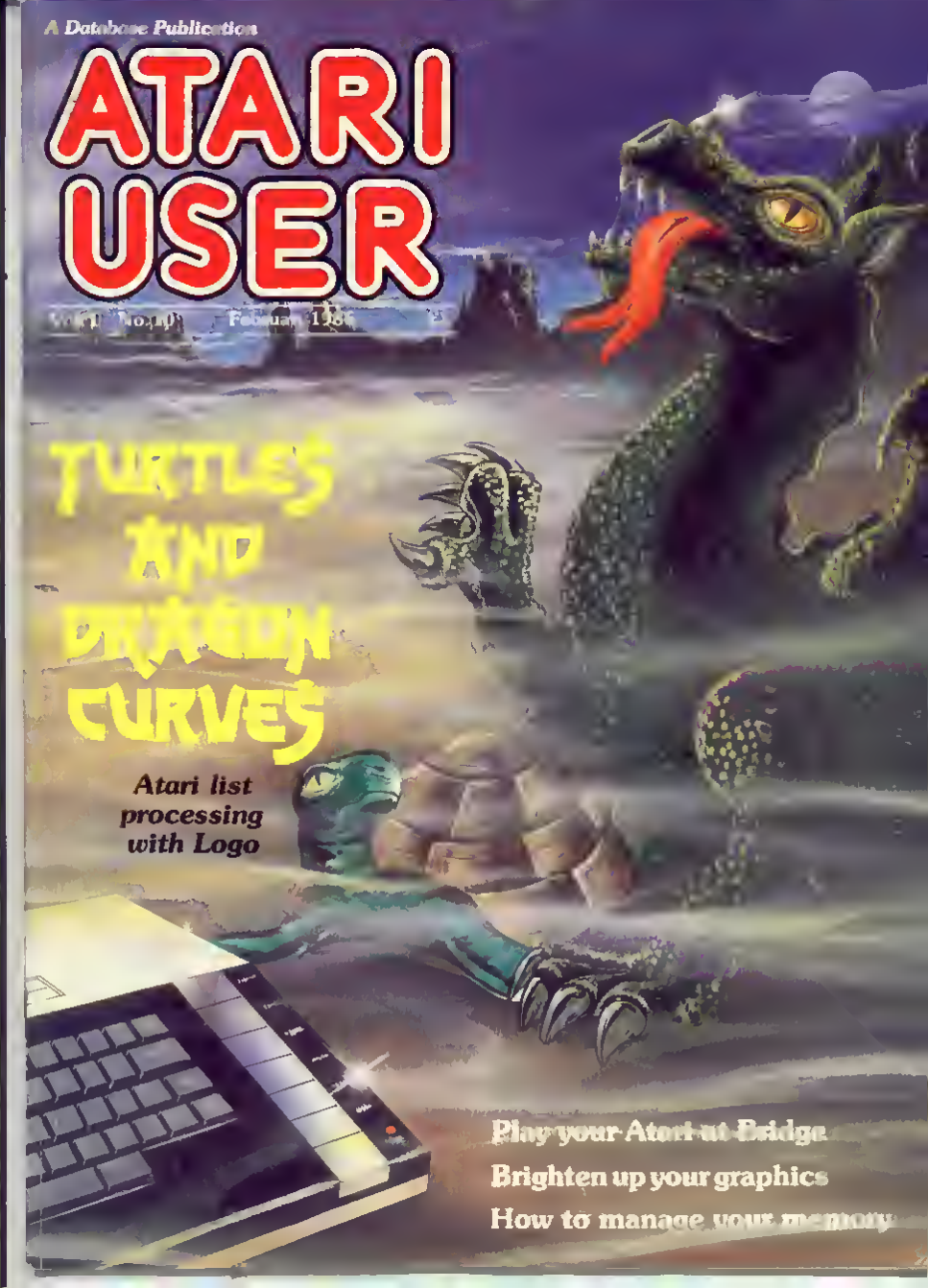
A Database Publication

ATARI USER

Vol 1 No 10 February 1986



TURTLES AND DRAGON CURVES

Atari list processing with Logo

Play your Atari at Bridge

Brighten up your graphics

How to manage your memory

THE CHART TOPPING FLIGHT SIMULATION NOW ON ATARI

FIGHTER PILOT

ALSO AVAILABLE ON 48K SPECTRUM, CBM64 & AMSTRAD

FREE COLOUR POSTER AVAILABLE WITH DISK VERSION

BY D.K. MARSHALL
ADAPTED BY NIK SEN

ATARI 400/800/600 XL 800 XL/130 XE WITH AT LEAST 48K.



ATARI

Fighter Pilot Disk	£12.95
Fighter Pilot	£9.95

SPECTRUM

Tomahawk 48K	£9.95
Night Gunner 48K	£8.95
Fighter Pilot 48K	£7.95

COMMODORE 64

Speed King Disk	£12.95
Speed King Cassette	£8.95
Fighter Pilot Disk	£14.95
Fighter Pilot Cassette	£9.95

AMSTRAD CPC 464 464 6128

Fighter Pilot	£8.95
Fighter Pilot Disk	£13.95

[illegible] available to Digital Integration

I enclose a cheque/P.O. for £[illegible]

Name _____

Address _____

Please debit my Access/Visa card no

Expiry date _____

VAT and p&p inclusive within UK. (Overseas inc. 55p per cassette)

Tele Sales [illegible]

DIGITAL INTEGRATION

Watchmoor Trade Centre
Watchmoor Road
Camberley Surrey
GU15 3AJ

AT2

Trade and Export enquiries welcome. Lifetime Guarantee.

If you can't stand adventure, skulduggery & mounting tension...



...don't buy it.

If you accept this mission, then you will have to battle with the elements and overcome the many natural hazards that await you on Spy Island. Real time action, seven levels of difficulty, full screens. Simultaneous (TM) play (TM)/2 players can play at the same time, shark attacks, quick sand, time bombs, fire bombs, sword fights etc. Are you our toughest challenge so far? The most challenging, most exciting non stop action strategy game available now for your Atari 1 or 2 players option.

Cassette £9.95 Disc £14.95

Available from all good computer software stores or post free from **Databyte**, Suite 31A, Grove Terrace, Highgate Road, London NW5 1PL. Telephone 01-482 1755.

