the children at Southmead are motivated mainly by the fun and by the desire to see who can score the highest on Pole Position

The future for Atari in schools looks bright particularly with the new ST range The shortage of cash will not go away so value for money is as important as ever

To those schools who have only one or two machines I say do what we have done – invest in an Atari and explore the exciting range of options it provides

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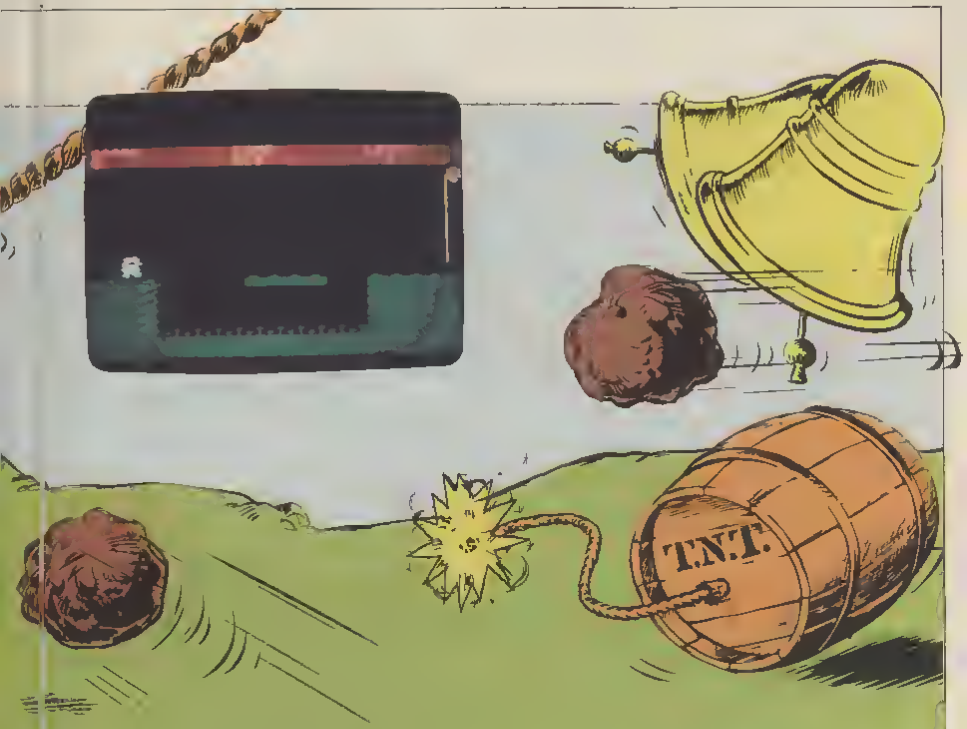
After watching 'Rambo Part 300' for the third time it dawned on them that there was more to life than watching American films with subtitles for those people who speak English. So they decided to kidnap the cinema usherette.

Now that usherette happened to be Esmeralda, and a certain lumpy chap with a hump was not too happy about it and decided to rescue her.

You must guide Mr Humpy across the fairly flat countryside, making him jump over the dykes and avoiding the traps the French have left behind to stop you.

Can you fill Mr Humpy's lumpy hump? Use joystick and Fire to move and jump.

There's a lot of setting up to be done, so don't be dismayed if the "Please wait" message seems to last a good while.



~ rescue Esmerelda

VARIABLES

X,Y	coordinates of Mr Humpy
N$,M$	Hold the character of Mr Humpy s body and head
NA$,HS	Names and scores in high score table
TIME	Time limit for eachscreen
SPIKE	Coordinates of spikes
SPDIR	Direction of spike
BRIDGE	Coordinates of bridge
BRIDIR	Direction of bridge
ROCK	Coordinates of rock
DIR	Direction of rock on screen 14
LIVES	Number of lives left
SCORE	Score of player based on time taken to complete each screen and bonus at end of screen 14

ROUTINES

100	Main program loop
1000	Moves Mr Humpy
2000	Makes Mr Humpy jump
3000	Moves rocks
3500	Moves spikes up end down
4000	Moves drawbridge
4500	Moves plain bridge
5000	Final screen
5500	High score table
6500	Lost a life
6600	Reached end of screen (includes sequence when screen 14 is completed)
7000	Sets up the various screens
8000	Sets up variables
9000	Instructions
9500	Sets up U D G s
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3 REM **********BY B CROSSON**********
4 REM ********************
5 DIM GR$(20),TOP$(26),SPR$(20),MS(2),
M$(1),C(91,P(91,B66(50),HS(51,SI$(26)
10 GOSUB 9600:REM SET UP CHR'S
85 GOSUB 9000:REM INSTRUCTIONS
20 GOSUB 8505 REM SET UP VARIABLES
80 GOSUB 7000 REM SET UP SCREEN
90 POSITION X,Y ? 00;85:POSITION X,Y-1
' ? 86,M$
100 REM **********MAIN LOOP**********
110 00 SCREEN GOSUB 1000,1040,2000,200
0,3500,3050 4000,3500,4000 4500,1000 4
500,4506,5000
115 LOCATE X,Y,01 LOCATE X,Y-1 82 IF 0
1()ASC(M$) 00 82()ASC(M$) THEN GOTO 85
00
120 GOSUB 1000
130 IF K=10 THEN GOTO 6600
140 LET TIME=TIME-5:POSITION 17,2 ? 00
TIME," " IF TIME=0 THEN GOTO 5660
900 GOTO 110
1000 REM **********MOVE HAMPY**********
1010 JOY=STICK(0)
1020 IF STRIG(0)=0 THEN GOTO 2000
1030 IF JOY=7 OR X(10 THEN GOSUB 1500
K=K+1:GOTO 2050
1040 IF JOY=11 OR X)9 THEN GOSUB 2060
K=K-1 GOTO 1090
1045 RETURN
1050 LOCATE X,Y,01-LOCATE X,Y-1,02 LOC
ATE X,Y+1,03 IF 01()32 00 02()32 OR 03
()43 THEN GOTO 6500
1055 SOUND 1,00,10,8
1060 POSITION X,Y-1 86,M$:POSITION X,Y
-2 ? 00;M$
1065 SOUND 1,0,0,0
1070 RETURN
1080 IF M$=CHR$(7) OR M$=CHR$(0) THEN
85=CHR$(4) GOTO 1520
1610 IF M$=CHR$(4) THEN M$=CHR$(6)
1520 POSITION X,Y-1? BR;" ";POSITION X,
Y-1:? 86,M$:M$=CHR$(5) RETURN
1600 IF M$=CHR$(5) 00 M$ CHR$(0) THEN
M$=CHR$(9):B6TH 1520
1610 IF B5=CHR$(5) THEN 85=CHR$(8)
1620 POSITION X,Y ? 00," " POSITION X
Y-1:? 00;" ";M$=CHR$(7) RETURN
2000 REM **********JUMPY JUMPING**********
2010 M$=1:IF JOY ? 08 JOY=11 THEN M$=0
2626 FOR A=-0-75 TO 0 75 STEP 0.5:POSI
TION X,Y-? BR," " POSITION X,Y-1:? 86,
" " Y-Y+M*A
2026 SOUND 0,0B5(60+A*2),10,8
2030 IF M$=CHR$(6) AND M1=0 OR X(10 T
HEN X=X+1
2040 IF M$=CHR$(7) AND M$=0 AND X)6 TH
EN X=X-1
2050 POSITION X,Y-? BR,M$:POSITION X,Y
-1-? BR,M$
2060 ON SCREEN GOSUB 3000 2200,2000,20
00,2500 3050,4000,2500,4000,4000,2600,
4500,4500 RETURN
2070 LOCATE X Y,01:LOCATE X,Y-1,02:IF
01()ASC(M$) OR 02()ASC(M$) THEN GOTO 5
500
2071 IF SCREEN=10 AND BLOCK()19 AND BLO
CK(40 000 X=17 THEN GOTO 6500
2075 SOUND 0 0,0,0
2076 LET TIME=TIME-5:POSITION 17,2:? #
6,TIME," ":IF TIME=0 THEN GOTO 6660
2000 NEXT A
2010 LOCATE X,Y+1,01:IF 01()43 THEN GO
500 6500
2100 DEFOUN
1000 REM **********MOVE ROCK**********
2010 POSITION ROCK,10:? 06," ":POSITIO
N 19-ROCK,12 ? 06;" "
2020 ROCK=ROCK-1:IF ROCK=0 THEN ROCK=1
0
2010 POSITION ROCK,10:? 06;CHR$(109) P
OSITION 19-ROCK,12 ? 06;CHR$(109)
3000 RETURN
3050 POSITION ROCK,12:" M$," "
3095 IF SCREEN<>3 000 (ROCK 4 OR ROCK=9
06 ROCK=14) THEN POSITION ROCK,12:? #
6,CHR$(142)
3000 ROCK=ROCK-1:IF ROCK=0 THEN ROCK=1
9
3020 POSITION ROCK,12.? 00,CHR$(105)
3090 RETURN
3505 REM **********MOVE SPIKES**********
3510 FOR F 4 TO 16 STEP 5 POSITION F,5
PIKE:? 06;CHR$(102) POSITION F SPIKE 1
;? 00," ":NEXT F
3520 LET SPIKE SPIKE+SPOIN
3530 IF SPIKE=0 THEN SPOIN=1
3640 IF SPIKE 24 THEN SPOIN -1
2645 IF SCREEN=9 THEN GOSUB 3050
3550 RETURN
4500 REM **********DRAGON FIRE**********
4520 POSITION ORIDGE,15 ? BR,CHR$(43).
POSITION 19 ORIDGE,15:? BR;CHR$(43) PO
SITION ORIDGE+1 15:? 00," " POSITION 1
8-ORIDGE,15:" 00," "
4020 ORIDGE=ORIDGE+ORIDIR IF ORIDGE=9
THEN ORIDIR =ORIDIR
4010 IF ORIDGE 5 THEN ORIDIR=1
4035 IF SCREEN=9 THEN GOSUB 3006
4040 RETURN
4500 REM **********MOVE ORIDGE**********
4510 POSITION ORIDGE,15 ? BR;CHR$(431
" " POSITION ORIDGE-0,15:? 06," ":CHR$
1421
4520 ORIDGE=ORIDGE+ORIDIR
4530 IF ORIDGE=9 THEN ORIDIR=1
4540 IF BRIDGE 13 THEN ORIDIR=-1
4550 IF SCREEN=10 THEN RETURN
4660 IF SCREEN=12 THEN GOTO 2060
4570 POSITION X,SPIKE:? BR;CHR$(142):P
OSITION 16,SPIKE ? BR,CHR$(142)
4500 POSITION 3,SPIKE-1 ? 06;" ".POSIT
ION 16,SPIKE-1:? BR," "
4690 SPIKE=SPIKE+SPOIN:IF SPIKE=10 TRE
N SPIKE=1
4591 IF SPIKE=16 THEN SPRIK=-1
4595 RETURN
5000 REM **********FINAL SCREEN**********
5010 POSITION ROCK,14:? 06;" ":ROCK=RO
CK+SIK
5000 IF ROCK=16 THEN SIK=-1
5626 IF ROCK 0 THEN SIK=1
5660 POSITION ROCK,14:? 06;CHR$(109)
5050 BLOCK=OLOCK+1:IF OLOCK=20 THEN FO
R F=10 TO 16:POSITION 17,F:? 06;CHR$(1
42) NEXT F
5000 IF BLOCK=40 THEN OLOCK=0 FOR F=10
 TO 16:POSITION 17 F:? 00;" ":NEXT F
5070 POSITION 3,SPIKE:? 06;CHR$(142):P
OSITION 2,SPIKE-1 ? 06,"
5000 POSITION 6,SPIKE-2:? BR;CHR$(142)
;CHR$(142) POSITION 6,SPIKE-1 ? 06,CHR
$(154);CHR$(150)
5690 POSITION 6,SPIKE ? 06;"
5100 SPIKE=SPIKE+SPOIN
5110 IF SPIKE=11 THEN SPOIN=1
5120 IF SPIKE=14 THEN SPOIN=-1
5130 RETURN
5500 REM **********DIGN SCORE**********
5510 IF SCORE(M5(5) THEN GOTO 5700
5520 GRAPHICS 0 SETCOLOR 2,0,0
5530 ? ? ? "@@(1 000: you're in" ?
"the high score table "
5540 ? ? :? ? "What is your name ",
5550 INPUT 51$
5560 IF LEN(51$)(10 THEN 51$(LEN(51$)+
1)=" " REM 10 spaces
5570 M5(5)=SCORE M05(41) 51$
5500 FOR I=5 TO 2 STEP -1
5590 IF M5(I)(M5(I-1) THEN 0630
5600 51$ M$(1+I0 3 I+10) M05(I+10-9,I
+10) M$(I+10 I9,I+10-10)
5610 M$(I+10-19,I+10 10) 51$
5620 SCORE M5(I) M5(I-M5(I L):M5(I-1)
=SCORE
5630 NEXT I
5700 GRAPHICS 10 SETCOLOR 2,12,0 POKE
755,0 SETCOLOR 2 0,12:SETCOLOR 1,0,15
5710 POSITION 4,0 ? BR;"HIGH SCORES"
5711 FOR F=1 TO 10:POSITION F,1 ? 06;C
HR$(1701 POSITION F,0 ? 06;CHR$(1270):N
EXT F
5712 FOR F=2 TO 0 POSITION 0 F ? BR;CH
R$(110) POSITION 19,F:? 06,CHR$(170) N
EXT F
5720 FOR I=1 TO 5 POSITION 1,Y+2 ? 00,
M0$(I*10-9,I*10),"- ",M5(I):NEXT I
5730 POSITION 0,10 ? 00,"PRESS FIRE TO
 BEGIN "
5740 GOSUB 9306:GOTO 20
5500 REM **********LOST A LIFE**********
5006 POK :50000 0,0,0,0 50000 1,0,0,0
5610 E1VES=L1VES-1:FOR I 100 TO 255 ST
EP 10
5614 POSITION X,Y:? 06;" " POSITION X,
Y-1:? 06 " "
5615 POSITION X,Y ? BR;CHR$(0) POSITIO
N X,Y-1:? BR,CHR$(5)
5650 SOUND 0,I,10 4:SOUND 1,Y/2,10 3:S
OUND 2,I/4,10,2:SOUND 3,100-I,10,1
5521 POSITION X,Y:? BR," " POSITION X,
Y-1:? BR " "
5523 POSITION X,Y ? 06,CHR$(0) POSITIO
N X,Y-1 ? BR CHR$(7)
5624 FOR F=1 TO 5:NEXT F
5625 NEXT I:FOR F=0 TO I 50000 F 0,0,0
 NEXT F
5626 POSITION X,Y 1 ? BR," " POSITION
X,Y ? 06,CHR$(1261;CHR$(127)
5630 FOR I=15 TO 0 STEP -1 SETCOLOR I,
0,1.F00 F 1 TO 20 NEXT F:NEXT I
5640 IF L1VES20 THEN K=0 Y 14 TIME=500
 (75*LEVEL) GOTO 40
```

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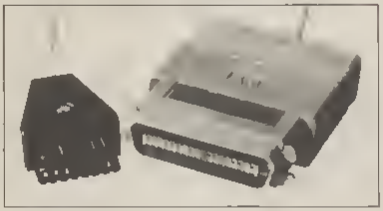

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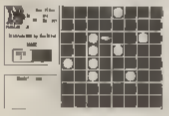

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```
6566 GOTO 5506
6600 REM ********EACH END OF SCREEN******
6610 FOR F=1 TO 4 POSITION X,Y-1:? 00;
CHR$(5):POSITION X,Y:? 00;CHR$(124) SO
UND 0,00,10,10
6620 POSITION X,Y-2 ? 00;" ":FOR I=1 T
O 20:NEXT I.POSITION X,Y:? 06   " POSI
TION X,Y-1 ? 00;CHR$(124)
6630 POSITION X X-2 ? 06,CHR$(5):SOUND
 0,70,10,10 FOR I=1 TO 20 NEXT I NEXT
F
6635 SOUND 0,0,0,0
6640 IF SCREEN=14 THEN GOSUB 6706
6660 SCREEN=SCREEN+1 SCORE=SCORE+TIME
TIME=600 (LEVEL*75) N 0 Y=16
6656 GOTO 40
6700 POSITION X,Y:? 06 " " POSITION N,
Y-1:? 00," "
6710 FOR F=13 TO 7 STEP -1 POSITION 8,
F+1 ? 00," "POSITION N F ? 00 CHR$(12
4) POSITION N,F-1 ? 00 CHR$(6)
6715 FOR G 1 TO 20 NEXT G NEXT F
6720 POSITION X,Y ? 00 ' " POSITION N,
Y-1 ? 06," "
6730 FOR I=17 TO 6 STEP -1 POSITION I,
F+1 ? 00 CHR$(6) " " POSITION I,F:? 06
,CHR$(7)," "
6735 FOR G=1 TO 15 NEXT G
6740 SOUND 0,00 10,0:POSITION 1,F+1 ?
06 CHR$(91," " POSITION 1,F ? 00,CHR$(
73," " SOUND 0,0,0,0
6750 FOR G 1 TO 10:NEXT G IF I=5 THEN
POSITION I F ? 00," " POSITION I,F+1 ?
06;" " F=F-1
6760 IF I ? THEN POSITION I+1 F:? 06,"
 ":POSITION I+1,F+1 ? 00," "
6770 NEXT I
6780 RESTORE 6506
6790 GRAM N,0 IF N=255 THEN SOUND 0,0,
0,0.GOTO 6610
6800 SOUND 0,N,10,15:FOR F=0 TO 0 NEXT
 F GOTO 6795
6810 POSITION 0,0.? 00,"LES" POSITION
I,5:? 06;"YOU"
6820 FOR G=1 TO 20 NEXT G
6830 POSITION 5,5 ? 06," ":POSITION 5,
6 ? 00;" " FOR F=5 TO 16 POSITION 4,F-
1 ? 06," "
6840 POSITION 4,F ? 06,CHR$(16) POSITI
ON 4,F+1 ? 00,CHR$(11) SOUND 0,40+(F*1
0),10,10 FOR G=1 TO 20 NEXT G
6850 SOUND 0,0,0,0 NEXT F
6860 POSITION 4,F:? 00," " POSITION 4,
F-1 ? 06;" "
6870 FOR F=1 TO 100 SOUND 0,55,10,0 SC
ORE SCORE+10 POSITION I,2 ? 00;SCORE S
OUND 0,0,0,0 NEXT F
6880 LEVEL=LEVEL+1 RETURN
6900 DATA 11,25,20,25,25,25,41,65,37,2
5,47,25,0,25,64,25 57,25 72,25,85,64,7
6,25,50,25,0,25,120,28
6910 DATA 114,25 144,25,173 64,153,25,
173,25,102,25,153,25,0,75,47,30 0,25,2
55,255
7000 REM **********SET UP SCREEN*******
7010 GRAPHICS 17+IF SCREEN=15 THEN SCR
EEN=1
7020 ON SCREEN GOSUB 7046,7100,7106,71
06,7130,7166,7206,7130,7200,7210,7166,
7210,7210,7106
7030 RETURN
7040 SETCOLOR 0,12,5 SETCOLOR 1 0,15:5
SETCOLOR 2,1,5 SETCOLOR 3,1,15 POKE 756
 RAM/256
7050 BLIST=PEEK(560)+256*PEEK(561)
7060 POKE BLIST+3,0+92 POKE BLIST+0,2
7070 POSITION 0,15 ? 00,105;FOR F=16
TO 22 POSITION 8,F:? 06 GOSUB NEXT F
7080 POSITION 3,6 ? 06,"SCORE" POSITIO
N 17,6:? 00 "LIVE" POSITION 10 X:? 06,
"LIVES"
7085 POSITION 1 2 ? 00,SCORE POSITION
17,2:? 06;TIME POSITION 12,1 ? 00 LIVE
S
7086 POSITION 19 4 ? 00,CHR$(224):POSI
TION 19 5:? 06;CHR$(253) FOR F 0 10 11
:POSITION 19,F:? 00,CHR$(253) NEXT F
7095 DOCK=10
7099 RETURN
7100 GOSUB 7046:FOR F=1 TO 15 STEP 5 P
OSITION F,15:? 06;CHR$(44);"  ":POSITI
ON F,10 ? 00,CHR$(45);" "
7110 POSITION F,17:? 00,CHR$(45)," "
NEXT F
7120 RETURN
7130 GOSUB 7106 FOR F 4 TO 16 STEP 5 P
OSITION F,15:? 06;CHR$(107) POSITION F
,10:? 00,CHR$(107)
7135 SETCOLOR 2,7,10:POSITION F,17 ? 0
6,CHR$(166) NEXT F
7140 SOUND 0,0,0,0 RETURN
7150 GOSUB 7046:POSITION 4,15:? 00,CHR
$(44),SPOKE(1,10)
7160 FOR F 10 TO 20 POSITION 4,F:? 00;
CHR$(86) SPOKE(1,10) NEXT F
7165 FOR F 5 TO 14 POSITION F,20 ? 00,
CHR$(161) NEXT F
7170 IF SCREEN()8 AND SCREEN()11 THEN
RETURN
7180 POSITION 7,15:? 00;CHR$(83),"  "
,CHR$(43) POSITION 7,16:? 06 CHR$(42);
"  ",CHR$(42)
7185 POSITION 7,4:? 00;CHR$(224);"  "
,CHR$(224) POSITION 7,5:? 00;CHR$(253)
,"  ";CHR$(253)
7186 FOR F=6 TO 9:POSITION 7,F:? 00,CH
R$(253);"  ",CHR$(253):NEXT F
7190 RETURN
7200 GOSUB 7150:BRIDGE=5:BRIDGE=1:POKE
 1250 4,15:? 06,CHR$(43):RETURN
7210 GOSUB 7150:BRIDGE=11 BRIDGE=-1:SP
OKE 1250 4,15:? 06,CHR$(43):RETURN
7220 RETURN
7166 GOSUB 7040 SETCOLOR 2,7,10
7310 FOR F=4 TO 9 POSITION 5,F:? 06;CH
R$(1,4) NEXT F
7320 POSITION 5,8:? 06,10;R$(1,9) POSI
TION 9,9 ? 00,CHR$(1,9)
7330 POSITION 2,16 ? 06,CHR$(44),CHR$(
142);" ":POSITION 2,16:? 00,CHR$(45),C
HR$(187);" "
7340 POSITION 2,17:? 06 CHR$(45),CHR$(
186)," "
7350 SPOKE 14*SPOKE=-1 ROCK=15:BIG -1
BLOCK=0
7360 FOR F=9 16 12 POSITION 6 F ? 06;C
HR$(142),CHR$(142) NEXT F
```

```
7370 POSITION 5 5 ? #6;CH0$(20) "  ";P
OSITION 5,6 ? #6 CH0$(31),"  "
7400 RETURN
7500 REM ********************VARIABLES*********
8010 SCREEN=I %=0 T=16 LEVEL=0
8020 A$=CH0$(6) :P$=CH0$(5)
8030 SCORE=0 LIVES=3 TIME=500
8040 RETURN
9000 REM ***********INITIALIZATION**********
9005 RESTORE 9430 FOR I = 1 TO 9 READ G
,H(I) : NEXT I
9010 GRAPHICS 2:SETCOLOR 0,12,10 SETCO
LOR 4,8,8 SETCOLOR 1 0,15 POKE 756,PEE
K(756)
9020 FOR F=1 TO 20 CA$(F)="":TOP$(F)
="" SP0$(F)=" ":NEXT F
9030 POSITION 5,4 ? #6;CH0$(7),"DES RE
LES";CH0$(5) POSITION 5,5 ? #6;CH0$(8)
,"       ";CH0$(8)
9040 POSITION 5,8 ? #6;TOP$(1,11);POSI
TION 5,7 ? #6 CH0$(1,11)
9050 POKE 755,0 POKE 656,1 POKE 657,12
 ? "BY ARAMELLE CHAPMAN" POKE 650,1 PO
KE 657,12 ? "PRESS FIRE BUTTON"
9060 GOSUB 9980
9070 GRAPHICS 0 SETCOLOR 2,0,0 SETCOLO
R 4,8,8 POKE 755,0
9080 POSITION 11,2 ? #6 E S    B E L L
 S"
9090 ? ,? :? " Once upon a time the Fr
ench invaded Lincolnshire and capture
d Esmeralda "
9100 ? " and a certain Humpy Chap with
 a hump is not too happy and has decid
ed to   try and rescue her "
9110 ? " Guide Mr Humpy across the fa
rmyard,over,under,jumping over dyke
s and  "
9120 ? "avoiding the traps the French
have    left to stop you "
9130 ? " Can you help Mr Humpy's lumpy
 hump?"
9140 ? " "    Use Joystick and Fire to
 jump"
9150 ? "  ? "Press Fire button . "
9160 GOSUB 9980
9170 FOR I=1 TO 5 POS(I)=10-I,I:A(I)="DE
S SCORES" NS(I)=6000-I*1000 NEXT I
9180 RETURN
9490 DATA 9998,171,9998,171,9991,210,9
991,210,9998,171,9998,171,9991,210,999
1,210,9992,120
9495 RETURN
9500 REM **********  G.G'S**********
9505 A0$=CHR$(PEEK(106)-16)*256
9510 GRAPHICS 17 POKE 86 "      PLEASE
 WAIT"
9520 C=0:FOR D = 0 TO 7048
9530 A=PEEK(57344+D)
9540 POKE A0$+D,A
9550 NEXT D C=2
9560 POKE 756 A0$/256 RESTORE 9736
9570 C=C+1 IF C=15 THEN C=26
9571 IF C=31 THEN C=59
9572 IF C=65 THEN RETURN
9580 RESTORE:CK=0:
9590 FOR D = 0 TO 7:READ V POKE 3640,D N
EXT D
9626 GOTO 9570
```

```
9700 DATA 0,4,14,4,60,126,60,60
9701 DATA 124,254,254 126,60,105 153,1
02
9702 DATA 0,126,126,114 102,102,126,60
9703 DATA 124,254,254,126,60 24 24,30
9704 DATA 32,62,126,76 102 232,97 60
9705 DATA 62,127,127,126,62,102,227,10
2
9706 DATA 62,127,127,127,62,24,24,120
9707 DATA 255,91,127,235,105,247 222,2
47
9708 DATA 16,56 125,255,217,127,219,25
6
9709 DATA 0,0,192,224 246,104,244,210
9710 DATA 220,252,246,222,218,120,240,
252
9711 DATA 96,56,24,90,90,24,96,30
9712 DATA 24,60,90,24,24,126,60,24
9713 DATA 24,24,24,60,102,102,126,60
9714 DATA 96,60,96,106,60,255,166,255
9715 DATA 24,62,126,255,255 126 126,40
9716 DATA 0,60,46,70,70,39,56,56
9717 DATA 250,60,60,126,126,126,255,30
9718 DATA 0,0,24 66,66,102,90,102
9719 DATA 50,120 255,88,152,108,152,IF
0
9720 DATA 200,255,126,60,66,99,15,7
```