FIRST STAR SOFTWARE INC.™

FOR ALL ATARI COMPUTERS 400/800/XL/XE WITH MIN 48K RAM

ATARI

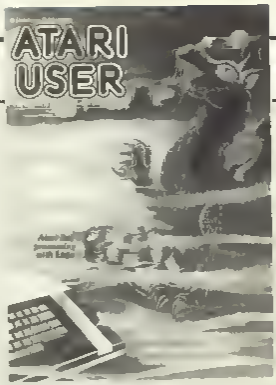
DATABYTE

Power to your palette

It's probably the most powerful and versatile graphics design program available for the Atari computer. It's simple to use and make a joy for people of all ages to play. With 128 colours and 9 different screen areas to choose from. An incredible 128 different colours can be used in any one picture. A three-stage Zoom feature allows one the ability to do very detailed and intricate work.

Other features include the use of text in your pictures, 40 different brush patterns, a brush editor to create your own brush patterns, character editor, circle draw, brush speed control, mirror and you can even obtain a print out of your pictures. These are just a few of the many fine features to be found in the GAD. Ask your dealer for a demonstration now. **Disc £29.95**





Vol 1 No 10 February 1986

Managing Editor **Derek Meakin**
Features Editors **Cliff McKnight**
Mike Bibby
Editorial Team **Alan McLachlan**
Kevin Edwards
Pete Bibby
Roland Waddilove
Technical Editor **André Willey**
Production Editor **Peter Glover**
Design Editor **Heather Sheldrick**
News Editor **Mike Cowley**
Advertisement Manager **John Riding**
Advertising Sales **John Snowden**
Editor in Chief **Peter Bramald**

Editorial 061-456 8835
Administration 061-456 8383
Advertising 061-456 8500
Subscriptions 061-480 0173
Telecom Gold 79 MAG001
Telex 265871 MONREF G
Quoting Ref 79 MAG001
Prestel Mailbox 614568383

Published by:
Database Publications Ltd,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY

Subscription rates for
12 issues, post free
£12 – UK
£15 – Europe
£30 – Overseas (Airmail)

Atari User welcomes program listings and articles for publication. Material should be typed or computer printed and preferably double spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped self addressed envelope otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all rights basis.

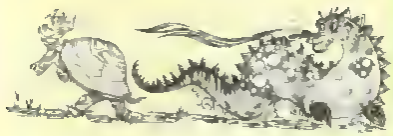
© 1985 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken the publishers cannot be held legally responsible for any errors in articles, listings or advertisements.

Atari User is an independent publication and Atari Corp (UK) Ltd are not responsible for any of the articles in this issue or for any of the opinions expressed.

News trade distribution
Europress Sales and Distribution Limited, 11 Brighton Road, Crawley, West Sussex RH10 6AF. Tel 0293 27053

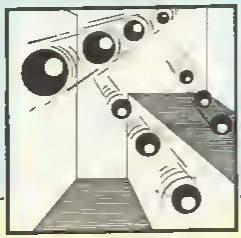
News 7
All the latest developments in the expanding world of Atari computing

Atari Computer Show 11
Your reduced-price advance ticket for the biggest event of the year for all Atari users



Logo 12
The turtle meets a dragon in Sol Guber's Logo tutorial.

Machine Code 18
In the second part of the series Stephen Williamson starts looking at the assembly language version of Alien Attack



Game 23
Anyone can play Roland Waddilove's Bounce game but it will take thought to achieve a measure of success

Contents

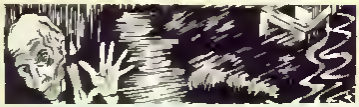
FLASHER
Give your Atari a flashing colour facility with this handy USR routine from Richard Parkes — 25

Graphics
Mike Rowe provides a useful routine for manipulating Micropainter screens — 27



Game
If you are three players short of a Bridge foursome John Hooper s program has come to your rescue — 32

Adventuring
The intrepid Brillig boldly goes where no hand has set foot — 38





Softwara
Something for everyone this month with Fighter Pilot First Steps with Mr Men, Axis Assassin and Panzer Grenadier for the 8 bit machines and an edventure starter pack for the ST — 41

Programming
Len Golding gives some good advice on memory management techniques — 45

ST Problems
Andrew Bennett takes a look at some of the queries from ST users — 49

Utility
Paul Lay provides an interrupt driven clock so you ll know the time when you re programming into the small hours — 51

Mailbag
Five pages of your letters Just what was that character in line 9702 of January s Esmeralda program? — 53

Order Form
Order everything you need on this one handy form — 59



FREEBIE
This month s freebie for Atari User disc and tape purchasers is Demon's Lair It s an adventure game to challenge even Brillig! — See Page 60

Centretime Limited proudly announce



the NEW RELEASE OF

HILDERBAY SOFTWARE

By:
Mike Sslem

CENTRETIME LIMITED
PO BOX 201, KINGSTON-UPON-THAMES
SURREY KT1 1SN TEL: 01-541 1424
TLX: 285871 MONFREF G. QUOTE: 72:20030

PROFESSIONAL SOFTWARE

DEALER ENQUIRIES WELCOME

NOW AVAILABLE FOR:

Apple II, II+, IIe, IIc, Sinclair, BBC+, Amstrad, Atari, IBM PC MS-DOS & CP/M Systems.

HILDERBAY PAYROLL Ver. 5.00 — £119.00 plus VAT
The ideal and versatile PAYROLL for small and large business users

HILDERBAY BOOK-KEEPER — £119.00 plus VAT
A flexible Journal which may be used as Purchase, Sales, General or Cash Ledger

HILDERBAY INVOICER — £119.00 plus VAT
Makes the tedious task of typing Invoices just that little bit easier

HILDERBAY SSP STATUTORY SICK PAY — £119.00 plus VAT

PAYROLL UPDATE FOR EXISTING USERS: £46.00 incl VAT

ALSO: 5.25" SSDD floppy disks £7.50***

*** PER BOX OF 10 DISKS (MINIMUM ORDER 4 BOXES) ***PLUS VAT

INTRODUCTORY OFFER: RECEIVE 10% DISCOUNT BY ORDERING NOW

PLEASE ALLOW 21 DAYS FOR DELIVERY

14 Day Money Back Guarantee

ORDER FORM. To CENTRETIME LIMITED, PO Box 201, KINGSTON-UPON-THAMES KT1 1SN

Please send me ☐ PAYROLL ☐ SSP ☐ INVOICER ☐ BOOK-KEEPER
I require DEALER INFORMATION & RATES ☐
MY CHEQUE/POSTAL ORDER FOR £_____INCLUDING VAT is enclosed
I understand that I have a 14 day Money-back Guarantee and allow 21 days for the processing of my order

NAME
ADDRESS
CITY
POSTCODE
TEL

The stops are out!