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```
9721 DATA 128,128,128,128,128,128,128,
128
9722 DATA 0,16,40,102,114,126,28,8
9723 DATA 0,1 220,254,254,224,0,0
9900 REM ****** MODELLOUES TUBE*****
9910 J=1 SOUND 2 191,10,1
9920 RESTORE P:J= SOUND 1,C(J),10,4:IF
 J=3 I=0 J=0
9930 READ I:IF I=0 THEN J=J+1:GOTO 292
0
9940 SOUND 0,I,10,10:SOUND 1,I+2,10,10
9950 IF PEEK(20)<6 THEN 9950
9960 POKE 20,0 IF STRIG(0)=1 THEN 9930
9965 FOR F=0 TO 3:SOUND F,0,0 0:NEXT F
9970 RETURN
9980 DATA 85,76,76,76,72,76,64,76,57,7
6,80,76,67,76,58,76,67,76,47,58,57,67,
58,57,67,58,57 67,47,47,0
9991 DATA 67 58,67 58,57 58,57,64,57,5
0,57,50 47,58,47,0
9992 DATA 64,57,72,84,76,72,85,78,76,0
5,76,102,114,120,144,152,173,192,173,1
52,144 120,114,102 152,140
9992 DATA 120,114 102,76,0
```

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	6691	2	5461	3	5511
4	8692	5	11721	10	5812
20	5774	30	6102	40	5814
50	8359	100	4912	110	13566
125	13968	120	1975	130	3514
140	12475	900	1021	1000	6227
1010	9650	1020	4093	1030	8950
1040	8528	1045	1498	1050	16427
1055	2541	1060	9357	1065	2326
1070	1498	1500	5321	1510	5127
1520	12825	1600	5346	1610	5145
1620	11041	2000	5837	2010	5755
2020	14567	2025	4211	2030	7477
2040	7471	2050	8359	2060	13566
2070	13968	2071	12359	2075	2321
2076	12476	2080	1329	2050	7444
2100	1490	3000	5018	3010	7640
3020	7885	3030	11934	3040	1498
3050	6911	3055	10588	3060	5745
3070	5690	3080	1498	3500	5152
3510	10111	3520	6429	3530	4635
3540	4329	3545	5122	3550	1498
4000	5260	4010	223951	4020	10466
4030	4571	4035	5174	4040	1498
4500	5035	4510	11422	4570	4165
4570	4979	4580	5101	4550	5128
4560	4704	4570	11942	4600	10249
4530	8765	4591	4941	4595	1498
5000	5165	5010	7509	5020	4207
5030	4015	5040	5602	5050	15327
5060	12813	5070	108716	5080	25315
5090	4656	5100	3764	5110	4986
5120	4915	6130	1458	5500	4866
5510	5712	5520	6083	5530	12685
5540	7479	5550	7070	5560	10031
5570	4252	5580	14591	5590	4078
5600	5218	5610	15691	5620	7627
5630	1345	5700	129722	5710	5987
5711	13983	5712	115947	5720	21660
5730	7817	5740	1530	6580	4691
6585	5848	6510	7856	6530	8260
6535	10036	6520	117465	6521	8268
6523	10362	6524	3681	6525	7681
6526	10778	6530	11879	6540	9818
6550	1871	6600	5507	6610	15458
6620	17584	6630	17061	6635	2321
6636	5269	6640	12201	6650	1422
6700	8783	6710	17547	6715	5831
6720	8280	6730	16218	6735	1680
6740	16897	6750	14568	6760	18046
6770	1245	6700	2100	6790	8264
6800	8396	6810	8424	6820	18100
6830	14743	6840	17635	6850	16577
6860	7592	6870	16740	6880	16612
6890	14015	6910	13654	7000	5107
7010	7605	7020	13710	7030	6458
7040	14585	7050	5468	7060	16564
7070	12185	7080	16540	7085	11052
7086	15157	7050	1483	7055	1498
7100	16896	7110	8980	7120	1498
7130	16475	7125	15537	7140	5721
7150	8774	7160	10559	7165	9031
7170	7529	7180	14081	7185	10758
7186	10552	7190	1496	7200	12330
7210	5664	7215	16675	7220	14590
7100	5052	7110	8286	7220	9715
7330	11575	7240	6082	7250	7580
7360	10160	7270	10690	7400	1498
8000	4913	8010	5020	8020	3422
8030	5859	8040	1498	5000	5672
5005	10251	9010	16105	9020	9151
9030	15147	9040	5956	9050	10555
9060	1585	9070	10001	5000	5827
9050	22650	9100	24587	9110	21750
9120	15057	9130	10050	9140	9201
9150	7070	9160	1585	9170	12736
9100	1690	9450	13251	5499	1498
9500	4572	9505	3761	9510	7138
9520	1580	9530	2765	9540	8252
9550	2150	9560	5604	9570	3826
9571	3969	9572	10511	9580	21111
9590	7462	9620	1987	9700	40831
9701	5447	9702	5154	9703	49571
9704	4072	9705	54266	9706	49770
9707	5562	9708	54591	9709	4950
9710	5585	9711	48726	9712	48911
9713	4779	9714	5027	9715	52101
9716	4102	9717	51501	9718	44871
9719	5501	9720	6752	9721	56131
9722	4681	9723	6419	9900	5726
9910	1491	9920	8405	9930	6177
9940	5774	9950	1071	9960	9577
9965	5560	9970	1650	9990	10732
9991	7071	9992	10725	9991	1358

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YOU VE heard of Murphy the guy who wrote the Laws? What you might not realise is that he formulated all of them while trying to write a check sum program

Last month s issue of *Atari User* contained several features most of which revolved around the Get It Right check-sum program

First of all if you ve typed in the program and got it running you may have noticed that it doesn t produce the same check sums that we printed at the end of the programs

The way to correct this is to make a small but important change to the program in line 4210 Make the line as follows

```
4210 CHSUM=0:TRAN=1
```

To produce the check sums at the end of this month s and all future programs you ll have to make one other additional change to the check-sum program in line 4250 Change this line as follows

```
4250 CHSUM=CHSUM+ASC(LINE$(A,A))+TRAN:
TRAN=TRAN*2-3*(TRAN>5)*TRAN
```

Oops!

Be sure to make both of these changes to produce this month s check sum tables

If you bought the monthly disc or tape last month you ll have found a version of the program which gave completely different results Unfortunately that was a wrong version However it shouldn t have mattered last month because if you d bought the disc or tape you wouldn t need the check-sum program

The correct version will be going out on all subsequent monthly discs and tapes

To round off the saga here are the correct (fingers crossed) check sums for the program itself after making both of the above alterations Maybe this time we ll Get It Right!

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2425	20	5690	30	5395
40	9853	45	5887	50	2424
60	9847	65	2671	70	10010
75	4448	80	5884	81	6713
82	4654	85	8672	86	5483
85	6445	96	5015	100	6896
105	4798	110	4681	120	5824
140	5635	145	5536	250	1744
999	42694	1000	3748	1010	1498
1040	671	1050	24461	1060	4769
1070	1498	1080	7144	4005	3244
4010	1825	4020	4682	4030	5543
4050	2932	4060	12774	4070	5659
4080	7768	4090	6819	4100	5527
4200	3496	4210	3069	4240	2676
4250	13278	4260	4329	4270	1490
4280	10725	4310	7009	4311	5514
4360	12915	4400	8682	4410	6161
4420	6238	4470	12915	4500	871
4010	14742	4542	16252	4530	11307
4535	5444	4540	11317	4550	1490
4560	5492	4565	5465	4610	6629
4620	12407	4630	9008	4700	9603
4710	12749	5000	7054	5010	10676
5020	8834	5030	1901	5040	5909
5060	5585	5090	7947	5095	2698
5100	1876	5110	2026	5120	6562
5125	1559	5130	8645	5140	1856
6000	5826	6100	7796	6110	9231
6120	5885				

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Brataccas puts on a hard act to follow

IF you saw the STs on the Atari stands at last year's PCW show you can't fail to have noticed a pre-release version of **Brataccas** being demonstrated. The graphics quality alone was enough to make it stand out from the crowd.

Now you can go out and buy a copy at a cost of £34.95 and the finished version certainly lives up to the expectations created by the demo.

In the game – or interactive video as Psygnosis prefer to call it – you play the part of Kyne, a former genetic engineer who has been convicted of a trumped-up charge of genetic fraud. As the graffiti constantly reminds you, Kyne is guilty.

The government police and underworld would all like to get their hands on you and you for your part would like to get hold of Koll Worpt the architect of your downfall.

In case you're wondering, Brataccas is the name of the planet where the action takes place.

The other inhabitants have their own lives to lead and will continue to do so even if you choose to sit in a bar all day. This means that some of them might not *be* you sit in a bar all day!

The task you face in the role of Kyne obviously pushes the game towards the adventure category. However the range of actions available for Kyne calls for arcade type control skills.

There are options to use keyboard or joystick but really the game is designed to be used with the mouse. For this reason you may have to spend some time learning how to control the character. Certainly I found myself jumping into walls more often than I might normally. Once you do get the hang of it the game is superb.

I'm not going to give you any clues about what you should do. Suffice to say that there's plenty to keep your mind and your mouse-hand active for quite some time.

Pressing Help at any time calls up an option screen. As well as providing the mechanism for saving and restoring games, entering demo mode or choosing the control device, this also provides a convenient way to pause the game.

After all in a game where the other characters have independent lives you can't rely on them to wait patiently while you answer the phone.

The other time at which action freezes is when you're offered a choice. For example if a Snitch asks 'Want to know anything?' a series of thought bubbles appear above Kyne's head, starting with 'Mmm... shall I...'.

The sequence might be something like 'ask for information', 'ask about the evidence', 'ask where I can get a drink', 'say nothing'.

These bubbles will continue to appear in sequence and you simply press the left-hand mouse button to choose the desired action. In this way you can take as long as you like to decide – for once the inhabitants of Brataccas hang on your every word.

Until Brataccas the only games I'd seen for the ST were conversions from other machines. Here at last is a game written specifically for 68000 machines like the ST, Fat Mac and Amiga.

It's done more to bolster my faith in the machine than anything that's emerged from Digital Research or Atari.

Perhaps that's because Psygnosis have not used Gem [illegible] It's but have written their own routines to do everything. While Gem provides a consistent interface so that all pages will look familiar, Brataccas uses the machine to best advantage.

From the Roger Dean illustration and poster to the end of the game, Brataccas sets the high standard which the machine deserves.

It's going to be a hard act for other software houses to follow. **Cliff McKnight**

Do you want

IF like me you've been waiting patiently for **Mercenary** to arrive from Novagen, let me tell you right away that your waiting wasn't in vain.

A soldier of fortune you've crash-landed on the planet Targ. It's the 21st century so such crashes are not fatal. However all's not peace and quiet on Targ. Quite the opposite – there is a bitter conflict between the Palyars and the Mechanoids.

Your ultimate goal is to escape from the planet... but how? Should you join one side and fight the other? Which side should you join?

Should you join neither side and try to stay friends with both? Or play both sides off against each other? Or maybe just steal a ship and blast everything in sight?

The choice is yours and there's more than one way to achieve success. But first you start the game on the surface of Targ. There are two kinds of vehicle if you can get them – one is ground based and the other allows flight. There are also underground complexes accessible from the surface so there's plenty to explore.

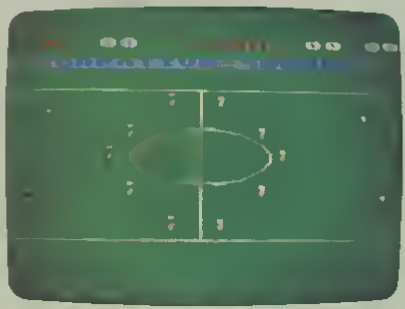
Your interaction with Targ takes place via Benson, an almost human PC and it's on Benson's screen that all the action takes place.

Benson's constantly monitoring the situation and reporting, even asking the occasional question. As the instruction leaflet says, your contribution to the partnership is flair and endeavour.

Benson must be quite strong judging by the size of the box of provisions which I managed to take. It's a pity he can't draw a map for you – you'll have to do that yourself.

I'm not going to tell you any

SOCCER SCORES BUT SNOOKER MISCUES



SPOT the Ball from Creative Sparks is a double game package aimed at the sports enthusiast. It contains Soccer and Snooker both multi-player games simulating two of the country's favourite entertainments.

Soccer is the most realistic game of football I have played on a home micro.

It caters for up to four people either four against the computer or two on each side but the game is just as entertaining played by single players.

There is an option to select a match that will last for 10 45 or 90 minutes.

Press the fire button to kick off. On an individual basis you can control any one of the 11 players on your team on condition that he is nearest the ball.

Pressing the fire button in these circumstances flashes the number of the first joystick pressed (1 4) momentarily in the position occupied by the character on the screen.

This is only relevant in the multi-player game to identify which of the participants is controlling the man with the ball.

Once you have possession the rest of the team runs forward with you and you are chased by one or two of the opposition. They are certain to catch you as your progress is slower once you have the ball.

Success in surviving a tackle tends to depend on whether or not your opponent can guide his player accurately over the ball. However should you decide to pass the ball a second press of the fire button will kick it in the direction in which you are running.

Retrieving the ball is again a matter of getting one of your players nearer to it than one of the opposition and again pressing the fire button.

When the ball goes out of play possession goes as usual to the other team.

The ball is thrown in under computer control using a player from that team in an apparently random direction and the chase is on again.

The graphics are nicely done and the animation smooth. I soon found the game fun to play and very addictive.

However I cannot say the same for Snooker.

As a keen fan of the real game I have played many versions on a variety of micros but I found this one very disappointing.

It's a standard implementation with a plan view of the table showing 15 red balls and six colours.

You control the cue ball's starting position in the D using the four arrow keys. The joystick moves a white cross around the screen to establish the direction in which you want the cue ball to travel.

The power of the shot is selected using the blue bar which constantly rises and falls at the side of the screen.

When the bar is at the right length for your shot either short for a soft shot or long for a hard one press the fire button.

Because of the Atari's restricted colour set in the mode used the green and pink balls have been indicated using white circles and the brown is a red on a black circle but this does work and the game is playable.

The major letdown for the real enthusiast is the inability

t to live for ever?

more about the content of the game because I don't want to spoil it for you.

What I will say is that the quality is high and the cost represents good value for money. The tape is £9.95 and the disc £12.95.

Both contain two versions a 48k version for expanded 400 and 800 machines and a 64k version for 800XL and 130XE machines.

Graphics and animation are good there is scope for different styles of play and it should be big enough to last you quite a while.

In fact given that you never get killed you could literally play forever. Fortunately then there's a Save option so you can get some sleep occasionally.

Also if you find yourself in an undesirable situation like stuck in the desert with days of walking ahead of you there's a Quit option. The price you pay for this is that your possessions get scattered around.

When you do manage to achieve escape status make sure you save the game because this will give you beneficial entry into Mercenary II.

You mean there's more? As far as I'm concerned Paul Woakes can take his time writing the sequel – I think I'll be spending quite some time on Terg.

Dave Russell

to impart any kind of spin on the cue ball

This makes ball control a virtual impossibility and as a result the game ceases to be one of skill

There are several versions on the market for a variety of micros that implement full ball control as standard

Because of its shortcomings this version is left way down the list and as an individual game I wouldn't entertain it

The fact that it is paired with a great football game gives it a chance of success and taken as a whole the package is good value for money at £9.95 for the 32k tape

David Andrews

POLE LEFT AT THE POST

ELEKTRAGLIDE is a superb new driving game from English Software. Throw away Pole Position and all its clones – this is the one you want.

The insert describes it as a fantasy racing epic which sums it up neatly.

It's fantasy because a variety of obstacles come bouncing down from the sky to impede your progress. If real driving ever gets like this I'll go back to walking.

It's racing against the clock because you've only got a fixed time to reach the next section. The countdown timer on the left of the display shows how long you have remaining. When it hits zero you've failed.

In addition to being a great game with really good graphics the program has a few other refinements. For example there is a choice of three steering control envelopes so you can choose the one which best suits your joystick.

With the standard Atari joystick I found the lightest control gave me the better chance of avoiding the obstacles.

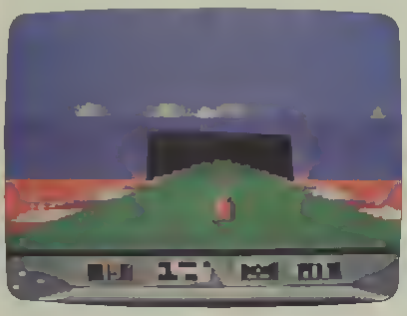
Then there's the three tracks to choose from. Britain, America or Australia. The tracks may not seem all that different in play but it's lovely the way the shape changes as you select each track from the option screen.

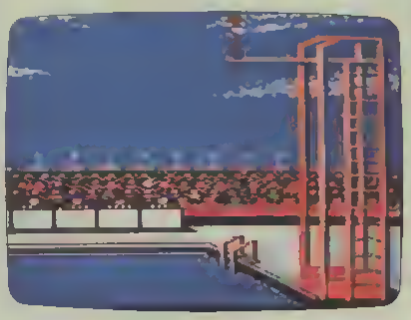
You don't have to steer round the bends but there's enough to worry about without that. Of course you do have to steer at fork junctions and there are bends in the tunnels too.

All in all, Elektraglide is frantic arcade action which demonstrates the real power of the 8 bit Atari. English Software should have another winner on their hands with this one.

The 48k cassette costs £8.95, the disc version £12.95.

Pat Cookson





A lot of bugs this summer

IF my life depended on saying something good about **Summer Games** from US Gold I'd probably have to admit that it enabled me to do things I've never done before.

Like swimming through concrete.

It's rare that a program makes it to market with so many features. You might be even more surprised when I tell you that I saw a pre-release version of the package and told US Gold about the bugs.

One or two minor ones have been removed but the vast majority have been left in on the grounds that they appear in the original American version.

Swimming through concrete is just one of the delightful possibilities. If your opponent establishes sufficient lead over you in the 100m freestyle you can be forced to swim a whole length backwards. Now that's what I call freestyle.

In the swimming relay when one swimmer turns the other does too, even if he hasn't reached the end of the pool yet. The same goes for the hand-over – it's a case of one in all in.

Mind you it might as well be like that because you can't tell who's who anyway.

So the swimming's not too good, how about the running? Well in the 100m dash the screen scrolled forward so that neither player was on screen. It's pretty silly going through all the running actions when you can't see the runner.

Even the general organisation of the program is awful. Despite the two joystick option if the event involves one player at a time then all players must use joystick 1.

What's the point of having two joysticks – and telling the program about it – if you've still got to pass joystick 1 around?

There's also far too much disc-flipping to make for comfortable play. The program occupies two sides of the disc and frequently seems to need something on the other side – no matter which side it's reading at the time.

I could continue in the same vein but why bother? As a famous Australian wine critic once said: This is one for laying down and avoiding.

Cliff McKnight

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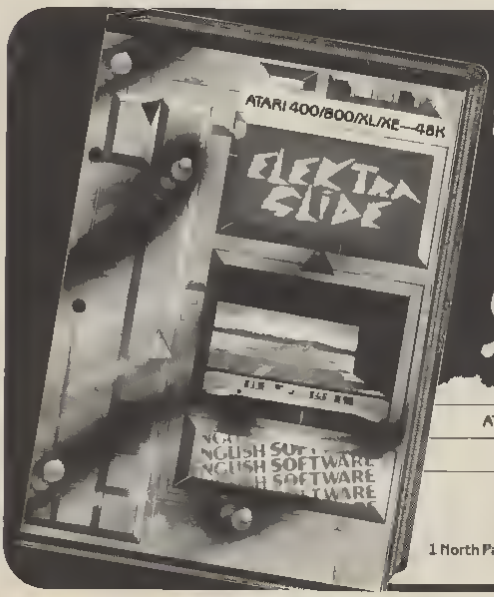

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BASIC LISTER

Display Basic statements in a controlled and tidy manner with this useful utility

By ALAN PUFFETT

SO far as the user is concerned, the Basic listing facilities provided by Atari leave a lot to be desired

If for example you don't know which program lines you want to examine than you enter LIST and stop scrolling by keying either Control-1 or Break

However getting the timing right – for instance to display the whole of a subroutine – can be quite difficult If you do know approximately which lines you want then you can enter LIST lo num hi num but if the lines are not consecutively numbered or occupy more than one physical line then the particular ones you want may get pushed off the top of the screen

In addition after each LIST operation Basic throws a blank line and displays a READY message all of which wastes valuable screen space

This latter feature is particularly annoying if you are attempting to display several separate sections of code at the same time For example you may wish to display program lines around a GOTO as well as those around its destination

This Lister utility is intended to overcome all this and enable the user to display Basic statements in a controlled and tidy manner It achieves this by combining line by line scrolling with the option to jump to any line number as well as suppressing those blank lines and READY messages

Another useful feature is that it can be made to operate on a window of line numbers as defined by the variables LO and HI This enables it to ignore the presence of Basic utilities say Lister itself TYPO etc and allows you to concentrate on the target program

When screen editing is required Lister must be suspended However this can be done in a tidy manner with the option to re-display just the current line or update the screen when resuming

Operation is simplicity itself Merely enter RUN at which an introductory message and the first line in the window will be displayed Each subsequent press of the return key causes the next line to be displayed

Alternatively entering a line number within the range of the window causes that line or the next highest to be displayed

Entries are not echoed to the screen, but since entry is foolproof this is not considered a serious defect. In fact any entry which is not either a number within the window or 0 or –1 is ignored and only results in the display of the next line When the end of the window or the last statement is reached the next press of Return will cause display to return to the start of the window

If you want to edit then 0 or –1 should be entered This will result in Lister being suspended and the screen editor enabled The target program may then be modified and run (by GOTO nnn) if required

So long as no other program has been run since Lister was suspended it can be resumed by entering CONT otherwise it will have to be run again

To assist in resumption CONT is displayed above the STOPPED AT LINE message, so that it is only necessary to place the cursor against this and press Return Of course it will have to be re entered if it has been pushed off the screen by editing

If Lister was suspended by entering 0 then when resumed the current line will be displayed otherwise if –1 was used then the window will be listed up to the current line

There are few limitations involved in the program s use The main ones are that it should be recorded in LIST C/D format so that it can be merged with programs in SAVE or CSAVE format and that the target program may need re-numbering Since however renumbering is such a general requirement it is probably well worth acquiring a suitable utility

When wishing to record a program

VARIABLES

- **HI** First line beyond display window (set in line 1)
- **LIN** Required line number
- **LO** Start line for display window (set in line 1)
- **NUM** Line number from statement table
- **T&L** Address of start of line in statement table

you may not want to have Lister included and dec de to delete it if you have a machine fitted with the early version of Atari Basic make sure that you delete lines in reverse order This simple trick will save you from losing everything

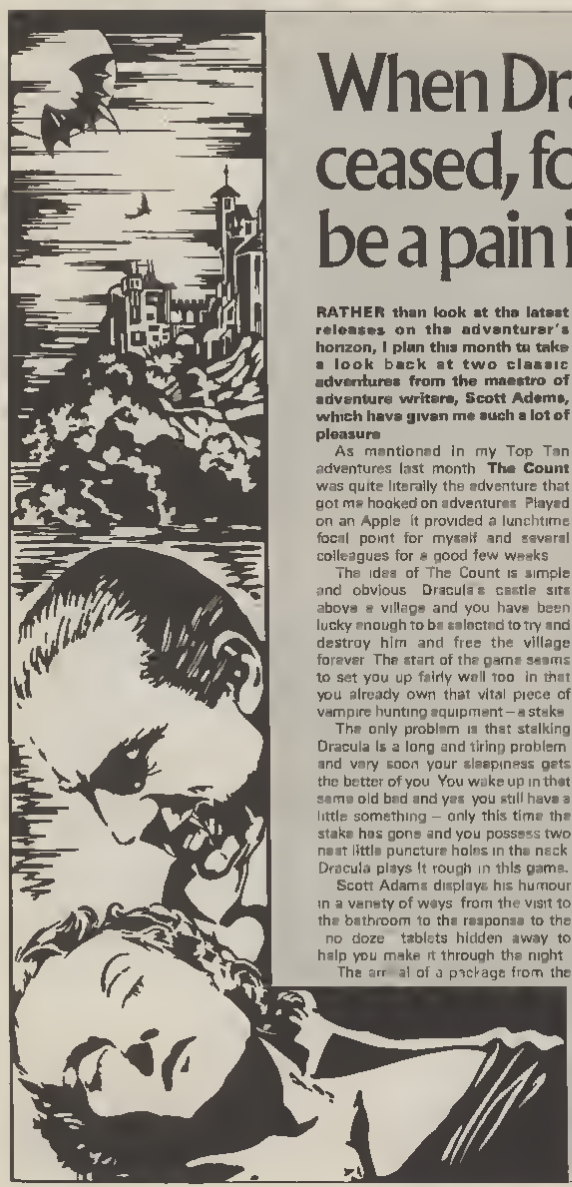
If by some mischance Lister does misbehave simply press Reset and start again

The program occupies less than 800 bytes without REM statements

Get it right!