AN investigation by *Atari User* has revealed that more than 100 new products are likely to be launched at the first Atari Computer Show.

But such is the sensitivity of the marketplace that not one firm contacted was willing to provide details of their top secret projects at this stage.

'You'll just have to wait until the opening day,' said a spokesman for one leading peripheral manufacturer. 'This is a very competitive business.'

However *Atari User* has been able to learn that up to two thirds of the innovations are aimed at the eight bit market with one third ST bound.

To be held at the Novotel Hammersmith from March 7 to 9, the organisers – Database Publications – are already predicting the show will be a bonanza.

'With Atari having been around for quite some time – and this being the first user show – it's going to be a very special event,' says Derek Meakin, head of Database.

Excited

The Atari corporation itself is especially excited about it as there has never been an official show before, not even in the United States.

It is shaping up to be a real international showcase and that's why companies are pulling out all the stops to get products ready in time.

One company has even chosen the show to launch itself. SECS, a subsidary of Software Express, will take its bow on the opening day.

'We couldn't think of a better way to get ourselves known,' said a SECS spokesman.

And it seems that the show has already gripped the imagination of Atari users all over the UK.

Up in Birmingham, the Atari user group has already announced it has booked two coaches to take its members to the show.

800XL support is guaranteed

A SURVEY of leading suppliers has dispelled fears about future support for the 800XL now that it has ceased production.

It has conclusively revealed that ongoing back up is now guaranteed due to the machine's record sales over the Christmas period.

Almost all Atari's entire stock of 800XLs – some 100 000 machines – are reported to have been sold as a result of the cut price offer through Dixons High Street chain.

And this in itself is enough to ensure that both peripheral companies and software houses will carry on producing for the 800XL for the foreseeable future.

It seems that a lot of people were concerned that support for the XL would soon vanish once we had stopped making it, said an Atari spokesman.

But this could not be further from the truth now. For the huge user base that's out there as a result of recent sales will make sure the machine is alive and well for a long time to come.

Viable

'The fact of the matter is that it remains a viable commercial proposition to service the 800XL market.

According to Tony Deane of Silica Shop, the leading Atari distributor, there are currently 2 000 titles available for the 800XL and the figure is still growing.

Nor does he believe there is any cause for concern by anyone who has bought an Atari 8 bit machine – whether it is a 800XL or a 130XE.

The reason for this is that Atari has always had a policy of bringing out new machines totally compatible with its existing range, he told *Atari User*. This is a completely different approach than other manufacturers.

The company historically has always proved willing to stand by the consumer by producing new machines that work with old software – and vice versa.

Possibly the only way a problem could be created is if there was a lot of new software come out to fit the 130XE's higher memory capacity. Obviously this would not run on the 800XL.

But not much software makes use of this. After all, most software houses are clever and stick to 64k capacity so they can sell to users of both machines.

In fact of all the 8 bit software out at the moment there can't be more than six titles available for the 130XE exclusively.

ST software growing

THE new year began with an amazing total of nearly 150 software items available from UK suppliers for the 520ST.

Rob Harding, Atari sales and marketing manager says: 'The support from software developers is staggering.

'We now have more than 200 ST development systems in use in the UK – along with a similar number in the USA.

As a result of all this effort new software titles are appearing on a daily basis.

Atari seems to have succeeded in what Harding describes as our determination that the ST will have software covering all areas of the market from games and entertainment through to serious business and vertical applications.

The latest list shows more than 140 titles of which only 51 are classified as entertainment.

The others include 14 accounting packages, 10 word processors, three spreadsheets, nine databases, five communications packages, six graphics packages, 16 programming languages and 11 utilities.



Right on cue

DONCASTER based software house CDS is right on cue with its introduction of Steve Davis Snooker for the XL range.

It offers a large variety of skills to suit all players with three table speeds, accurate control of the degree of spin and play options – all by either keyboard or joystick.

Edit mode displays a hand which can pick up, move or drop balls anywhere on the table. This enables the setting up of trick shots or problems for later solution.

If a shot is "fluffed", pressing the cheat key allows the move to be erased and the table to be reset to its previous position.

"Even Steve can't do that", says a CDS spokesman.

Steve Davis Snooker is £9.95 on cassette and £12.95 on disc.

Pirate threat rebounds

THE man who is offering a reward for tracking down Atari software pirates has himself been accused of selling equipment that can be used for illegal copying.

John Lawson, boss of utility specialist Computer Support, told *Atari User* last month that he will give £100 for information leading to the successful prosecution of those guilty of pirating his products.

This followed the discovery that his firm's machine code monitor Ultimon and 80 column text mode 80 Column Pack had been copied and were available on the black market.

But Lawson's stand has angered several Atari users who feel he wants to have his cake and eat it too.

One of them, Andrew Fisher, secretary of the Plymouth Atari User Group, said: "I personally find it very hypocritical of Mr Lawson to complain about the way in which his utilities are sold on the black market.

Computer Support themselves sell items which, despite the disclaimer at the bottom of their adverts, enable people to pirate other companies' software. The offending products are the disc, cassette and cartridge backup programs and, most notably, the disc drive modification Bad Sector, which is exceedingly useful to anyone wishing to copy commercially available programs protected by – yes, you've guessed it – bad sectors.

Even the ROM-based Ultimon could be used to pirate software if it is anything like its American lookalike Omnimon.

Another reader who asked *Atari User* to protect his identity, wrote: "This is a blatant case of the pot calling the kettle black.

Mr Lawson's range of utilities comprises mainly piracy aids such as Ultimon which allows users to break into programs and write them to a file which is easily copied.