```
LINE CHSUM  LINE CHSUM  LINE CHSUM
  2   871     3   871     4 18686
  5 21661     6 24933     7 13891
  8  7115     9 14886    10 10453
 11 10888    12 17897    13 13038
 14 12514    15 10853    16 13059
 17  7929    18 11185    19 15033
 20  1648    21 13288    22 12878
 23   838
```

```
2 REM
3 REM
4 CLR :LO=1:HI=31767 GRAPHICS 0:OPEN #
4,4,0,"E:":LIO=LO:? "BASIC Lister,line
nos )=";LO," & (";HI
5 ? "Enter line no and/or RETN":? "D/
L to del,CONT to resume":IF LO<1 OR H
I>32767 OR HI<LO THEN ? "Window":END
6 TBL=PEEK(136)+PEEK(137)*256:IF LIN(L
O THEN LIN=LO:REM Address of statement
 table,reset required line no.
7 NUM=PEEK(TBL)+PEEK(TBL+1)*256:REM Re
cover line no from table.
8 IF NUM=0 THEN ? "Delete line ";LIN
9 IF LIN=LO AND NUM=HI THEN ? "Be pro
gram! load under EDITOR" END
10 IF NUM>=HI THEN LIN=LO :GOTO 6:REM E
nd of window.
11 IF NUM<LIN THEN 21:REM Want higher
line no
12 LIST NUM:LIN=NUM+1:REM List current
 line,increment required line no.
13 TRAP 99:? "99","NUMBER 84,LIN:GOSUB 2
2:REM Trap if not numeric.
14 IF LIN>32 OR LIN<-1 THEN LIN=NUM+1:
REM Input out of range
15 IF LIN>NUM THEN 21:REM Want higher
line no
16 IF LIN>0 THEN 0:REM Want lower line
 no,go back to start
17 ? :? "CONT";:STOP :REM Only 0 & -1
left
18 IF LIN=-1 THEN ? :LIST LO,NUM-1:REM
 Update screen
19 LIN=NUM:GOSUB 22:GOSUB 21:GOTO 6:RE
M Was 0 only list current line.
20 GOSUB 22
21 TBL=PEEK(TBL+2):GOTO 7:REM Find
 start of next line
22 POKE 84,PEEK(84)-1:RETURN :REM Back
 up one row on screen.
23 END
```



When Dracula ceased, for me, to be a pain in the neck

By Brillig

RATHER than look at the latest releases on the adventurer's horizon, I plan this month to take a look back at two classic adventures from the maestro of adventure writers, Scott Adams, which have given me such a lot of pleasure

As mentioned in my Top Ten adventures last month **The Count** was quite literally the adventure that got me hooked on adventures. Played on an Apple it provided a lunchtime focal point for myself and several colleagues for a good few weeks.

The idea of The Count is simple and obvious. Dracula's castle sits above a village and you have been lucky enough to be selected to try and destroy him and free the village forever. The start of the game seems to set you up fairly well too in that you already own that vital piece of vampire hunting equipment – a stake.

The only problem is that stalking Dracula is a long and tiring problem and very soon your sleepiness gets the better of you. You wake up in that same old bed and yes you still have a little something – only this time the stake has gone and you possess two neat little puncture holes in the neck. Dracula plays it rough in this game.

Scott Adams displays his humour in a variety of ways from the visit to the bathroom to the response to the no doze tablets hidden away to help you make it through the night.

The arrival of a package from the postmaster offers more than is first imagined as the paper clip provides a very useful aid when your more nefarious skills come to the fore. The kitchen supplies the statutory garlic to ward off the pesky bat forever buzzing around your ears.

The whole essence of The Count is that you have to acquire items in the correct sequence and the wandering around intent on doing this can prove frustrating until the successive pennies drop. There is a mite more atmosphere in this game than some of the early Adams efforts possibly because of the legend of Dracula being such a familiar story.

My fondest memory of it is of the moment of realisation of the solution which had been troubling me for a fortnight. I think it was when I realised that I was an adventurer first and foremost. It comes to us all in time.

Mystery Fun House is another early Adams game which develops an adventurer's senses and sensibilities. You are a secret agent sent to investigate a fun house to rescue blueprints (shades of Circus from Channel 8 here). Unlike Roger Moore or Sean Connery however you have very limited resources so much so that your first attempt to gain admittance will get you thrown out on your ear still wincing at the pun that accompanies you.

With a bit of adventuring ingenuity you can find enough cash to get into the house having to hang on to your ticket to appease the bouncer and you can begin to explore the complex.

Weird goggles a trampoline and a rapidly spinning calliope conspire to confuse and compound the problems

Eventually by springing into action and remembering the words of a rather English song all the pieces should be falling into place especially since you should have been kind to the mermaid by now

Eventually your search should take you back to square one for an explosive finish – indeed if you have not taken the necessary precautions more explosive than you might have wished

Mystery Fun House proves that it pays to examine everything, from a variety of angles and with a degree of imagination Adventurers have to learn that not everything is as it seems and that objects have more than one use Fun House is an excellent introduction to the deviousness of mind required to succeed

Now a word about the new Level 9 adventure system It sounds quite a feat of programming to get a multi-tasking adventure system – with complex sentence analyser graphics the usual huge spread of locations and at last proper type ahead facility to save tedious wasting time when heading across already explored terrain – in to a cassette based adventure

I've seen one interview which says level 9 are going Infocom hunting A laudable objective and this can only be good for adventurers the world over I shall be reviewing the **Worm in Paradise**, the first game to use the new system in next month's issue

Speaking of Level 9 I see I have been taken to task in Nugget the Norwich User Group megazine both for my failing to like Red Moon and also the heinous sin of publishing the Babel Fish Solution from Hitch Hiker's Guide

Well to be fair I did tell anyone who was reading in sequence that I was about to do exactly that and that if they wished to avoid the answer then they should jump to the next section Presumably therefore only those people who wanted to know the answer then proceeded to read it (and the solution was the answer to a desperate plea from many people)

Of course some people who are less strong willed or who were seduced by my writing style may also have read on but I think they would be the minority – especially the latter However if anyone was unwittingly informed I apologise Perhaps you could write in and suggest ways of solving the problem of passing on hints Cryptic comments or a code? You tell me

On the part of Red Moon and the Nugget assertion that they don't knock a damn good game then that is their opinion and mine remains as published I'm sorry if L of Nugget didn't like it but if we all liked the same things then it would be a pretty boring world

Level 9 are the premier British adventure writers at present That does not mean everyone has to like everything they do In the case of Red Moon I disliked the combat system and found that the graphics were pretty but unatmospheric It's my opinion Feel free to differ

Next month as mentioned I'll look at **The Worm in Paradise** and also **Asylum** Note that they both have graphics My New Year's resolution is holding up so far!

GLITCH of the Month comes from Andrew Lord of Benfleet in Essex He has found an amazingly persistent guard in The Pay-Off, from Atari/Signose Software When he drugs the guard, he can drag him all over the place, even down into the festering sewage in the town centre.

Return to the desk in the bank and try to take the coffee from it and immediately the guard awakens and hastens back to arrest you. A T-shirt on its way to you Andrew, and try not to be so light-fingered.

If you haven't got the gem yet, try going downstairs and through the chamber. If you cannot get through the chamber then you need to examine an office a little more carefully.

C THROUGH A WINDOW

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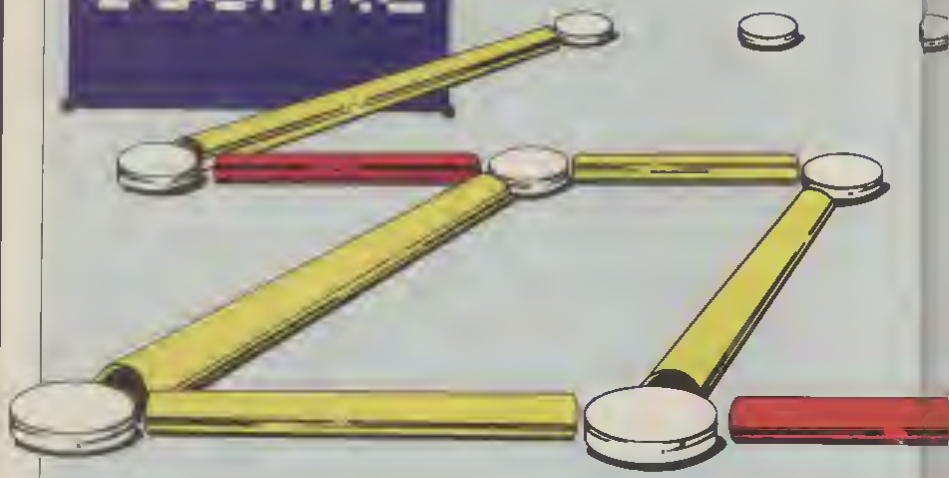
DOTS SQUARE

SOL GUBER presents a micro version of the logic gsma which devalops a player's ability to plan ahead



THE Atari can be used as a very good teaching tool, but it can also remove the drudgery of playing games

A very good paper and pencil game of logic is called Dots where the object is to teach the ability to look ahead at moves

The game is quite simple A grid of dots is placed on a piece of paper and each person in turn draws a line from one dot to a neighbouring dot The lines must be in horizontal or vertical direction – no diagonal lines are allowed

The person who drews the last line of a square is allowed to put his initial into it and take another turn The person with the most squares is the winner

This version is very similar Instead of paper and pencil we now have a screen and two joysticks The program starts by asking if instructions are wanted A Y or N answer is needed

It then asks the names of the two players The names are entered into the micro and Return is pressed The first initial will be used to fill the squares as they are won The two players can have the same first initial since they will have different colours for the squares Two joysticks are needed – slot 1 for player 1 and slot 2 for player 2 Each player will know when it is his turn because his name will be seen on the bottom of the screen with the score

Using the joystick each player moves a circle on the screen from one dot to another The circle cursor will not wrap around the screen nor will it move over the edge When the cursor is over the dot for the first part of the line the player presses the trigger and a beep is heard The joystick is then moved to the spot for the other end of the line and again the trigger is pressed Again a beep

If it is a legal move a line is drawn on the screen If the ends of the line are not neighbouring dots or are not vertical or horizontal there s a beep If the line has already been drawn again a beep is heard If the line completes a square, the person s initial is put on the screen

There is an option for one player versus the Atari At the start the names of two players are entered If one of the names is COMPUTER then the computer will play A question about the level of play is then asked

The micro will play at five different levels of difficulty from 1 to 5 At level 1 most young children will be able to beat the

How it's done...

THE programming of Dots Square is straightforward but let's look at how one makes a computer into a good opponent. First consider data storage.

In the Atari there are two kinds of variables: string and numeric. Numeric variables do not end in $ and take six memory bytes for each number.

String variables take only one byte and can have a value of 0-255 in each byte which corresponds to a letter.

So for numbers between 0-255 string variables use much less memory and the numbers are stored one after another rather than every six. The translation is also easier.

Now people can look at data and see patterns easily. Computers need to be taught how to look for patterns so the data must be in a simple – to a computer – form.

The computer will always win if it is allowed to look long enough or hard enough so there must be some way of handicapping it. The two main methods are by use of a time limit or a logic scheme that causes the Atari to play differently depending on the level.

The algorithm for the computer version takes much credit from the ideas of Chris Crawford on how a game should be made. The object of Dots Square is to win the most squares by completing the side of a square. If you win a square you get another turn so that a complete turn can win many squares.

The logic of the game is equally simple. If there is a square with three sides completed then complete the fourth side and win it. If there are no such squares then make a line between two dots so that your opponent will not be able to complete a square on his next turn.

If this is not possible then make a move that will give your opponent the fewest squares as he makes his move. The computer plays the same way.

When the computer plays it must be able to look at the board and see as a human would. It must be able to see squares that have all four sides completed, three sides completed and so on. To do this there must be a simple way to represent the data.

Since the computer uses binary notation it was decided to use a variable B$ which contains 100 cells each cell corresponding to one of the squares of the board.

Each cell contains information about the lines around that cell. The top side is 1, the right side is 2, the bottom side is 4 and the left side is 8.

So if a cell has all four sides around it, the value in the cell is the sum of the sides or 15 – 00001111 in binary.

Thus if a cell contains 15 it is filled and cannot be used. If a cell contains 0 there are no lines around it. From the other possibilities between 0 and 15 the computer can see what the board looks like.

For the computer to play a fast game it must scan the board quickly and a machine language subroutine is

computer but at level 5 it will play a very good game.

When the computer plays the human uses joystick 1. While the computer thinks of a move it makes sounds to annoy its opponent.

A demonstration mode is also available. Since the system checks only the first seven letters in the name, COMPUTER1 can play COMPUTER2. The C initial will be a different colour for each of the players. The computer will then play itself at any level desired.

The demo mode game lasts less than five minutes. Each of the players will move the circle cursor to where it wants to make its move and then a line will be drawn on one side of that square. It is very interesting to see the two computers battle it out.

used The subroutine has three parts it starts at a given cell in variable RS and looks forward through it

The second part tells the subroutine how many sides in the cell to look for It can look for cells with one two or three sides completed To look for cells with one side completed it looks for the binary pattern 00001000 00000100 00000010 or 00000001 If the search is successful then that cell number is returned from the subroutine

If the search is unsuccessful than a 0 is returned

Now that the computer can see the board it must have a routine to find moves The first thing it does is check for cells with three sides completed It uses the search subroutine starts with the first cell and checks for all patterns that have three sides completed

If it finds one the Atari makes that move and goes through the search again If it does not find a three than it makes a move and this is where the different levels of play come in

Chris Crawford believes that there should not be discrete difficulty levels in computer games It should play at various levels in different parts of a game

The computer should not spend a lot of time on the opening moves when there are a great many possible moves When the possibilities have become more limited than the best move can be determined

An example of this is seen in one of the old chess computers where the various difficulty levels were determined by the time you allowed the computer to think of its next move

The easy level used two minutes thinking time and the most difficult level could take up to 24 hours

If the 24 hour mode was set it would think for 24 hours for the first move and for every move after that When there were only 5 to 10 men left in an end game the moves would speed up

This type of play is not very good when used for logical games In Dots Square there are five levels of play but the computer will play in several levels during a game depending on both the score and the maximum level that it is supposed to play at

In the higher levels it will play a better game as the score increases so it will not spend the maximum amount of time thinking about the first move when there are 50 possible good first moves

Towards the end of the game when the moves become more significant the best move will be determined

Let s look at the different levels of play At level 1 the computer makes a move at random It picks a square and then picks a side to put a line on No checking is done of any sort

In level 2 it picks a square at random and checks to see if the square contains either 1 line or no line in it If it does then this is the move

If it does not then it picks another square at random It does this five times and if it cannot find a move then it goes to level 1 for the move and picks a square at random

Level 3 is a little more sophisticated It looks for a random square that has one or no sides completed but it does this 10 times

If it finds one it picks a side to complete It then checks to see if it will make a three-sided square on the adjacent square and if it will then that square is rejected If it cannot find a good move in 10 tries it reverts to level 2 and looks for a move

If it cannot find a move on that level then it reverts to level 1 where it will always find a move

Level 4 does not make random moves It searches the whole board for squares that contain no sides and then for the squares that contain only one line It checks to see that no three-sided squares are made

If it cannot find a one or no-sided square it picks a two sided square to complete at random

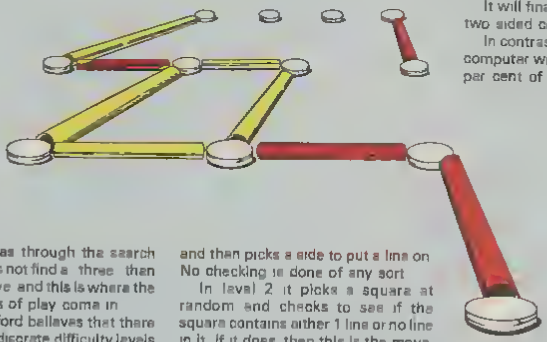
Level 5 is the same as level 4 but this time it looks at 10 different two-sided squares and picks the one that will give the least number of points to the opponent

The computer plays according to the level the human selects and the number of squares that have been won For play at level 5 it starts out at level 3 and picks good empty cells or those with one side completed

If it cannot find one it will revert to level 2 After two cells have been won then it plays a good game to find the cells that will not give the opponent a good move

It will finally check to find the best two sided cell move

In contrast if level 1 is selected the computer will play at random until 90 per cent of the cells are completed



and then will try to pick better moves if possible

With level 2 the random moves are only until 10 per cent of the cells are completed which gives the computer a better chance to win

In level 4 the game starts in level 2 and progresses to level 4 at the end In effect the overlap is such that it is difficult to determine exactly the strategy of the computer until most of the game is over This way it seems more like a human opponent

At the beginning of a game it will be careless and let the human win a little to throw him off balance It will play better as the end game starts

→

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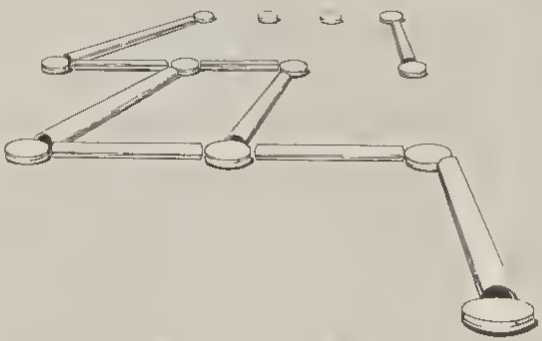
```
1 DIM B$(5E$(61)),OB$(22),P0T(16)
2 C1=1 C0=0:C2=2 C3 C2*C1 C4=C2*C2 C5
5*C2=C4+C2 C7=C5+C2 C8=C4+C4 C9 C4+C1:
C10=C2*C0 C15=C10+C5 C14=C15-C1
5 DIM PLOYER$(20),A$(10),XOIF(15),Y0IF
(15),PLAYER$(C1) " ":PLOYE0$(20)," ":P
LOYE0$(C2):PLOYE0$
7 GOSUB 5000
8 ? "A ":OAP 0,? "DO YOU NEED INSTRUCT
IONS",:INPUT B$:IF B$(1,1)="Y" THEN GO
SUB 3000
9 ?:OAP 40000
10 GOSUB 1000:SC(1)=0:SC(0)=0
15 POKE 53276,10
20 OOK=C0
30 FOR I C0 10 C1 FLG=C0:POKE 77,0:OFL
G C0
40 ? "WITHOU FOR ",PLAYER$(10*C1,10*I
*C10)," " PLOYERS(C1-C0):WIDH+1,EF=
C0:WC(0*C10)
48 ? "SCORE - ";SC(I),"
";SC(I-C0):IF PLAYER$(10*C1,C1)=PY+
C4)="COMP" THEN GOTO 8000
50 S=STICK(I):IF CFLOG=C1 THEN S=STICK
(C0)
52 IF S=STR$(X):IF CFLAG=C1 THEN 10=510
I(C0)
53 IF T0=C0 AND FLG()C1 THEN FLG=C1:XP
1=XP05:YP1 YP05 COLOR 0 PLOT EXP1-1:P1
5+10,(YP1-1)*0+1 GOSUB 500:GOTO 58
55 IF I# C0 AND FLG=C1 THEN 115
58 IF S=15 THEN POKE 708,170 0=I+A*1:P
OKE 708,12 0=I+A*1 GOTO 58
60 XI=X+XOIF(S)*15:YI=Y+Y0IF(S)*10
61 IF XI(50 OR XI)199 THEN XI N-XOIF(S
)*15:GOTO 58
65 IF YI(XI 00 YI)170 THEN YI Y-X0IF(S
)*10 GOTO 58
68 XP05=XP05+XOIF(S):IF XP05=0 THEO XP
05=I
69 YP05 YP05+Y0IF(S) IF YP05 0 THEN YP
05-(
70 IF XOIF(S)()C0 THEN FOR 0 X 10 XI S
IEP XOIF(S):P0-05 POKE X00,0:NEXI 0
80 IF Y0IF(S)()C0 THEO FOO 0-Y TO YI S
IEP Y0IF(S):P0-S:B05E$(0,0+17)-00T$ OEX
I 0
81 X=XI:Y=YI
90 FOR 0=I TO 100 NEXT 0:GOTO 50
96 IF FLG=C1 THEN 115
100 HZ=X Y2=Y FLG=C1
105 GOTO 50
110 GOSUB 050
110 H=HI.Y-YI OLDX=XP05*OLDY=YP05
120 SOUND C0,C0,C0,C0
122 IF XP05=XPI 000 005(YPI-YP05)-1 TH
C0 300
125 IF YP05=YPI 000 005(XPI 0P05)=X IN
C0 000
130 COLOR 1:PLOI (XP1-13*I5+10,(YP1-I)
0*1
135 ? "ILLEGAL MOVE - TRY AGAIN" FOR
WAIT=I TO 500 NERT WOIF GOSUB 520
140 FLG C0 GOTO 40
150 ? "THIS S'HE WAY ALREADY BEEN TRA
KN" FOR WOIT 1 TO 500 NEXT WAIT GOSUB
500
155 COLOR 1 PLOI (XP1-(1)*15+10,(YP1-1)
*0+1
160 GOTO 140
200 LOCAIE (XP05 15*15+10 SGN(XP05-XP1
205 (Y01-1)*0+1 2 IF Z()0 INEO 150
206 COLOR [.PLOI (XP05 11*15+10,(YP05-
1)*0+1 0RAWTO (XP1 15*15+10,(YP1 1)*0+
1
205 B1 YP05*10+XP05 02 YP1*10+XP1
210 IF 01)02 THEN 01 02
215 S01-01-10:S02-S01-10
220 IF S01(0 INEN S01=0:GOTO 230
221 IF S01)99 THEN S02=0 GOTO 230
225 IF S02(0 INEO S02=0 GOTO 230
226 IF S01)39 THEN S01=0 GOTO 230
230 IF S01)0 IOEN B$(S01,S01)=CHO$(ASC
(B$(S01))+1)
235 IF S02)0 INEN B$(S02,S02) CHR$(ASC
(B$(S02))+1)
240 IF S01)0 IOEN IF ASC(B$(S01))=10 1
NEN 51 S01 GOSUB 2000 SC(I)=SC(I)+1
245 IF S02)0 THEN IF ASC(B$(S02))=15 T
HEN 51=S02:GOSUB 2000 SC(I)=SC(I)+1
250 FLG=C0
255 IF SC(C0)+SC(C1)=01 INEO 2200
260 IF 0FLG=1 THEO 0FLG=0 GOTO 40
290 GOTO 400
300 LOCAIE (XP05 11*15+10 (YP1-1)*0+1-
SC0(YP1-YP05)*5,2 IF Z()0 YMEN 150
303 COLOR 1 PLOI (XP05-(3*15+10,(YP05
13*0+1 00AWTO (XP1-(3*15+10,(YP1 13*0+
1
305 01=YP05*10+XP05 02-YP1*10+XP1
310 IF 01(02 THEN 01-02
315 S01-01-20 S02 S01-1
320 IF INT(S02/10)=S02/10 IHEN S02=0 G
OTO 330
325 IF INT(S01/10)=S01/10 THEN S01=0 G
OTO 330
330 IF S01)0 THEO B$(S01,S01)=CHO$(ASC
(B$(S01))+0)
335 IF S02)0 INEN B$(S02,S02)=CHR$(ASC
(B$(S02))+2)
340 GOTO 240
400 K005=RLOU YP05=OLDY
420 OEXT I
440 GOTO 10
500 SOUND 0,150,10,8 FOO I9=I TO 75 OP
XT I9 SOUND 0,0,0,0 OETUON
520 SOUND 0,76,12,8 FOO I9 1 IO 20 NEX
T I9:SOUND 0,0,0,0 RETUOO
500 SOUND 0,100,10,0 FOO I9=I TO 25 NE
XI I9 SOUND 0 0,0,0 OETUOO
500 SOUND 0 25,12,8 FOR I9=I TO 20 NEX
T I9 SOUND 0,0,0,0 RETUOO
999 STOP
1000 GOSUB 4000
1100 POKE 752 I.POKE 764,255
1200 ? "PLAYED 1 - ENIER YOUR OAME" IO
PUT B$:IF LEO(A$)=C0 INEO 1200
1206 PLOYER$(1,LEO(B$)) B$ I C0:GOSUB
1000
1210 ? "APLAYED 2 - ENIER YOUO BAME" I
OPUT B$ IF LEN(B$)=C0 INEO 1210
1215 PLOYER$(11,10+LEO(B$)) B$ I=C1:GO
SUB 1000
1210 IF PLOYER$(C1,4) "COMP" OO PLOYER$
(11,14)="COMP" THEO CFLOG-C1 GOSUB 700
0
1220 XOIF(C5)=C1 YOIF(C5)=C1
1230 XOIF(C6)=C1 YOIF(C0)= C1
1240 XOIF(C7)=C1 YOIF(C7)=C0
1250 XOIF(C9) -C1 YOIF(C9) C1
1260 XOIF(C10)= C1 YOIF(C10)= C1
1270 XOIF(11)=-C1 YOIF(11)=C0
1280 XOIF(13)=C0 YOIF(13)=C1
1290 XOIF(14) C0;YOIF(14) -C1
1300 XOIF(15)=C0 YOIF(15)-C0
1305 005E$(C1) "0" 005E$(512) "0":B05E
5(C2) B05E$
1310 X $6 Y 27
1320 RESIOOE 1240 XI=C0
1330 XI XI+1 NEOO 0 IF A()-1 TOEN 00T$
(X) X15-CHO$(0) GOTO 1330
1340 DOIO 0,0,0,0,0,0,40 72,1E2,132,1E2,
72,40 0,0,0,0,0,0, 1
1350 POKE 559,62 POKE 704,90
1360 [ PEEE(106)-32 POKE 54279,I
1370 POKE 53277,I 0100-PEER(1241+256*P
EE(1235)
1380 AT00=PEEE(140)+256*PEEE(141)
1390 OEFS I=1500*1024 0100
1400 MI INI(0FFS/2561 L0=0FFS-MI*256 P
OKE V1A0+2 L0 POKE UT00+I,MI
1410 000-53240 POKE 53248 56
1415 FOO K-1 10 256 51EP 8 005E$(K,K+1
7) 00T$ NEXI 0
1420 005E$(27,44)=00T$
1440 XP05 C1 YP05 C1:0LOK=C1 0LOY=C1
1500 RETUOO
1500 K-05CE(PLOYER0(I00(1)*C1)):K=K-3I
1505 10=57144+8*K*C1
1510 F00 J-C0 TO C7 POTE(J+I*C7)-PEEK(I
00)I OEXT J
1530 RE1UR0
2000 0FLG-C1
2010 X4 INT(S7/C10):Y4=S7 X4*C10 X4-X4
*C0*C2 Y4-Y4*C15 S4:C0E00 I*C2
2020 F00 JI=C0 I0 C6
2030 0Z=P0TE(T*C7+J1):SOUNU C0,RZ,CI0,C
I0
2035 F00 J2-C1 I0 C1I STEP CZ
2240 IF RZ/GZ()I01(0Z/C2) THEN PLOT Y6
+C14 JZ,X4+J1 PLOT Y4*C1I-JI,R4+0JI
2045 R2 INT(RZ/CI) OEXT JZ OERT J1
2050 SOUND C0,C0,C0,C0
2090 RE1UOO
2100 I=0:IF SC(I)>SC(0) THEO I=I
2105 ? "TRE WINOER IS " PLOYE0$(I*10+1
,I*10+10)
2210 ? "WITH ",SC(I),' SQUARES"
2220 FOO I=I TO 255 STEP 0 SIXI4 POKE
712,I SOUND 0,256-I 10,8 NEXI I
2225 SOU00 0,0,0,0
2230 ? "ORO!HEO GOME"; IOPUT A$ IF A$=
"" THEN 05II,I3 "N"
2235 FOO 0-170 10 C1 STEP C8 005E$(0,
0+17)=00T$ NEXI 0
2237 IF A$(1,1)()"Y" THEO GOOPHICS 0:E
ND
2240 OUN
3000 TOAP 40000 GOOPHICS 0:SETCOLOO 1,
0,0 SETCOLOO 2,11,6 SETCOLOO 4 II,5 PO
KE 752,I
3002 ? "A" ? "INTS GAOE IS PLAYED OY T
OO PEOPLE WHO TOKE TURNS DRAWING O
LINE BETWEEN TOO OOTS "
3010 T "OOER O SQUOOE IS COMPLETED, IH
```

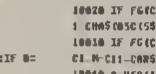
```
E       INITIAL OF THE PERSON WHO DREW
 THE"
1015 ? "LAST LINE IS PLACED IN IT "
1020 ? "HE OR SHE CAN THEN TAKE ANOTHE
R TURN  THE PERSON WITH THE MOST SQUARE
ES WINS "
1030 ? "AT THE PLAYER WHOSE GAME IS DISP
LAYED ON THE SCREEN TAKES A TURN.   MOV
ING THE"
1040 ? "JOYSTICK WILL PLACE THE INDICA
TOR ON  THE SCREEN AT THE POSITION ORE
WISHES"
1050 ? "TO START MOVING THE LINE   THE
 FIRE-  BUTTON IS THEN PRESSED   THE P
ROCESS"
1060 ? "IS REPEATED TO SIGNIFY THE END
 OF THE LINE  TIME COMPUTER WILL DRAW
THE LINE"
1070 ? "AUTOMATICALLY 1 DON'T MIND IF
 YOUR   ADVERSARY HAS THE SAME INITIAL
 S YOU "
1075 ? "AS EACH PLAYER WILL MOVE A DI
FFERENT  COLOR INITIAL PLACED IN HIS/R
EQ ARN "
1077 POKE 764 255
1080 POSITION 6 21 ? "PRESS ANY KEY T
O CONTINUE "
1085 IF PEEK(764)=255 THEN 1085
1090 ? "G" ? "THERE IS THE OPTION TO P
LAY AGAINST   THE COMPUTER   WHEN THE
GAMES OF TWE"
1100 ? "PLAYERS ARE ENTERED.  SIMPLY TY
PE    "COMPUTER" AS PLAYER #1 OR PLA
YER #2 "
1110 ? "THE COMPUTER WILL TAKE ITS TWO
N       AUTOMATICALLY " ? "THE COMPUTE
R IS QUITE TO PLAY A GAME
1130 ? "AT FIVE DIFFERENT LEVELS   LEV
EL ONE  IS THE EASIEST  WHILE LEVEL FI
VE IS   THE MOST DIFFICULT "
1140 ? "IN ADDITION  THERE IS OLSO A G
AME      MODE   SIMPLY NAME THE TWO PLA
YERS    "COMPUTER1" AND "COMPUTER2" "
1145 ? "ONE HAVE FOR WATCHING THE COMP
UTER      PLAY AGAINST ITSELF!"
1148 ? "OF COURSE  THIS COMPUTER RUNS
WHEN IT ISNORS  AND WE HOPE YOU WON'T
BE
1150 ? "ANNOYED WHEN YOU HEAR ALL THE
SOUNDS  IT MAKES AS IT CONCENTRATES "
1155 POKE 764 255
1160 POSITION 6,22 ? "PRESS ANY KEY T
O CONTINUE"
1165 IF PEEK(764)=255 THEN 1165
1170 POKE 764,269 DE1000
4000 GRAPHICS 7 POKE 708,94:POKE 709,5
9 POKE 709,0 POKE 710,168 POKE 712,102
:POKE 559,14
4005 COLOR C1:FOR I=1 TO 91 STEP 6
4010 FOR J=10 TO 146 STEP 15
4020 PLOT J,I-C1:PLOT J-C1,I:PLOT J,I.
PLOT J+C1 I:PLOT J,14C1
4030 NEXT J NEXT I RETURN
5000 GOSUB 4000 I C0 RESTORE 5100
5010 FOR P=C1 TO 15 CHECK 1 READ A,Y.P
LOT A,Y
5020 DRAWTO X+C15,Y DRAWTO X+C15 Y+CA
DRAWTO X,Y+C0 DRAWTO X,Y
5025 IF P=10 THEN I=C1
```