Also ROM Emulator, which allows cartridge software to be copied, Bad Sector, which enables copying of protected disc software, Super Disassembler to allow alteration of tapes to discs and vice versa, two disc copiers and various other utilities.

I would say that at least 50 per cent of his products are aimed at the pirates' market, which is strange coming from a man who is so much against piracy."

The criticisms were described as absurd by John Lawson.

He told *Atari User*: "Any utility can be part of the toolkit of a pirate. It's people who carry out illegal copying – not equipment.

No supplier of utilities can control the uses they are put to after purchase. We can only put our trust in the honesty and goodwill of our customers.

My programs are sold on the understanding they are used solely for personal backup and not for illegal purposes.

Thankfully the vast majority of Atari users are not cheats and are 100 per cent behind me in the stand I am taking against the pirates.

The people most likely to be upset about my actions are those engaged in copying themselves."

Reward offered to trap pirates

ANGERED by the extent to which pirates are infiltrating the public for [illegible] Alan Lawson, the boss of utility the specialist Computer Support is [illegible]

From last month's Atari User

Atari UK denies ST price-slashing report

A REPORT from America that Atari is about to dramatically slash the price of the 520ST has been officially dismissed as "speculative rubbish".

The story, which subsequently appeared on Micronet, the UK electronic mail service, claimed that the price of the machine was to be dropped to $399.

It alleged that this was to be timed to coincide with the launch of a 1 megabyte version of the ST – known as the 1040ST – to be marketed with colour monitor for $999.

When informed of this Atari UK's sales boss Rob Harding described the story of the proposed price cut as not only inaccurate but harmful.

"There are simply no plans to reduce the price of the 520ST package," he told *Atari User*.

What is actually happening in the States – and probably how the confusion started – is that for that market only there will be a special package made up of just the ST keyboard.

It will be sold at a reduced price, but there will be no disc drive and no monitor although it may come with a modulator. And it will not be sold in the UK.

"We remain convinced that the present 520ST bundle is the right configuration at the right price.

As far as a possible launch of a 1 megabyte version of the ST was concerned, Rob Harding was less dogmatic.

"We have no immediate plans to sell any machines with 1 megabyte of memory, whether they be STs or not," he commented.

Meanwhile, despite yet another further report from the United States that the proposed 260ST was to be dropped, Rob Harding insists it is still on its way.

"We are still on target for spring," he says.

Micro help for the handicapped

THREE special day courses dealing with the use of computer technology by disabled people have been arranged during March and April.

Dorset Spastics Society is sponsoring "Technology and Young People with Special Needs" in Poole on March 7. Enquiries to Mrs K. Vandervelde, Langside School, Langside Avenue, Parkstone, Poole, Dorset BH12 5BN.

On March 21 "New Developments in Technology and Disability" will be the subject of a course in London. Enquiries to Miss Hilary Came, Richard Cloudesley School, Golden Lane, London EC1Y 0TJ.

Barrow and District Council for the Disabled is sponsoring "New Developments in Disabled Living" on April 2 at Barrow in Furness. Enquiries to Mrs B. Holgate, Health Education Department, The Rookery, Brogden Street, Ulverston, Cumbria.

Failure

ATARI has pulled out of a deal to bundle Digital Research's GEMWrite and GEMPaint with the 520ST because the software giant failed to deliver on time.

The company has now come up with replacements in the form of 1st Word, a word processing package from Cambridge based GST, and DB Master One, a business database from USA's Stonemaster.

We made this decision based on Digital Research's failure to supply us with a suitable product by the agreed date," Rob Harding, Atari UK's sales manager, told *Atari User*. "So we had to make other arrangements.

However Rob Harding insists that the new software will in no way detract from the ST bundle offer.

"1st Word is a superb GEM

Five get converted



BUDGET software house Blue Ribbon has converted five of its established range for the 48k Atari – Castle Assault Diamond Mine 1 Nightmare Maze Screwball and Darts

All cost £2 50 each on cassette or £9 95 for the five on disc

The first two games have similar goals In Castle Assault the task is to collect gold while avoiding a menacing menagerie of meanies In Diamond Mine it is to gather precious stones from tunnels and shafts while avoiding a hoard of obstructive bugs

Cups of coffee have to be found escape keys collected and monsters avoided In Nightmare Maze through which the player must guide Sleepy Joe

In Screwball the player is given 60 seconds to change the colour of all the squares in the grid This time the assailants are the Black Bugs

Last of the five games is Darts This includes three programs – 501 Round the Board and Cricket

'This will be the year of Atari'

ATARI S 8 bit user base in the UK has now reached 400 000 thanks to High Street giant Dixons selling almost all the remaining stock of the now defunct 800XL

In all close to 100 000 of the machines are believed to have been sold during the run up to Christmas alone

And Atari distributors and dealers couldn t be more pleased with the prospects for 1986

This will be the year of Atari says Tony Deane of Silica Shop For the sale of all those XLs has helped create an enormous marketplace for software and peripherals.

Competitive

And the 130XE is also going incredibly well even to the extent where we actually ran out of stock at one time recently So everyone is doing very nicely – including the customers

After all the larger the market out there the more keen the companies are to get into it so prices become even more competitive

to deliver makes Atari drop GEM

based word processor with full windowing and drop down menu facilities says the company sales boss

And we are including a database with the 520ST rather than GEMPaint because after consulting a number of people it is very clear that the ST is being sold in a professional and business environment where a database will be more useful

Atari has also revealed that it is to include two further free pieces of software in the ST bundle – Megaroids a version of the Asteroids arcade game and Doodle a graphic painting package

We believe that these will make the 520ST an even stronger overall total package he said

All current ST owners are now being requested to contact their dealers who will supply them with the new software free of charge

Meanwhile just what happens to the Atari versions of GEMWrite and GEMPaint when they do become available is the centre of some controversy

According to Digital Research s vice president Paul Bailey there is every likelihood they will still subsequently be bundled with the 520ST

Now we appreciate the fact we were a month late in



Rob Harding Even stronger package now

delivering for appraisal he told *Atari User* But there is nothing that says they won t be eventually bundled with the ST

However Atari doesn t seem to agree

As far as we are concerned the deal is now dead a spokesman said

When informed of this Paul Bailey commented If that is the case we ll market it ourselves to Atari users

Software to fight heroin

A TRIO of software houses involved in the Atari market have joined forces in the fight against heroin addiction

Gremlin Graphics, Activision and US Gold have



all donated programs to 'Off the Hook', a games compilation tape, the proceeds from which will be used in the war on drugs

Launched by the home computer games industry at its annual dinner, it is hoped to raise more than £100,000 through the sale of the tapes campaign

Artist David Rowe's picture (above) is being used to link up with the anti heroin campaign This will involve the sale of a limited edition of some 70 colour prints

Fleet Street gets bigger

MIRRORSOFT is working on an implementation of its Fleet Street Editor program which it claims will turn the 520ST into a fully operational photocomposition workstation

Due for an early summer release the ST version is still under development

So far the company is keeping mum about the program s proposed features and price – except to say it is aimed at both professional and hobbyist markets

SOFTWARE EXPRESS

COMPUTER SYSTEMS LIMITED

BC s Quest for Tires	(R)	14 95
Dds Well	(R)	14 95
Alternate Reality	(D)	39 95
Spell Breaker	(D)	CALL
Acrojet	(D)	34 95
Gunship	(D)	34 95
Silent Service	(D)	34 95
Bounty Bob Strikes Back	(R)	33 95
Paperclip Special Offer	(D)	59 95
Homepak	(D)	39 95
Omnitrend s Universe	(D)	99 95
Synfile +	(D)	49 95
Syncalc	(D)	49 95
Syntrend	(D)	39 95
Fighter Pilot	(C/D)	9 95/12 95
Super Zaxxon	(C/D)	9 95/14 95
Kennedy Approach	(C/D)	14 95
Mercenary	(C/D)	9 95/14 95
Brimstone Interactive Disk Adventure		39 95
Essex Interactive Disk Adventure		39 95
Mindwheel Interactive Disk Adventure		39 95
Party Quiz	(D)	39 95
(Education/General Knowledge Data Disks		19 95)
D S S Toolkits	(D)	27 95

Haba Dex	59 95
Haba Hippo C	74 95
Haba Writer	74 95
Hippo Almanac	34 95
Hippo Backgammon	39 95
Hippo Simple (Database)	49 95
A Mind Forever Voyaging	44 95
Cut Throats	39 95
Deadline	22 95
Enchanter	39 95
Hitchhikers Guide to the Galaxy	28 95
Infidel	44 95
Planetfall	22 95
Seastalker	22 95

Spellbreaker	48 95
Sorcerer	44 95
Starcross	48 95
Suspect	44 95
Suspended	49 95
Wishbringer	39 95
Witness	39 95
Zork I	22 95
Zork II	44 95
Zork III	44 95
K Ram	29 95
K Seka	49 95
K Spread	49 95
Hex	39 95
PC Intercomm (VT100 Terminal Emulator)	129 95
The Final Word	150 00
Flipsides	19 95
Lands of Havoc	19 95
M/Disk + Soft Spool	19 95
Mudpies	19 95
Pascal	99 95
Bratacas	34 95
Ultima II	57 95
Module 2	99 95
Andra (Word Processor)	To be announced
Flexifile (Database)	59 95
Ram Disk/Printer Spooler	24 95
ZKUL/West (Adventure Twin Pack)	24 95

NOW AVAILABLE!

ST COLOUR MONITORS
PRINTER LEADS
1MB 3 5" DRIVES
½MB 3 5" DRIVES
ST DESK STANDS

MAGAZINES

ANTIC 3 00 ANALOG 3 00 ST USER 1 00 ATARI USER 1 00
PAGE SIX 90p
SOME BACK ISSUES STILL AVAILABLE

(A COMPREHENSIVE RANGE OF BOOKS AVAILABLE).

514-516 ALUM ROCK ROAD
ALUM ROCK
BIRMINGHAM B8

HOTLINE
(021) 328 3585

PLEASE NOTE ALL ORDERS TAKEN WITH EITHER FULL PAYMENT OR DEPOSIT WILL NOT BE CLEARED UNTIL YOUR ORDER IS READY TO BE DESPATCHED

Access VISA

"Please send me your catalogue."

NAME

ADDRESS

TELEPHONE

Don't miss the BIG Atari event of 1986!

ATARI COMPUTER SHOW



For the first time Atari UK and all the major suppliers of Atari hardware and software are pulling out all the stops to make the first-ever Atari Computer Show the top event of the year

Everyone who's anyone in the Atari world will be there. Already many third party suppliers are planning to use the show as a launching pad for products still on the drawing board

If you're a long-standing Atari user the show will bring you right up to date on all the exciting developments now taking place in the ever expanding Atari world

And if you're one of the many thousands of newcomers to Atari computing it will open your eyes to the vast selection of Atari hardware and software that is now available for the whole Atari range

It's a show you cannot afford to miss!

Champagne Suite, Novotel, Hammersmith, London W6



The Atari Computer Show will be a shop window for Britain and something that not even our American cousins have achieved – ***Mike Reynolds, Sales Director, Software Express***

It will provide us with an opportunity to show the Atari consumer just how much good software there is in the marketplace – ***Tony Deane, Marketing Director, Silica Shop.***

There will be an exciting range of new products on display at the show – ***Rob Harding, Sales Manager, Atari UK***

Save £1 a head – and miss the queues! – by sending for your tickets now!

Please supply

☐ Adult tickets at £2 (save £1) £ _____

☐ Under 16s tickets at £1 (save £1) £ _____

Total £ _____

☐ Cheque enclosed made payable to Database Publications Ltd.

☐ Please debit my credit card account

Access ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Visa ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Admission at door: £3 (adults) £2 (under 16s)

ATARI COMPUTER SHOW

Advance ticket order

Post to: Atari Show Tickets, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

Name

Address

Signed

PHONE ORDERS RING SHOW HOTLINE. 061-480 0171

Please quote credit card number and full address

AT 2

The Turtle



SOL GUBER looks at list processing on the Atari using Logo

A PRECURSOR of Logo was the language Lisp, which was used for LISt Processing and had a very unusual property — the statements that were used to run a program were themselves a list.