```
5030 READ K,ST:GOSUB 1005 GOSUB 2000
5040 NEXT P
5050 FOR P=1 TO 300 NEXT P
5060 RETURN
5100 DATA 48,1,36,1,48,9,47,15,48,17,5
2 11,40,25,51,33
5110 DATA 55,25 49,34,70,25,53,35,05,2
5,33,38,100,25,58,37,116,25,17,38
5120 DATA 100,41,90,57,115,41,121,60,0
5,45,51,66,100,45,47 07,115 49,44,69
5130 DATA 70,57 59,75,85,57,53 76,100,
57 14,77 115,57,37,78,110,57,50,79
7000 DIM A$(45),S$(25),T0(C10) FOR
C41
7010 A$(45)="%%%%%%%%%%%%%%%%%%%%%%%%
7020 GO SUB 6000:S1
7030 TRAP 7010 ? "SELECT LEVEL OF DI
FFICULTY (1 S)       J VERY EASY  5-MO
IUM  5-VERY HARD"
7035 INPUT A:IF A(1 OR A)5 THEN 7010
7040 OTF-(A-C1)*22:LO4 C14:C0-CS)*22
7045 TRAP 40000
7100 S005:FOR I=16
7200 SOUND 0,I,6
7110 DATA 104,104,133,210,104,133,205,
104
7117 DATA 104,141,55,6,104 104 141,100
7114 DATA 6,169,A1,141,52 6 169,6
7115 DATA 141,53,6,24 206,55,6,240
7118 DATA 10 173,52,6,105,A,141,52
7120 DATA 6,200 241,173,100,0,160,162
7122 DATA 5,177,205,221,81,6,240,16
7124 DATA 202,16,240,200 152,157,101 1
44
7128 DATA 210,105,0,133 112 133,211 96
7130 DATA 200 105,0,133,211,162,133,21
2
7110 DATA 96 1,2 4,0 0 0 3
7117 DATA 5,9,6,10,12,14,13,11
7114 DATA 7 7 7,1 1
7150 RESTORE 7110
7190 FOR X=SUBSTART TO SUBEND
7193 READ Y POKE X,Y NEXT X
7700 RETURN
8000 O=USR(L536 ADR(OS),C1,C0) IF O=C0
 OR O)100 THEN 8100
8010 YP1 INT(C0/1014C1 HP1 O-YP1*C104C1
0
8020 X A$(C0*S(O))1
8025 IF K 7 THEN HP05=XP1*YP05 YP1+C1:
GOTO 12000
8030 IF K-11 THEN HP05=XP1+C1 YP1=YP14
C1 YP05=YP1 GOTO 12000
8035 IF K=13 THEN HP1 XP1+C1 HP05=XP1.
YP05=YP14C1 GOTO 12000
8040 IF K-14 THEN XP05=HP1+C1 YP05=YP1
 GOTO 17000
8100 K=INT(C0)F45C2C0)+SC(C1)1/Z01
8110 OR K4C1 GOTO 0100,0600,9000,9400,
9400 9400
8200 M=A$0(C0)*05+C1 N=INT(M)
8205 SOUND C0,XMC2,C10,C10
8210 K=A5C(C0S(M)) IF K 15 THEN 8200
8220 IF M/C10-INT(M/C10) THEN 8200
8230 A=RNDCC0)*C4 B=ENT(M) M1=(M)C2-N*
0 A51
8240 O=USR(ADR(CHKD$),K,N,M1):IF O()C0 T
HEN 8210
8260 YP1=INT(M/C10)*C1 XP1=M-YP1*C104C
10
8270 OR N*C1 GOTO 8310,8110 8310,8240
8110 HP05=HP14C1-YP05=YP2:GOTO 12000
8120 HP1=XP14C1 N*A05=AP1:YP05=YP14C1 G
OTO 12000
8130 YP1-YP14C1*B*05-XP14C1 YP05=YP1.G
OTO 12000
8140 HP05=XP1 YP05=YP14C1 GOTO 12000
8000 FOR X1 C1 TO 25
8010 M=RND(C0)*B*C1 N=INT(M) IF M/C10
=INT(M/C10) THEN 8010
8012 SOUND C0,XMC2,C10,C10
8015 K=A5C(C0S(M))
8020 IF K=C0 OR K=C1 OR K=C2 OR K=C4 O
R K=C0 THEN 8210
8610 NEXT X1 GOTO 8200
9000 FOR X1=C1 TO 15
9010 M=RND(C0)*B*C1 N=INT(M) IF M/C10
=INT(M/C10) THEN 9010
9013 SOUND C0 XMC2,C10,C10
9015 K=A5C(C0S(M))
9020 IF K=C0 OR K=C1 OR K=C2 OR K=C4 O
R K=C0 THEN 9000
9000 NEXT X1 GOTO 6000
9050 A RNDCC0)*C4 M=INT(M) M1=(M)C2-N*
```

→