Thus Lisp could manipulate itself in ways that are only dreamed of in other languages. It is for this reason that Lisp is still around today since it is an ideal language for use in artificial intelligence work. List processing is still part of Logo and a very important part of it.

Let me digress and explain some of the Lisp derived commands that are still found in Logo. First of all variables are very difficult to handle in Logo. However lists are a necessary part of the language.

Commands like SET Position expect a list of two numbers so that the turtle will know where to move. There are strange commands like BUTLAST and BUTFIRST that will take a list and give back another list that is the same except that the first item in the list is gone (BUTFIRST).

Lists can be made up of other lists. Lists can be put together and taken apart. There is even a special command called NUMBER that tells how many members are in a list.

One further digression. I have been taking about lists and have not shown any examples of one. In Logo, lists are enclosed in brackets []. It could be a list of names such as [Rebecca Lauren Gabriel Daniel]. Or a list of numbers like [3 6 2 8]. Or a mixed list with the first element in the list itself being a list as in [[1 3 7 2] Rebecca Gabriel Jason].

Let us call this list ABC. ABC has four members in it. If we asked LOGO to NUMBER ABC and PRINT the answer it would give us 4. If we asked LOGO to BUTFIRST ABC then LOGO would give us [Rebecca Gabriel Jason]. If we asked for FIRST ABC then it would give us [1 3 7 2]. Several other commands that can be used for manipulating lists include SE WORD and CHAR.

You are probably asking yourself how does this relate to anything that is fun or useful. When a command is written in Logo it is written as a list. The command can be manipulated and changed and then run. Logo does not care if it is a list or a command.

What we are going to do is write a program to make the turtle draw what is known as a Dragon curve. This is a mathematical formula that is very recursive and in effect bites its own tail. Every dragon curve will become more complicated until it will fill the screen but every new dragon curve is related to the old one through a simple procedure.

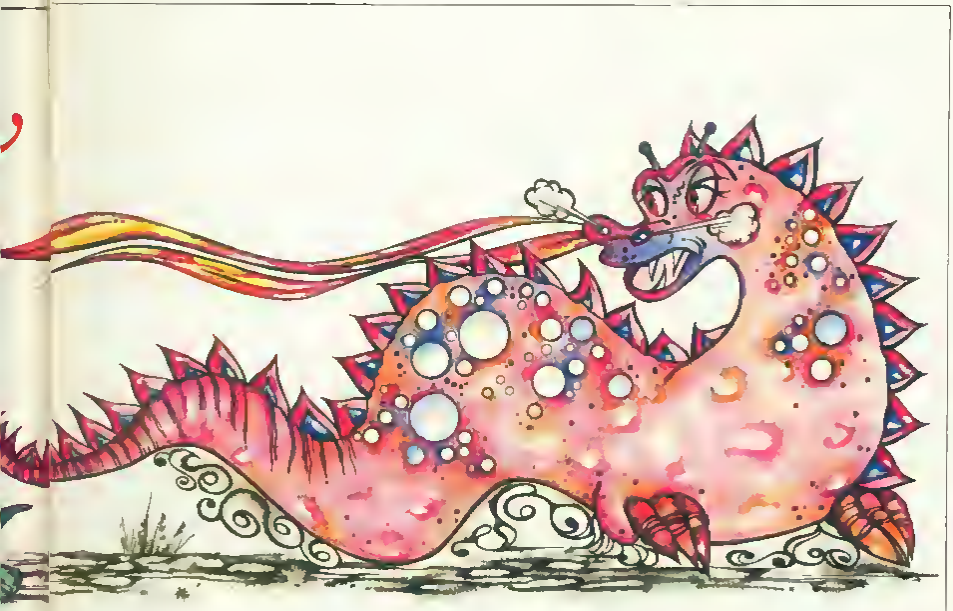
The dragon curve is a method of making a line that fills up a space. The classical dragon curve will not touch itself at more than two points and will never cross itself. The program is made up so that the classical dragon curve is drawn or you can start the dragon curve with your own formula.

To make the turtle draw a dragon curve is very easy. The classical dragon curve of order 1 is L. This means that the turtle walks forward so far and then makes a Left turn and walks the same distance again. Order 2 takes the Order 1 curve adds an L to it and then goes backwards through the old one reversing every L to a R and every R to an L. Thus the Order 2 curve is L-L-R. This means that the turtle walks forward, makes a left turn, walks forward, makes a left turn, walks forward, makes a right turn and then walks forward again.

The Order 3 curve is make from the Order 2 curve. It is LLR-L-L LRR again reversing the Ls and Rs in a backward direction. Order 4 is LLRLLRR-L-LLRRLRR and so forth. It is very easy to teach the turtle to walk this path and as the paths become more complicated the path begins to look like a Chinese dragon.

Back to list processing. Let us assume that there is a list with the instructions for a turtle on how to walk to make a dragon curve. If it is a list then it can be manipulated and a new list made that is the next order of complexity. Then the next order of complexity can be made.

Let us see how this is done. There are procedures that are used to



...and the Dragon

manipulate this list of the directions.

First let me explain several of the less common Logo commands – SE (SEntence), RUN and COUNT. I will also explain more about the recursiveness of Logo.

SE is an easy one. It takes the elements in its inputs and makes a list out of them. For example SE [1 2 3] [REBECCA LAUREN GABRIEL] would give an output of [1 2 3 REBECCA LAUREN GABRIEL]. This is very useful for making lists up. It is different than if we LIST them together because then we would get [[1 2 3][Rebecca Lauren Gabriel]].

The difference is more evident if we use the NUMBER command to determine the number of elements in the list. If we NUMBER the first list made by using SE the result would be 6. If we NUMBER the second list made by using LIST the result is 2.

The next strange command is RUN, which takes the next list and tries to make it perform an action. If all the commands in the list are defined the proper action will be done. This is the heart of any Lisp program: the making of a proper list and then RUNning it.

Another useful command is BUTFIRST and FIRST. Let us use the list [1 2 3 4]. The FIRST member is [1] and BUTFIRST is [2 3 4]. There is a corresponding set of commands called LAST and BUTLAST which take the list and everything but the last member in a list.

Finally there is the command WORD which makes up a word out of its inputs and CHAR which puts out a character from a number value.

Two other commands are used in the program. RC (Receive Character) outputs the next character read from the keyboard and RL (Receive Line) gets a whole line that is typed and ended with RETURN.

Let me go through the program. The main command is DRAGON. It MAKES STEP 50 and then does procedure START, which asks if you want to make your own dragon.

The next statement is an IF test to determine if the character typed is an N. If it is, then DRAG is made equal to [L] and a classical dragon is drawn. If the character is not N then a line is printed to tell you to type Rs and Ls to make your own formula for a dragon.

DRAG is made equal to the value from RL (Receive Line). Then there are two checks to decrease the size of

STEP so that the dragon will fit on the screen. The program then returns back to DRAGON. Window is called to make the field larger so that the turtle will go out of bounds rather than make a poor dragon curve. Then DRAW is repeated 10 times.

DRAW is the main procedure. It calls most of the other procedures and makes the turtles draw the Dragon curve correctly. The first thing that DRAW does is check to see if a key has been pressed (KEYP). If it has then the program stops.

The next thing it does is make a new variable equal to DRAG. If you remember the convantions of Logo a " before a variable sign fies the name and a : before a variable signifies its value. So MAKE "WORK :DRAG means make the variable WORK equal to the value of DRAG.

The next step is to put an L on the end of WORK. This is done by making WORK equal to the SEntence of WORK and CHAR 76 (L).

Next the recursive procedure REDO is called. This means that somewhere in REDO, REDO uses itself. The only way that this can work and not turn into an endless loop is if there is a check somewhere to stop the loop. The first statement does just this. IF 0=COUNT :DRAG [STOP] stops if there are no more values in DRAG, then stop.

The next statement makes the modifications for the next order of the dragon curve. IF R is the last member of DRAG then MAKE "WORK the value of work and CHAR 76 (L) otherwise make WORK equal to WORK and CHAR 82 (R). The next line makes DRAG equal to BUTLAST DRAG and the REDO does it again. Each time DRAG goes through REDO it becomes shorter and finally it will fall out of REDO and return.

Back in DRAW, DRAG is made equal to WORK. The screen is cleared (CS) and TELL turtle 0 to go to work. The next statement is the heart of the program. It is RUN WORK. It says to take the list found in WORK and RUN it.

As we have seen previously WORK is make up of a series of Rs and Ls. And now we are telling the program to RUN this?

There are still some procedures that we have not gone through yet and two of these are R and L. There is a procedure called R that calls WALK and gives it two values 90 and STEP. The procedure L calls WALK with the values −90 and STEP. WALK takes these two values and makes a RIGHT turn of the number of degrees and then walks FD STEP times.

What we have done is defined R and L so that it makes sense in this program. Then when we tell the program to RUN WORK what it will do is take the Rs and Ls and make a pattern on the screen.

The rest of the program is rather straightforward. Once the turtle 0 has made the pattern. SET_UP tells all four turtles to simultaneously make the same pattern using another RUN WORK command.

All the turtles are oriented at 90 degree angles so that there will be four dragons tail-to-tail on the screen. After this is done REDUCE makes STEP smaller if it is not less than 4. Then the program falls back to DRAGON.

One more set of routines is used in this program and it was not added at any specific spot. One of the lacks of Logo is that there is not a screen dump routine written specifically for it that will work with any sort of printer. I have written a set of procedures that will put a screen dump on a printer but it needs to be modified to run on each individual printer.

First let's see how the screen is set up in memory. The area called screen memory contains information on what will be put on the screen. Each byte of memory contains 8 bits and the system uses these two at a time to make the dots on the screen.

The turtle draws in what is known as Graphics 7 mode and each byte of memory corresponds to four dots or pixels on the screen. The bits taken two at a time say which colour is to be used for the dot and since two bits can only have the values of 00 01 10 11 (0, 1, 2, 3) this corresponds to which pen is used to make the dot.

What the screen dump does is take the eight bits and divide them into two parts. It then looks at each four bit part which contains the information about two pixels and decides which pattern it is. Since most printers cannot make colours all this routine does is determine if the pixel is lit or not. The four possibilities for two pixels are both dark, left dark—right lit, left lit—right dark and both lit. Since there are 160 pixels across the screen the two pixel pattern will correspond exactly to the 80 columns across the page and a screen dump can now be done.

Since every printer is different four procedures have to be modified to correspond to your printer. I have an NEC 8023 and the program was written for that model. However it is very easy to make the changes necessary for your printer.

The four procedures that need modification are BLANK, LEFTBLANK, RIGHTBLANK and SQUARE. These procedures send certain characters to the printer. To send material to the printer the SETWRITE command SETWRITE 8 must be done first. Then when BLANK is used it TYPEs the CHAR whose value is 32 into the printer. In most printers this is the value that is the blank character.

LEFTBLANK uses the CHAR 139 to put a half column of darkness on the printer. On printers like the 825 the value 24 is used. The Epson uses a 234 for this. SQUARE uses the value 136 to put a black square on the printer. The 825 uses a 162 and the Epson a 239.

On the 825 a 150 value will give a RIGHTBLANK. The Epson uses a 233. However the RIGHTBLANK for the NEC uses a more complicated routine to put a blank right on the printer.

The NEC does not have a special character for a half column with the right part partially filled and I had to make up my own. The NEC has something called pin addressing which can make up for this. Every pin in my dot matrix printer can be told whether to be in or out.

What I want for RIGHTBLANK is a character made up of four vertical columns of nothing and then four columns of full blackness. To do this I need to send to the printer the coding that sets of the proper coding for pin addressing (27 83) and then tell it that there will be eight numbers coming to be used (48 48 48 56) and then finally the coding for the actual printing (0 0 0 0 255 255 255 255). I have thus ganarated my own character which has the printing that I want.