```
0 OSI IF OI=X INEW 9050
9050 DLG=C0
9060 ON W=C1 GOSUB 9110,9130,9130,9140
9065 IF OLG=C1 THEN 9010
9070 GOTO 0260
9110 IF W<C10 INEW OE1U00
9112 D=USR(1536,000(RS),C2,W-119: IF O=
W-C10 INEW OLG=C1
9115 RETURN
9120 D=USR(1536,ODR(RS),C2,W):IF O=W<C
I INEW OLG C1
9125 RETURN
9130 D=USR(1536,ODR(RS),C2,W-C29: IF O=
W<C10 THEN OLG=C1
9135 RETURN
9140 IF W<C1 INEW RETUOO
9145 D=USR(1536,OOR(RS) C2,W-C21:IF O=
W-C1 INEW OLG-C1
9150 OEIUOO
9200 FOR X3 C0 TO C2 OLG=C0
9210 IF MOU=INT(CC2*X3+0 05) THEN 9200
9220 ON X3+C1 GOSUB 9110,9120,9130,914
0
9230 IF OLG=C0 THEN OE1000
9200 NEXT X3 RETUOO
9400 FOR N=EL04 TO 90 IF K/C10=INT(K/C1
0) INEO 9429
9405 SOUOO C0,09C2 10,10
9410 M=N IF DSC(RS(EI)+C)C0 TOED 9429
9420 GOSUB 9280
9425 IF OFL=C1 THEN 9429
9428 M=W-LV4=E M=EX:SOTB 0260
9429 OENT B EF4=90
9430 IF EUO3100 INEW 9460
9432 C1=C0 L04=90
9433 O USR(1536,00R(OS),C1,K13 IF B=C0
 INEW 9460
9436 IF B790 INEO 9460
9438 IF B/C10=INT(O/C10) THEN K1=B+C1
GOTO 9435
9439 SOUOO C0,09C2 10,10 M=0
9400 ROU=OSC(OS(0,0)):GOSUB 9200
9445 IF OLG-C1 OR X3=C4 INEW X1 B+C1 G
OTO 9433
9450 M-X3 GOTO 0260
9460 IF O1P7=00 THEN 9000
9061 L05=200
9466 X1 INT(UOO(CO)+M3991)
9470 O USR(1536 000(OS) C2 M1 IF O C0
INEW 9500
9021 IF B)67 INEO 9700
9030 IF P=C10 INEW 9510
9000 IF P=C0 INEW 9000
9050 FOR N1=C0 10 P IF 10(X3) 0 THEN 9
500
9000 OENI X1
9000 10(P1-01)=P+C1
9500 OENT I3 IF P=C0 INEO 9000
9510 P=P-C1 OESI=100
9520 FOR E3=C0 TO P M=TH(E3) OL=C0
9525 IF M>09 INEO 10110
9510 OL=C0 55 05
9540 OL-OSC(SS(M)) S$(M,M)=CHR$(151
9545 FAC C1
9560 SOUOO C0,M*C2,10,10 M=0
9550 FOR J1=C1 TO C0 FGCJ1 C0
9560 D USR(ODR(000051,OL FAC) IF B()F0
C INEW FGCJ1=C1
9570 FAC=FAC*C2 OENI J1
9575 IF W>09 INEO 10130
10000 IF FG(C1) C1 000 M)C10 INEO 55(M
-C10 M-C10) CHR$(OSC(SS(M-C10))+C4)
10010 IF FG(C2) C1 INEW SS(M*C1,M*C10
CHR$(OSC(SS(M*C1)3+C0)
10020 IF FG(C3)-C1 THEN SS(M*C10,M*C10
1 CHR$(OSC(SS(M+C10))+C1)
10010 IF FG(C0) C1 OWO M)C1 INEW SS(M-
C1,M-C11-CHR$(OSC(SS(M-C11)+C2)
10040 O USO(1536 000(SS),C1 C0) IF O=C
0 THEN 10100
10045 IF B)50 INCO 10100
10050 OL-OSC(SS(01):SS(0,0)=CHR$(15) O
L 15-OL:BL OL*C1
10060 IF VL=C0 000 0)C1 THEN SS(0-C1,0
 C1) CHR$(OSC(SS(0 C1))+C2) GOIO 10040
10065 IF VL-C4 INEO SS(BAC10 M+C101-CH
R$(OSC(SS(O+C10)1+C1) GOTO 10040
10070 IF VL=C2 INEW SS(O+C1,0+C1) CHR$
(OSC(SS(O+C1)1+C0) GOJO 10040
10080 IF VL C1 000 0)C10 THEN SS(0-K10
 A C101-CHR$(OSC(SS(O-C10))+C0) GOIO 1
0040
10100 IF BL(OF5) THEN OESI OL:10=C1
10110 OEOT N1
10120 M-10(10) GOIO 0210
12000 E3 (SPOS C11+15+56
12000 IF X=X1 THEO 12020
12010 F00 O-X TO 01 STEP C2*(SGN(X1-X)
) POKE HOR O OEXT O
12020 Y1-(YP05-C1)+16427
12020 IF Y-Y) THEN 12000
12010 FOR O=Y TO Y1 STEP C2*(SGN(Y1-Y)
) 005E5(0,0#17)-0015 OEXT O
12000 O N1 T=Y1 OL04 XP05 OL01-YP05:00
10 120
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	5062	2	10095	5	11112
8	10272	7	1937	8	15314
9	10066	10	6445	50	7245
20	1221	30	7204	40	13866
00	15306	50	7652	52	7510
51	20059	55	5001	50	10010
00	5792	63	6273	66	6281
00	8176	69	8390	70	13243
90	14076	03	7800	70	5547
95	3351	100	3297	105	1424
115	1909	110	6741	120	3015
122	7721	125	7726	130	6435
135	23025	140	2051	150	20505
155	6415	160	1620	200	12323
203	12417	205	5877	210	1271
215	3516	220	5070	223	5607
225	5075	220	5601	230	0200
235	0273	240	12412	245	12442
250	1152	255	5100	260	5601
270	1010	100	12260	100	12417
305	5697	110	3267	315	1672
320	7405	325	7405	330	0267
335	0771	340	1612	000	4707
030	1105	440	1070	500	11240
520	11244	550	11225	560	11115
999	1190	1000	1920	1100	0100
1200	13590	1205	6559	1210	12155
1215	7257	1210	12019	1220	4217
1240	4520	1240	4320	1250	4625
1260	0616	1270	4467	1200	4191
1250	0450	1100	4262	1305	7050
1110	1767	1320	3911	1330	10205
1240	7750	1250	0110	1260	4759
1270	7260	1100	4051	1250	3600
1400	11070	1410	4207	1015	0026
1020	2560	1440	6468	1500	1490
1000	5427	1005	7617	1010	8159
1020	1490	2000	1375	2010	11001
2020	2714	2030	6736	2035	4505
2040	12107	2045	5510	2000	3045
2070	1490	2200	4607	2205	7057
2210	0451	2220	1102	2225	2311
2230	9006	2235	9120	2247	6670
1260	533	3000	14501	3002	15150
3010	14600	3015	5567	3020	16214
3010	15005	3040	16151	3050	15120
3060	16152	3070	15742	3075	14770
3077	2121	3000	15471	3005	4016
3090	16730	3100	15000	3110	10750
3120	10527	3140	20016	3145	11522
3140	14630	3150	16212	2155	2121
3160	15671	3165	6429	3170	4005
4000	14055	4005	5594	4010	1937
4020	10760	4030	4476	5000	5160
5010	7009	5020	11021	5025	3046
5030	6014	5040	11559	5050	13987
5060	1450	5100	7604	5110	10019
5120	10097	5130	10277	7000	5927
7010	6102	7020	2473	7030	16810
7035	5800	7060	5122	7065	1866
7105	7757	7105	2004	7110	6522
7112	5151	7114	4469	7116	4676
7120	4656	7120	5004	7122	4700
7124	5451	7125	5151	7120	6360
7130	1371	7132	2760	7134	2493
7150	2295	7150	5276	7152	4650
7200	1450	0000	8068	0010	6277
0020	2050	0025	0561	0030	10746
0035	10016	0040	0012	0100	5140
0110	6674	0200	6549	0205	3657
021P	5304	0220	5205	0230	6703
0200	7652	0260	0126	0270	5122
0150	6314	0320	0216	0330	0712
0340	6156	0600	2719	0610	5076
0611	7057	0615	2069	0620	0767
0010	1265	9000	2629	9010	9000
9012	1657	9015	2059	9020	0921
9030	1269	9050	10000	9050	1144
9060	5527	9065	1576	9070	1092
9110	1065	9112	0707	9115	1470
9120	0126	9125	1470	9130	0721
9135	1470	9140	4015	9145	0721
9146	2050	9200	4070	9210	5771
9220	5745	9220	6135	9200	2166
9400	0006	9405	3401	9410	5500
9420	1757	9425	1621	9428	4052
9429	2714	9430	3546	9432	2221
9433	7420	9436	2005	9430	7501
9439	4063	9440	5042	9445	7100
9450	7444	9460	1607	9461	1247
9465	2551	9470	4402	9475	1176
9480	5227	9490	4707	9000	1540
9010	9412	9020	7132	9023	2501
9030	3027	9040	2577	9050	0455
9060	1592	9000	2060	9500	4016
9510	2706	9520	5577	1925	3090
9530	1707	9560	5170	9565	1105
9566	4072	9550	0445	9560	5722
9570	1526	9575	1056	10000	11247
10010	9302	10020	9511	10030	10717
10040	7550	10065	4021	10050	0655
10060	11257	10065	10646	10070	10297
10000	12250	10100	5936	10110	15020
10120	2405	12000	3056	12000	11751
12010	7566	12020	1055	12020	3200
12030	10502	12040	0303		

Tired of typing?

Take advantage of our finger-saving offer on Page 69

Picture this...

DAVID GOODYEAR discovers how to get much more than graphs from the Atari 1020 plotter

HAVING invested quite a large sum of money on an Epson FX-80 printer not very long ago I was somewhat annoyed to read about the full colour Okimate-10 that had suddenly appeared on the market

Now I realise that the two are somewhat different animals and could be said to complement each other Nevertheless I think I would have bought the colour unit first as my primary use was for dumping graphic screens

I then realised that I had sitting in front of me a four colour printer in the shape of my 1020 plotter It just remained up to me to make it print pictures instead of nice graphs and line drawings

When run the program asks for a picture file name This must be any Antic mode 14 (Graphics 7 5) screen saved in binary format For people using the Micro-Illustrator package Koala-Pad or AtariArtist just press INSERT when the picture you wish to save is on the screen and you will create a file called PICTURE on disc that is suitable for this program

Next type the names of the four colours that you want the picture drawn in These will be in the same order as the four colour bars along the Micro Illustrator menu page

As soon as the last colour is entered the file will be loaded and the picture will appear on the screen so make sure that the correct disc is inserted and that the plotter is turned on, because it will start printing immediately the picture appears

It is about here that I can hear someone saying "Why isn't the actual dump portion, at least in machine code to speed up the process?

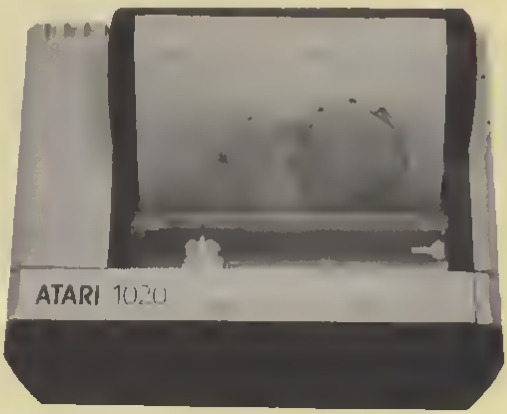
Basically we are limited to the speed that the plotter can run at and believe me it is slow It takes about five hours to run one picture so I tend to set it up before I go to bed and by the morning it has all happened

I have in fact run a compiled version of the program and it took exactly the same amount of time to print the same picture An early version of the program ran over the picture once changing pen colours each time they occurred but this took nearly twice as long as the second version that runs over the picture four times once for each colour

To speed up typing and save memory all the REMs can be removed – there are no references to them in the actual code The program is thus fairly self explanatory with the possible exception of the trap in line 770 and the reason for moving the screen

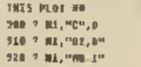
My 1020 has a habit of stopping and not responding to any input after about an hour of plotting This leads to a time out error and the trap simply feeds the flow back into the plotting routine

Another way to speed up the plot If you are there when it stops is to press the Break key and then type GOTO the line number that the program broke at This of course will destroy the screen and hence the reason for reserving space right at the beginning to protect the screen



Output

```
10 REM ** 1980 PLOTTER SCREEN DUMP **
20 REM **                          **
30 REM **          BY              **
40 REM **                          **
50 REM **       DAVID  GODFREY     **
60 REM **                          **
70 REM **      FOR   ATARI USER    **
80 REM **                          **
90 ? "G":S=PEEK(106):POKE 106,(S-32):S
=S-32:REM RESERVE SPACE FOR SCREEN
95 GOTO 530 :REM ** INITIALIZE ALL VARI
ABLES
98 REM 99 ROUTINE TO CONVERT PICTURE '
99TE' INTO BINARY FORMAT 99
100 FLAG=FLAG+1:IF FLAG()1 THEN 110
110 ADDR=ADDR+1:Z=PEEK(ASC#)
120 FOR I=1 TO 8
130 B=Z/2
140 S#=STR$(B)
150 NUM=NUM+NUM
160 IF NUM=0 THEN A$(I)="0":GOTO 180
170 A$(I)=")"
180 Z =NUM
190 NEXT I
200 REM ** ROUTINE TO CONVERT PASIS OF
 BITS INTO CORRECT COLOUR **
210 IF FLAG=4 THEN FLAG=0:CTR=4
220 T=Y-2
230 IF A$(T,T+1)="10" THEN C=REG1
240 IF A$(1,T+1)="01" THEN C=REG2
250 IF A$(1,T+1)="00" THEN C=REG0
260 IF A$(T,T+1)="11" THEN C=REG3
270 IF CTR=4 THEN T=5:CTR=0
280 RETURN
290 REM ** INPUT ROUTINE TO SELECT COL
OURS FOR PRINTOUT **
300 ? "G" ? ? "CHOICE OF COLJOUS"
310 ? ? " WEN BLACK OLUE GREEN WHITE
"
320 ? ? " TYPE COLOUR CHOICE AS SOOVE
 FOR       BOCK&ROWER  Press RETURN"
330 B$="     " INPUT B$:GOSUB 410 REG0
=COL:PR=ZZ
340 ? :? " TYPE COLOUR CHOICE AS ABOVE
 FOR       PLAYFIELD 0 press RETURN"
350 B$="     " INPUT B$ GOSUB 410 REG1
=COL PI ZZ
360 ? :? " TYPE COLOUR CHOICE AS SBOVE
 FOR       PLAYFIELD 1 press RETURN"
370 B$="     " INPUT B$:GOSUB 410.REG2
=COL P2=ZZ
380 ? :? " TYPE COLOUR CHOICE AS ABOOE
 FOR       PLAYFIELD 2 press RETURN"
390 B$ ="     " ISPUT B$ GOSUB 410"REG3
=COL P3=ZZ
400 RETURN
410 IF B$="WHITE" EVEN COL=4 ZZ=.15:RET
URN
420 IF B$="BLACK" THEN COL=0 ZZ=0:RETU
RN
430 IF B$="OLUE" THEN COL=1 ZZ=120 RET
URN
440 IF B$="GREEN" THEN COL=2:ZZ=160:RE
TURN
450 IF B$ "RED" THEN COL 3:ZZ=64:RETUR
N
460 ? "PLEOSE TYPE BACK OF COLOUR CORR
ECTLY*""B$="     " INPUT B$:GOTO 410
470 REM 99 END OF PICTURE FILE **
480 IF PEEK(195)=128 THEN 500
490 ? "Error ",PEEK(195);" at line ";Z
50#256+PEEK(186)
500 CLOSE #1
510 GOTO 800 REM ** SKIP INITIALIZATIO
N **
520 REM ** INITIALIZATION ROUTINE **
530 DIM A$(10),B$(5),A$(16),S1ORT$(7),
F$(16) FLAG=0:CTR=0 T=9:A$="00000000"
540 S1SQT$ "GRAPHICS 8+16 WP":FS="0 "
550 ? "G"";? :? "Enter file name ";? :?
 "D:";:INPUT B$ F$(LEN(F$)+1)=B$ GOSUB
 300
600 GRAPHICS 8+16+32
570 POKE 752,0:POKE 200,0:POKE 709,P
2:POKE 710,P1 REM ** SET COLOUR REGIST
ERS FOR SCREEN **
580 REM ** MAKE DISPLAY LIST IN ANTIC
 MODE 14 **
590 DISP=PEEK(560)+PEEK(561)*256+PEEK(5
60)
600 I I
610 ZZ=PEEK(559) POKE 559,0:REM ** SWI
TCH OFF SCREEN **
620 POKE (DISP+3),78
630 POKE (DISP+4),I6 POKE (DISP+5),55
640 FOR I 6 TO 100:POKE (DISP+I),14 NE
XT I
650 POKE (DISP+107),70 POKE (DISP+108)
,B:POKE (DISP+109) 55+16
660 FOR I 110 TO 198:POKE (DISP+I) 14:
NEXT I
670 POKE (DISP+1991,65 POKE (DISP+200)
,PEEK(560) POKE (DISP+201),PEEK(561)
680 POKE 559,ZZ REM ** SWITCH ON SCREE
N **
690 REM ** SET UP SCREEN PARAMETERS **
700 ADDR=(55#256)+16
710 POKE 88,16 POKE 89,55*SCREEN=ADDR
720 IRAP 490 OPEN #1,4,0,F$
730 REM ** POKE ZOCO PRIOR TO MOCHINE
CODE LOAD **
740 POKE 845,1 POKE 300,4 REM ** GAIVE
 D ONE READ **
750 CLOSE #1 OPEN #1,4,0,F$
760 POKE 852,16:POKE 853,55 REM 88 SCR
EEN START ADDRESS **
770 POKE 856,0:POKE 857,128:REM ** 8 OF
 BYTES TO LOAD **
780 POKE 854,7 SLOAD=USR(ADDR(STR0T$))
REM ** INVOKE LOAD **
790 CLOSE #1
800 ADDR=ADDR-1 CLOSE #1 TRAP 1500
810 REM ** 1820 POINTER ROUTINE **
820 OPEN #1,8,0,"D "
830 ? #1,"E\" ? #1,"60,-700":REM ** GO
VE UP PAPER **
840 ? #1,"I"
850 FOR B=0 TO 1 REM ** 4 COLOURS **
860 FOR H=0 TO 302 STEP 2 REM ** 192 P
IXELS &C9055 **
870 FOR V=0 TO 636 STEP 4 REM ** 160 P
IXELS DEEP **
900 GOSUB 100 REM ** CONVERT 'BYTE' **
890 IF C()0 THEN 900 REM ** DO COLOUR
INTS PLOT **
900 ? #1,"C",0
910 ? #1,"02,0"
920 ? #1,"PR 1"
930 ? #1,"D2,1'
940 ? #1,"PR,2"
950 ? #1,"D2,2"
960 ? #1,"PR 3"
970 ? #1,"D2,2"
980 ? #1,"PR 4"
990 ? #1;"I"
1000 IF V=636 THEN ? #1;' M2,-640":? #1
,"I" REM ** NEXT ROW **
1010 NEXT V
1020 NEXT H
1030 ? #1,"M-184,0" ? #1;"I":GOSUB 5000
END-1 NEXT B REM ** DO IT ALL AGAIN FOR
 NEXT COLOUR! **
1040 POKE 100,5 ? #1;"PR, 200" CLOSE #
1 END  REM ** MOVE UP PAPER RESET SCRE
EN **
1050 GOTO 256*PEEK(1023)+PEEK(1024) REM
 ** ERROR ROUTINE TO ALLOW FOR 'ODD' IN
PUT NUMBERS! **
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	8457	70	13221	130	6845
40	1021	80	7965	140	5015
150	6877	160	4768	170	2890
180	1046	190	1914	200	1753
210	5835	220	1454	230	1897
240	1345	250	12842	260	5268
270	994	280	5834	290	5015
300	5831	310	5839	320	4124
330	1490	340	10822	350	5735
360	6382	370	10595	380	8104
390	10579	400	8211	410	10581
420	8110	430	10583	440	8225
450	1496	460	7141	470	6810
480	7846	490	7395	500	6965
510	13180	520	5405	530	4200
540	10584	550	1555	560	7450
570	6447	580	11656	590	5310
600	14111	610	3861	620	10968
630	6585	640	5811	650	586
660	9127	670	2967	680	6290
690	7878	700	10587	710	7191
720	12075	730	7042	740	8818
750	2814	760	6524	770	1951
780	6501	790	8751	800	1980
810	10214	820	5163	830	10540
840	1559	850	5711	860	5877
870	2736	880	7515	890	1121
900	5781	910	7894	920	8880
930	6565	940	8248	950	1868
960	1546	970	1526	980	1502
990	1527	1000	1508	1010	1520
1020	1609	1030	1652	1040	1121
1050	9334	1810	1377	1820	1276
1830	15313	1840	13664	1850	15259

Bugged - by lack of space

I HAVE discovered a rather annoying bug in the Revision B Basic on my 800XL I have spoken to Atari Help-Line who could not assure me that this particular bug has been ironed out in Revision C

It occurs when using a numeric array The first time an array is dimensioned and values given to the elements everything works as it should

However if I try to clear the array with the commands CLR or RUN the array is undimensioned as expected but if the array is then re dimensioned the original values are present in the elements of the array

Has anyone come up with a routine that will quickly and efficiently clear the array properly?

My only solution so far is to use a FOR NEXT loop to set all the values to zero This is of course a very slow process with a large array or even with several smaller ones – **J Ellis, Bury**

● The bug you mention is not so much a bug as a limitation of space

To fit everything they wanted into 8k the authors of Atari Basic had to leave some things out – and one of those was auto zeroing of strings and arrays although normal variables are zeroed

When you type CLR the space allocated for anything you have DIMed is freed but the contents remain intact Thus the next time you set up an array or a string the previous data is still present

The cure is remarkably simple At the start of your program work out how much free memory you have allocate a string (or two strings if there is more than 32k left) to fill the whole of memory and fill them with zeros (ATASCII 0 is Control-Comma the little heart) Then CLR the space again and continue as normal

Any array you then DIM will be allocated into your newly cleared RAM

For example

```
10 A=FRE(0) :IF A>32000 THEN A=A-32000
20 DIM AS(A):AS=CHR$(0):B$=AS:B$(A)=AS
30 DIM FILL AS BUTE NUMBERS
40 IF B$(0,0)=CHR$(0) THEN B$(0)=B$:GO TO 30
50 DIM AS(10),BS(100),CS(100)
60 CLR :REM FREE-UP THE MEMORY AGAIN
100 DIM BUTE OF FREE MEMORY HERE
```

Of course should you know how large your arrays will need to be you could simplify the above greatly setting the string to a length of eight characters per array element needed

Protection program

AFTER running Listing 1 of André Willey's Break and System Reset protection program I was amazed how easy it was to break into the program using both keys

When I pressed the Reset button I quickly pressed the Break key as soon as the familiar blue screen appeared and I was confronted with a Stopped at line 500 message, thus enabling me to list the program with ease

I hope I haven't disheartened readers who have been using this since it was published but I thought they would like to know before they start lending their programs to friends who just run the program break into it and copy the listing – **Darren Granger, London S W**

● We know that this can happen – if you catch the Break key before the program pokes locations 16 and 53774

The only cure for this is to use a small piece of machine code something which André expressly didn't want to do since that article was meant to show easy-to-understand ways of protecting the system

However Geoffrey McHugh has written in with a small machine code routine to do this very thing and since the last thing any good programmer should want to do is re invent the wheel here is his solution

★ ★ ★

I WAS very interested in André Willey's article on Reset protection in the August Atari User

However the reset protection routine in its present form disables the disc operating system This means that pressing System Reset in a program using both the protection system and the disc drive will cause any further use of the disc drive to generate an error

I have found a solution to this problem

As stated in the article the computer uses different locations for cassette and disc initialisation when the Reset key is pressed

If location 9 contains a 3 it will do both cassette and disc initialisation This is done in the order cassette initialisation followed by disc initialisation

Because the protection routine creates an error during the cassette section the disc initialisation can never take place To remedy this situation the addresses should be swapped around

Lines 120-140 in Program 1 in the August article should be changed to

```
120 POKE 1 PEEK(52):POKE 9 PEEK(53)
130 POKE 2 :SETPOKE 5 109
140 POKE 5 1
```

For the 400/800 the 52 in line 130 should be changed to 54

I have also written a small machine code routine which will disable the Break key when Reset is pressed and will then call the TRAP routine in the Basic interpreter

Here is a Basic program to install this routine

```
1 FOR I=1536 TO 1626:READ A:POKE I,A:CHK
KSUM=CHKSUM+A:NEXT I
2 DATA 72,165,16,72,169,64,133,16,169,26
,141,54,210,104,133,16,96
3 POKE 2,PEEK(12)
4 POKE 3,PEEK(13)
5 POKE 12,244
6 POKE 13,5
7 POKE 9,1
```

On the 400/800 line 2 should be

```
2 DATA 72,165,64,133,16,169,26,141,14,210,104,133,64,96
```

– **Geoffrey McHugh, Hamiltonstown, Co Armagh**

Hot line to Miner 49er

HAVING just read the software review of Bounty Bob bounces back I was intrigued to read about typing in the Big Five telephone number to jump levels

I am a 800XL owner but I'm afraid it's not an open secret to me to jump levels on Miner 2049er Please tell me how

Also could you perhaps tell me the virtues of a track ball against a joystick – **P Hallwell, St Helens.**

● This feature is really for demonstrating the game only but it has been published so many times before in various magazines that once more won't do any harm

However please remember that the fun of the game is in solving the problems and you'll find the game becomes boring if you always jump the levels

Use it *only* to get to levels you can play up to anyway – you have been warned

The phone number is on the front of the cartridge so just climb Bob on to a safe point on the first level type in the number (digits only – no hyphens) and then use the Shift key with the level number you want to jump to

A track-ball is simply another way of controlling games using a rotating ball which you roll in the direction you wish to move

Missile Command for example has a special option which makes the game a joy to play on a track-ball but in a lot of cases a joystick is far easier to use

Modified Frog Jump

I HAVE found Atari User very readable and informative

I found Frog Jump in the June 1985 issue to be totally addictive after I had made three modifications to the program

Modify line 230 to read

```
230 POKE 559,0:POKE 54286,192
```

Otherwise the screen display for the second round is a little garbled

Modify line 400 to read

```
400 S=STICK(0):IF S=15 THEN S=PEEK(632)
```

This prevented the screen going into attract mode if I had been playing for some time unless the joystick had not been moved

Modify line 1040 to read

```
1040 IF M=1 THEN SOUND 0,0,0,0:SOUND 1,0,0,0
```

Originally only Sound 1 was turned off leaving an annoying buzz when playing the higher levels

I am still having difficulty with Bomb Run (July issue) I have modified the graphics subroutine to suit my 400 machine - luckily the same issue explained how to do it - but the use of the screen memory does not work

I presume the screen memory starts at location 40320 in graphics Mode 1 on Mr Waddilove's computer but not on a 400

So far I have been unable to find an equivalent location by trial and error Could you tell me what the location should be? – **David Wilkie, Newton-le-Willows, Merseyside**

● Thanks for the tips on Frog Jump Bomb Run will not run on anything other than a 48k machine without modification See Peter Appleton's suggestions on Page 58 of the October issue

You can of course always ask your computer where its particular screen memory begins In a given graphics mode Locations 88 and 89 contain a two-byte address for the current start of screen memory To get at it use

```
MEM=PEEK(89)*256+PEEK(88)
```

or

```
MEM=DPEEK(88)
```

if you have Basic-XL

Try it and then POKE MEM 1 and look at the top left corner of the screen

Cardiff user group

I HAVE output do you have input and live in the Cardiff area? If so and you are interested in joining or forming an Atari user group please contact me at the address on this letter

You may even find a computer being put to uses that you had not thought of Look forward to hearing from all you Atari enthusiasts out there in the wilds of the Cardiff area – **Raymond Price, Mandeville House, 9 Lewis Street, Canton, Cardiff**

● You might like to know that there is a Cardiff user group c/o Mr R Khan 322 Whitchurch Road Heath Cardiff CF4 3NG

Getting DATA taped

I HAVE an 800XL with a 1010 program recorder but I cannot seem to record data on to cassette tapes

The recorder manual is of no help and neither is the information in the User Guide for the computer

Please can you describe a program to me to allow say the input of 20 names and addresses of friends and their birthdays

I have no problem with sections dealing with the comparison of current date with a date on file but I want to be able to keep the data separate from the program including the use of DATA and READ – **A P Johnson, Potters Bar**

● The best way to do what you're asking is to use a separate tape for your data The main program would load from one tape and input/output its data from the second tape in the form of

```
INPUT #1;str$;num1,num2
```

or

```
PRINT #1;"text";string$;num1,num2
```

Note the way that the PRINT statement also prints commas between each item of data This is because INPUT would otherwise see the line as one long piece of text

Don't forget to first OPEN the file as follows

```
OPEN #1,8,0,"C:"  OPEN for output
OPEN #1,4,0,"C:"  OPEN for input
```

As cassette systems can only handle data in one direction at a time you must read all of the data into an array or a string – perhaps using long-strings to simulate a string array – process it in whatever way you wish then output it all to the tape again

Because of a quirk in Atari Basic you may have to read the numbers into an ordinary variable and then put it into the array for example

```
INPUT #1;NUM1:ARRAY(10)=NUM1
```

It is best to use a terminator record such as four asterisks or all zeros for numerical data to tell your program when the data is finished otherwise you'll get an End-of-file error (Error 136) when reading it back in again

You should find this method a lot easier to use than trying to update data statements within one program

Computer suspected

I AM 13 years old and an Atari 800XL owner Recently while I have been programming the computer has returned errors where I can see nothing wrong

Then if the line is entered again slowly exactly the same no errors occur and the program works perfectly

But in a few cases the computer returns error 13 in some FOR/NEXT loops where poking is involved

It sometimes helps if I change variable names What difference should this make?

Also having saved and loaded the program again on listing the computer will sometimes print the first two lines of the program and then a jumble of characters

This usually happens when the computer has been on for quite a while Can you tell me if anything is drastically wrong with my machine or is it just me? – **Michael Lord, Barrington**

● Sounds like you might have a faulty computer It could also be your Basic giving you trouble which might be solved by a Revision C

Also be very careful when doing pokes as these are potentially very dangerous to your program

The computer could lock-up because of one wrong poke and you've lost your program

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros about tips you would like to pass on to other users and about what you would like to see in future issues.

The address to write to is

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

On the whole though we would advise having the computer looked at preferably by Atari themselves or an authorised service agent

Auto run for Basic programs

IS there any way that I can make Basic programs auto run after LOADing?

I own a 400 16k and hope to get either a 130XE or an 800XL

When typing in long programs my 400 sometimes seizes up I can enter commands but when I press Return nothing happens Only reset can restart it but the same thing happens straight away

Will an old 410 recorder work with XL and XE computers?

I typed in Bomb Run from your July issue but when it's run the play area goes fuzzy Is there an error in the listing?

Are Micronet and MicroLink the same? If I get a suitable modem would I be able to communicate with other makes of computer keyboard to keyboard (Commodore Spectrum)? – **R S Burke, Argoed, Gwent**

● To make a program RUN after loading save it using the SAVE C option not CSAVE This takes longer but allows you to run it with the RUN C command

If you also protect it as shown in August's *Atari User* any other action but RUN C will crash the machine after loading is finished

The problem you mention about lock ups when programming stems from a bug in the old Revision A Basic

It shows up most often after a lot of heavy editing and the cure is to buy a copy of Revision C Basic

The 130XE has this built in so you may prefer to wait until you get your XE In the meantime CSAVE your programs regularly if you are editing a lot

On your other questions a 410 recorder will work with an XL/XE there is no error in the Bomb Run listing MicroLink and Micronet are quite separate (the former being part of Telecom Gold and the latter part of Prestel) and yes you would be able to communicate assuming the other micro also had a modem and both micros had suitable software

Laser disc link?

CONGRATULATIONS on a nice informative quality magazine I would like to make several suggestions on additions to your magazine

● *Second hand software/hardware for sale or exchange*

● *A full A to Z of Atari games (several loose leaf pages) in each issue with an option to buy a binder*

● *An article about laser discs to use with Ataris (are they going to design something to this standard) so that you could use games like Firefox Dragons Lair or is there something already available to achieve laser disc type graphics?*

MSX users tell me they can use laser disc based games on their computers eg Firefox Dragons Lair – **T. Green, Preston**

● As far as we know there are no plans to bring out a laser disc interface for the 8 bit Atari range basically because with the small number of laser disc players around there seems little point

There will be a CD ROM device available for the STs and we see no reason why something similar couldn't be

£s and graphics problems

I AM writing this letter using the new Atari 1029 printer and HomeWord word processor

I have just run into some trouble and was wondering if anyone out there could help me

I am trying to get my 1029 to print the £ sign in programs that I write myself The problem is not in getting the pound sign to print it is in stopping the line feed The way I do it is as follows

```
10 LPRINT "The amount you owe is";CHR$
(27);CHR$(32);CHR$(48);CHR$(27);CHR$(32)
;
20 LPRINT "10 45"
```

The problem is that the LPRINT statement in line 20 causes a line feed on the printer, so I end up with the amount on the next line

I'm also having trouble in trying to get Home Word to print in boldface and underline Is this because I'm using a 1029 and HomeWord does not support these functions?

If so is there a word processor that will support them?

Having just pointed out a defect in HomeWord I must say I do find it a very good word processor and consider it very good value at £50 – **S M Lupton Jnr, Bagillt, Clwyd**

● Dealing with your last point first we the configure printer option on the main menu This will let you enter the codes used by your printer to do various styles of printing including underline and bold (the codes are listed in the 1029 manual)

You can use Control-W to write these changes into your defaults file See the HomeWord manual and your printer manual for further details

You could use a semicolon at the end of the LPRINT line to pause at that point rather than do a line feed but this gives somewhat unpredictable results

For better results write your program as follows

```
5 REM BU G G "P: :REM BEFORE ANY PRINT
ING
10 PRINT #1;"The amount you owe is "C
HR$(27);CHR$(33);CHR$(48);CHR$(27);CHR$
(32);
20 PRINT #1;"10 45"
30 CLOSE #1:REM AFTER ALL PRINTING I
NGS
```

Better still all of your CHR$ numbers can be typed from the keyboard which saves a lot of time For a £ sign try using the following

```
PRINT #1;" ESC  CHR  Control-U
Control-4  Ctrl  Ctrl  Control 7
```

I HAVE an Atari 800XL, with Atari 810 disc drive Atari 1010 Atari 850 and an Epson RX80F/T printer

My problem is printing graphics, because although I have tried the various control codes and examples in the operation manual I only seem to be able to print blank spaces

Also when using the Atari Writer the first line is always printed in condensed mode – **Herbert Spencer, Maldstone.**

● Use Option 3 on the printer menu with the Epson range to avoid the first line problem or better still use a printer driver to configure AtariWriter for use with Epson printers

We don't know which graphics you refer to but we suspect you mean the bit image modes not the little character graphics – pictures of lines men cars etc.

Don't forget that as Mr Lupton has found out LPRINT gives odd results in Atari Basic when used with semicolons

Change all LPRINTs in the examples in the printer manual to PRINT#1.. (Don't forget to OPEN the channel first with OPEN#1,8,0,P.)

This should cure the problem but if it doesn't write back and let us know exactly what you're having difficulty with

done for the old range given the customer interest

However if the MSX people think they've got the edge on you because they can spend £300 on laser disc equipment to play games on show them what you can do with Reecus on Fractalus for £15!

Pointers on printers

I THINK the content of Atari User is very well balanced and the special offers a real bonus

What I would like to know is are you going to do hardware reviews for such things as printers monitors etc

I am interested in purchasing a printer but the market is so vast and varied I wouldn't know where to start

Perhaps you could run a page on a range of Atari-compatible printers covering the various price ranges

Also if this letter gets printed perhaps someone or yourselves could tell me if Atari joystick connectors are available as a separate item

Looking forward to your next issue here in West Germany – **Ian Hill, RAF Gruggen**

● There are so many printers available as you've already discovered

What we'd like to suggest is that readers send us details of the printer they use together with details of how it is interfaced – 850 module joystick port etc – and a brief list of the good and bad points they've discovered We should then be able to print a real users' report

Joystick connectors called 9-pin D sockets can be bought from electronics shops or mail order from Maplin

No go cartridge

I BOUGHT an Activision Star master cassette not realising that it wasn't compatible with my Atari 800XL

It should be possible to construct an adaptor so that it can be plugged in I should be most grateful if you would send me details of the best way of doing this – **M ● Holland, Welverhampton**

● There is unfortunately no way at all that a cartridge (or even cassette or disc come to that) designed for any other system will run on an Atari computer

This is because the chips used for each machine are very different and they all function under different types of operating system software

So if you have VCS Games Console cartridges Intellivision cartridges Commodore 64 BBC Spectrum Amstrad or any other computer cassettes or basically anything that doesn't say Atari 400/800/XL/XE or Atari Home Computer System (HCS) on it then it simply won't work on your 800XL Sorry!

Following up Converse

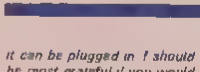
THIS letter relates to the recent publication of my program Converse in your magazine I was very pleased with the way your magazine dealt with it Thank you

There are however two main follow up points which should be made

I have written a short routine to speed up string searching within the program – I enclose the additional listing

With the Converse program loaded type in these additional lines and make the appropriate changes as instructed to lines 1460 and 1610 Then save this updated version

The second comment relates to an error in the instructions for use of Converse with the commercially available Sam program from Don't Ask Software The three extra lines should have been



Unfortunately the Sam and Reciter program take up too much memory and memory savings are required from the Converse program These are carried out as follows

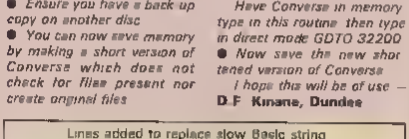
- *Run the original Converse program to create files*
- *Ensure you have a back-up copy on another disc*
- *You can now save memory by making a short version of Converse which does not check for files present nor create original files*
- *Delete all REM lines*
- *Line 1050 delete R$(110),*
- *Delete lines 1060 1180*
- *Delete the DATA lines 1900 2760 The short DATA line deleter routine enclosed can be used for this purpose*

Have Converse in memory type in this routine then type in direct mode GOTO 32200

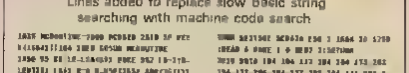
- *Now save the new shortened version of Converse*

I hope this will be of use – **D F Kinane, Dundee**

Lines added to replace slow Basic string searching with machine code search

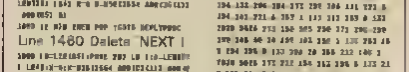


Line 1460 Delete `NEXT I`



Line 1610 Delete `NEXT X`

Data line deleter routine



Stubborn listings

I HAVE had an Atari 800XL 64k and 1010 recorder for just over two weeks now and so have learned how to complete simple tasks such as writing loading and running simple programs

I now get Atari User and in August's copy I noticed a program for a game called Raider 1997, so I thought it a good idea to have a go and try to program it

As I am not fully used to the keyboard yet it took me a few hours to type in, with a few mistakes along the way which were soon corrected

After completing this task and coming to the end I typed in CLOAD to which the computer began loading as normal

You can imagine my relief and satisfaction when the computer came back with READY

Then I typed in RUN and the computer came back with ERROR – 9 at line 1110

So from this point I typed in List 1110 and the computer duly returned with the aforementioned line I checked it against what was printed in the magazine and could find no fault

So I checked the Error message with my Atari Basic Reference Guide

According to the guide the Error – 9 meant Array or string dim error Now not knowing too much about string variables or dim statements as of yet, I put it down to the magazine making a

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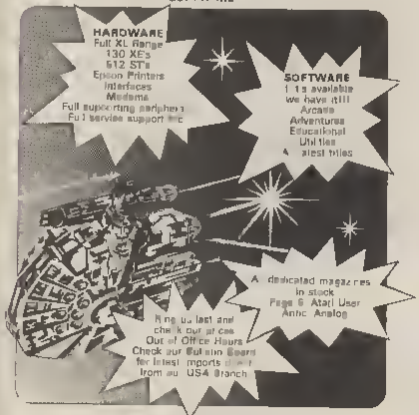

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Mailbag

printing error and I cleaned the program

So when September's magazine came out I was determined to program the game featured in it which was Maze Munch and I set about it

And to cut a long story short it all happened again

Now I am not complaining, but I would like to get hold of the right lines to fit it into the program. Any help or advice you could give me would be great as I would dearly love something that I have listed myself to come up on the screen

I do not think that it is the computer or recorder as normal cassette games like Pole Position load normally – **David Stephenson, Liverpool**

● Both games should give no problems on an 800XL so you've almost certainly made a typing error. Our advice would be to check your listing very carefully indeed.

Baulking Apocalypse

WHILE browsing through the advertisements in Atari User I came across one for Gamesmenship. They had Chuckie Egg for the 32k Atari but more things were to come. Sunaro Software had Chuckie Egg for the 48k micro. Could you please tell me who is right?

Secondly I bought Fort Apocalypse (for all of the Atari's) but it won't load. It loads the loading screen and counts down the blocks to 0 then the tape stops and nothing happens.

All my other games load and some use the loading procedure. I have bought it from two shops and still have had no luck. What's wrong? – **C Hellinshead, Stockton-on-Tees**

● The best thing for you to do in both cases is contact the companies concerned. We can't hold detailed information on all the thousands of games available for the Atari.

However we assume Chuckie Egg to be 32k and Fort Apocalypse should run on any Atari with a minimum of 48k.

If it doesn't send your tape back to US Gold and ask for a replacement.

Calling all radio hams

I HAVE an Atari 800XL and I'm also a radio amateur. There seems to be a great shortage of information on radio related programs. Does anyone know where this can be obtained?

I have a RTTY and Morse tutor programs but I would like to hear from anyone with the same hobbies. My phone number is Verwood 826763 after 6.30 or weekends – **G W Giles, Wimborne, Dorset.**

American disc drives

MEMBERS of my family are planning a trip to the USA and as they know about my saving for a disc drive they said they would try to get one for me.

My question is would it need a transformer or leads etc to make it work on my 800 XL HCS?

Also is the game Raid Over Moscow by US Gold out on cassette for the Atari and if not will it be available soon? – **James Bloodworth, Nottingham**

● You can use an American disc drive over here but you must change the power supply to a UK one before using it. If you don't you could hurt yourself.

Spare power supplies are available from Atari in Slough or dealers could order you one. Otherwise the drive will work fine over here.

If anyone is contemplating the same idea with a computer forget it. The TV system used over here differs from that used in the States so you'd need to buy an American TV set too!

There are no plans to release Raid Over Moscow in the near future.

Sour note at the Disco

I KNOW you always say that programs won't run because of typing errors but I reckon I've spotted a real mistake in one of your listings.

In last month's Disco programs the only way I could get them to work was by changing line 60 to GRAPHICS 1. Once I'd done that they worked beautifully.

Am I right or did I make a wally mistake somewhere else? – **Tina Beauchamp, Slough**

● Congratulations – you spotted the deliberate mistake and a prize is on its way to you. Seriously though you are right and the mistake was one of ours not Stephen Prince's.

The limits for GOSUB

WHAT are the rules for entry of more than one set of data statements in a program?

In issue 2 of Atari User in the sound article GOSUB is used as a procedure that Atari seemingly doesn't have.

What are the limits for GOSUB as a procedure call?

Also can you suggest a program for rotating 3D objects? – **M B Rooke**

● Any routine using DATA will fetch the next item of data available from within the program.

To change that sequence simply tell the computer to RESTORE Line nn and the next READ will be of data from line nn.

In the other case you refer to GOSUB DELAY we think you are mistaking a variable for a procedure name.

DELAY is simply a variable which contains the line number to GOSUB or GOTO. For example after typing DELAY=500 the command would translate to GOSUB 500.

To rotate 3D objects try Atari World or 3 D Super graphics if you can still find any copies about.

Alternatively there was an excellent program (written in Action!) which appeared in Antic magazine June 1985 (Vol 4 No 2).

Mere shadow of Elite

HAVING just bought the September issue of Atari User which I find excellent value for money I should like to comment on your reply to D Barrows of Recer about an Atari version of Acornsoft's Elite.

Have you ever seen or played Elite? If yes then recommending Star Raiders as a stop gap might lead to some disappointment or in the extreme cause D Barrows to exchange Atari for (heaven forbid!) BBC.

I have no wish to criticise Star Raiders. I own a cartridge myself and have had many battles with Zylon starships.

However it is little more than a good old shoot 'em up game. I feel that D Barrows yearns for the trading and tactical possibilities that Elite has to offer in addition to the Star Wars style engagements.

Perhaps Jupiter Mission which I believe is now available for the Atari might have been a more appropriate suggestion.

Anyway now to my problems. I was interested to see the program for the 1029 screen dump. Perhaps this could be modified for the 1020 printer plotter? If not where can I obtain a screen dump for the latter?

Please convey a large thumbs up to all your staff – **A.A Richards, Basingstoke.**

● Thanks for your comments. See David Goodyear's 1020 dump program on Page 53 of this issue.

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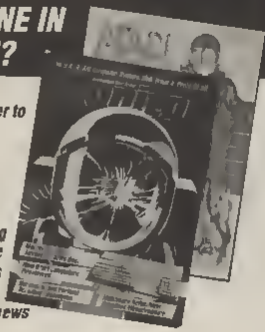

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ST software developer ANDREW BENNETT, currently working on his first game for the ST, writes about his initial experience of the new machine and gives an introduction to a language we're going to be hearing a lot about – C.

C will help you get more out of your ST

TO a registered software house, Atari supplies a two foot high stack of A4 paper, consisting of 25 manuals totalling nearly 4,000 pages of detailed information about the ST and Gem, the ST's operating system

Not one of these manuals is hole-punched for insertion into a folder so this is one of the first tasks that must be completed before any real work can get started

After several hours of frantic hole-punching it is time to sit back and try to digest some of the information contained in those manuals This is to say the least not at all easy and it can take many weeks to be able to grab the correct manual when you wish to look up one particular piece of information

Gem itself is made up of hundreds of small programs that each perform a separate task such as opening a window drawing a line changing a colour checking the mouse and so on

Each of these programs or routines as they are more commonly known is fully documented in the Gem manuals and can be included in the programmer's programs

Writing a program therefore becomes simply the linking of the various routines in the right order along with some others to perform whatever task the programmer wishes

Unfortunately this is not quite as easy as it seems because tasks such as moving a window are not done automatically by Gem but must be carried out by the program

Another difficulty is the fact that a program must take account of the fact that the ST can operate in various different resolutions – the number of dots on the screen All this adds up to a computer which is not difficult to program but takes a long time to get to grips with

Although the ST manuals are only available to software houses and are not particularly cheap the everyday home programmer need not feel left out

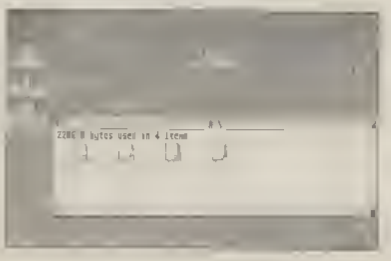
During the next couple of months several books will appear that will include most of the useful parts of the manuals written in English rather than jargon

The first quarter of the year should see the build up towards the hundreds of programs that will soon be available for the ST Those of you who owned an Atari 400 or 800 during their early days will recognise this time delay as programmers get to grips with a new computer Be patient! You won't be disappointed

Along with the documentation Atari also supplies two languages to software houses to develop their programs with – assembler and C

Assembler or machine code is the language that the ST speaks internally and is the fastest available for it Unfortunately developing programs in assembler is a long and error-ridden task

Software houses want to get their programs out as soon as possible and therefore most of them are using the other language C to write programs



on the ST

C is nearly as fast as assembler and is easier to write and learn It is a compiled language This means that you write your program save it to disc and then set a program called a compiler loose on it The compiler turns your C program into machine code and then places it on disc as a PRG file ready to execute The compilation takes at least five minutes during which time the ST can do nothing else

Writing a program in C is much the same as writing one in Basic or Pascal and if you know either of these languages C should be very easy to learn

I've included an example C program here complete with explanation If you don't find it too difficult and you want to do some serious programming on your ST you should consider buying a C compiler There are several available starting at about £50

Programming in C becomes more attractive when you remember that you can't use the ST's mouse or windows easily from Basic or Logo

The ST being a complex machine will have many thousands of words written about it over the years to come Many of the articles to be written will be supplying hints and short cuts to allow you to get the most from your ST

Let me be the first to give you a few that I have discovered during my hours at the keyboard

■ When you save the desktop you are also saving the position of the disc icons and whether a directory is on the screen or not

Make the desk look exactly as you want it and then save it You will find that the desk will now look just the way you want it every time you boot up the ST

■ Always set the clock at the start of a session Since the time is saved along with a file it will help you to differentiate between different versions of the same file

■ It is possible to change the name which appears under the disc icons on the desktop You can change the disc icon's name to for example MY DISC

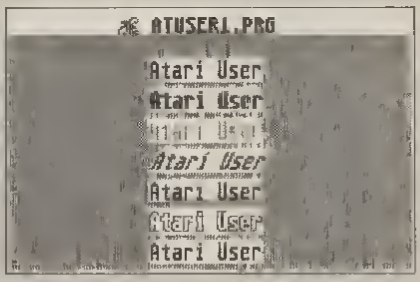
The method is fairly simple First select disc A by clicking on it once then go to Options and select Install disc drive You will be presented with the name and letter of the drive

Move the mouse pointer to the name line and click once You can now backspace over the name and type your replacement Certain characters such as the space will not be accepted

A little experimentation will show you which characters will and will not be accepted When you have finished entering the name don't press Return but click on the INSTALL box

Your name will now appear under the icon and will be saved if you save the desktop

THIS IS WHERE C AND BASIC DIFFER



THIS example program when run will place the ST's seven possible text modes on the screen (see screen dump above) In simple terms it can be broken down into the following steps

- Start the program and link it with Gem
- Print ATARI USER on the screen seven times changing the text type every time
- Wait for the ALTERNATE key to be pressed
- Exit

I suspect that most of you could write such a program in Basic given the necessary routines to do such things as print to the screen and change text type Writing it in C is just as easy as soon as you have noted various differences between Basic and C

- All variables and arrays must be defined at the start of your programs
- Arrays take square brackets [] rather than rounded brackets ()
- The C program can be divided into procedures which are called in whatever order the programmer wishes A procedure starts and ends with curly brackets {}
- When you run a C program it goes to a procedure called main and executes it
- You can mix upper and lower case as you wish The compiler ignores spaces and case
- C program lines must finish with a semicolon

The example program starts with a large comment box Comments in C are enclosed in /* and */ The next five lines are #include lines which tell the compiler that it will need the files enclosed in quotes to compile the program The files contain definitions of the Gem commands

The next seven lines define certain system variables that Gem needs to operate properly Notice that the maximum size of the array is also defined here The remainder of the definitions are variables and arrays used by the program INT

```
/*************************************************************/
/*              Demo program for ATARI USER                  */
/*                 By Andrew R  Bennett                      */
/*                    January 1986                           */
/*     -- Write different text types to the screen --        */
/*************************************************************/

#include "portab.h"     /* Include files */
#include "obdefs.h"
#include "define.h"
#include "gemdefs.h"
#include "osbind.h"


/* Variable Definitions */

int     control[12];    /* Various system variables */
int     intin[128],
int     ptsin[128];
int     intout[128];
int     ptsout[128];
int     work_in[20];
int     work_out[57];
int     handle;         /* The number of the screen */
int     dummy;          /* Dummy variable */
int     i;              /* For loops */
int     key_state;      /* The state of the ALT key */
int     xres, yres;     /* The x and y res of the screen */
int     text_type[7];   /* Array to hold types of text */
int     effect;         /* The text effect in question */

/* Open Work station */

open_work()
{
        for(i=0;i<10;work_in[i++]=1);
        work_in[10]=2;
        handle=graf_handle(&dummy,&dummy,&dummy,&dummy);
        v_opnvwk(work_in,&handle,work_out);
        xres=work_out[0];  /* Find the x and y res of the screen */
        yres=work_out[1];

} /* End open_work */

/* Wait for key */

wait_key()
{
        do
        {
        vq_key_s(handle, &key_state);
        }
        while (key_state == 0 );

} /* End key_state */

/* Print string */

print_string()
{

        text_type[0]=0; /* Ordinary text */
        text_type[1]=1, /* Bold */
        text_type[2]=2; /* Grey */
        text_type[3]=4; /* Italics */
        text_type[4]=8; /* Underlined */
        text_type[5]=16; /* Outlined */
        text_type[6]=32; /* Shadowed */

                for(i=0; i<7; i++)
                {
                effect=text_type[i];
                vst_effect(handle, effect );
                v_gtext(handle, (xres/2)-50, (100+(i*20)), "Atari User");
                }

} /* End print_string */


/* Main routine */

main()
{

appl_init();
open_work();
print_string();
wait_key();
appl_exit();

} /* End Main */
```

means make the variable an integer

If you look to the end of the program you will see the main procedure This procedure calls each of the others defined above it In order Let s look at each one in turn

appl_init() starts the program and links it to Gem This procedure is defined in one of the # include files and must be called at the start of all your C programs

open_work() is defined just after the variable definitions and sets up the screen to be used by the program Don t worry too much about its contents Handle is a variable which the program keeps to point to the screen The x and y resolutions are also passed to the program so that it knows what type of monitor it is operating with

print_string() is the most important part of the program Its first seven lines set up an array to hold the values for each of the text types The next line contains a FOR statement C s FOR loops are different to Basic s but have the same purpose The eighth line of print_string means start i at zero and execute the loop enclosed in curly brackets until i equals 7 The loop changes the text type using Gem s vst_effect routine and then places ATARI USER on the screen at a certain line

wait_key() employs Gem s vq_key_s routine to wait until the ALTERNATE key is pressed by using C s do while loop

appl_exit() is the last procedure called and it simply tells the ST that the program is over and command can be returned to the desktop

Not too difficult is it? C is much more like Basic than you might have previously been led to believe If you do decide to learn C you can obtain more information from several books

Some of the latest ones are tailored for the ST and will also give you information on Gem

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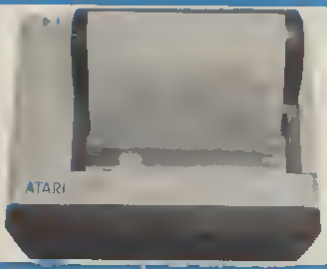

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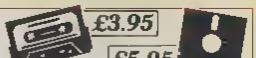

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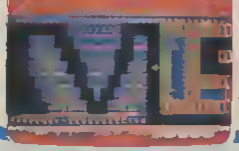

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