One other need is to have the lines closer together to make the picture appear more realistic. There is a procedure called SPACING that changes the spacing to 8/72 of an inch. This will have to be modified to your own printer also. The Epson uses

```
TO SQUARE
TYPE CHAR 135
END

TO LEFTBLANK
TYPE CHAR 139
END

TO BLANK
TYPE CHAR 32
END

TO WRITE :A
IF 0 = :A [BLANK STOP]
IF 4 > :A [RIGHTBLANK STOP]
IF 0 = REMAINDER :A 4 [LEFTBLANK STOP]
SQUARE
END

TO PIXEL
MAKE "SPOT  EXAMINE :SCREEN
IF 0 = :SPOT [BLANK BLANK STOP]
WRITE INT  :SPOT / 16
WRITE REMAINDER :SPOT 16
END

TO LINE
REPEAT 48 [PIXEL MAKE "SCREEN :SCREEN + 1]
END

TO RIGHTBLANK
TYPE CHAR 27 TYPE CHAR 83
TYPE CHAR 48 TYPE CHAR 48
TYPE CHAR 85 TYPE CHAR 54
TYPE CHAR 8 TYPE CHAR 0
TYPE CHAR 8 TYPE CHAR 8
TYPE CHAR 255 TYPE CHAR 255
TYPE CHAR 255 TYPE CHAR 255
END

TO SPACING
TYPE CHAR 27 TYPE CHAR 84
TYPE CHAR 49 TYPE CHAR 54
END

TO PRINTER
MAKE "SCREEN 256 *  EXAMINE 14273 +  EXAMINE 14272
SETWRITE "P1 SPACING
REPEAT 96 [LINE]
SETWRITE []
END

TO L
WALK  90 :STEP
END

TO DRAGON
MAKE "STEP 58
START 65
REPEAT 10 [DRAW1]
END

TO START
PRINT [DO YOU WANT YOUR OWN DRAGON Y   N]
IF EQUAL? RC "N [MAKE "DRAG [L] STOP]
PRINT [   WILL NEED TI T PE P   AVE   ]

PRINT [WITH A SPACE BETWEEN EACH ONE] MAKE "DRAG RL
IF 5 < COUNT :DRAG [MAKE "STEP :STEP / 1 2]
IF 8 < COUNT :DRAG [MAKE "STEP :STEP / 1 2]
END

TO DRAW
IF KEYP [STOP]
MAKE "WORK :DRAG
MAKE "WORK BE :WORK CHAR 76
REDO
MAKE "DRAG :WORK
TELL 0
CS
RUN :WORK
WAIT 85
SET_UP RUN :WORK
REDUCE
END

TO REDUCE
IF 4 > :STEP [STOP]
MAKE "STEP INT  STEP / 1 3
END

TO REDO
IF 0 = COUNT :DRAG [STOP]
IF EQUAL? "R LAST :DRAG [MAKE "WORK SE  :WORK CHAR 72]  ML F
"WORK SE :WORK CHAR 82]
MAKE "DRAG BUTLAST :DRAG
REDO
END

TO SET_UP
TELL [0 1 2 3] PU HOME CS
TELL 1 SETH 0 SETPC 0 39
SETPN 0
TELL 0 SETH  90 SETPC 1 15
SETPN 1
TELL 2 SETH 90 SETPN 1
TELL 3 SETH 180 SETPC 2 87
SETPN 2
TELL [0 1 2 3]
PD
END

TO WALK :A :B
RIGHT :A
FD :B
END

TO R
WALK 90 :STEP
END

MAKE "NORD [A]
MAKE "A0 []
MAKE "RBLK [27 85 0 0 0 0 0 0 0 0 255 255 255  55]
MAKE "L1 [P]
MAKE "P1 [R]
MAKE "SPOT 0
MAKE "START 64
MAKE "STEP 5
MAKE "  PEEK [
```

Dragon and some procedures

a [27 65] coding

Thus PRINTER is called to do a screen dump It determines the first spot in memory that is the screen memory by checking the pointer at 14273 and sets this value to SCREEN It starts the printer and changes the SPACING It then calls LINE 96 times to print out all 96 lines of the screen and finally turns off the printer LINE calls PIXEL 40 times and after each call increments SCREEN

PIXEL finds the value at the location SCREEN and separates it into two parts which it sends to WRITE if it is not zero If it is zero two BLANKS are sent and the procedure returns to LINE WRITE determines if it is a BLANK A RIGHTBLANK a LEFTBLANK or a SQUARE coding is to be sent to the printer It then returns to PIXEL

PRINTER is *extremely* slow It will take almost five minutes to print out the full screen I will control myself and make no bad puns about turtles

There are facilities to make the screen dump in machine language but that is not the purpose of this program If I were to add it, the step would be in DRAW as follows IF STEP < 5 THEN PRINTER

This program is an example of a program writing its own program – the major characteristic of Lisp It does not care if the list contains names or numbers or instructions It is treated just the same and stored just the same Thus an instruction list can be modified when needed and when checked by external observations which make this the language of choice for artificial intelligence work



THE 520ST. OVER QUAI

AVON BRISTOL
Computer Buyhaus
AVON BRISTOL
Ladys
AVON BRISTOL
Radford Hi Fi.
BEDS BEDFORD
Bedford Computers.
BEDS LUTON
Hobbyte Ltd
BEDS LUTON
Ladys.
BELFAST
CBM Micro-Computer Services Ltd.
BELFAST
Computer All Ltd.
BELFAST
Education Company Ltd.
BELFAST
Ideal Radio
BELFAST
NPO
BERKS READING
HMV Micro Shop
BERKS. READING
Ladys.
BERKS SLOUGH
Ladys
BERKSHIRE SLOUGH SL2
Silicon Chip.
CAMBS CAMBRIDGE
Cambridge Computer Store
CAMBS LAMBRIDGE
Ladys
CAMBS PETERSOROUGH
Ladys
CENTRAL FALKIRK
Micropius
CHESHIRE CHALTER
Ladys.
CHESHIRE CREWE
Wenthers TV
CHESHIRS WARRINGTON
Warrington All Computers
CLEVEDON WILMELOW
Fairhurst Instruments Ltd
CLWYD WREXHAM
Micro Computer World.
CLWYD WREXHAM
Micro Computer Centre
COLCHERY
Hornsby Brothers
CO DOWN WARREN POINT
Valona's Ltd.
CO DURHAM
DARLINGTON
Darlington Computer Shop.
DERBYSHIRE
CHESTERFIELD
F.W. Electronics
DEVON EXETER
Ladys.
DEVON PLYMOUTH
Ladys
DEVON PLYMOUTH
Syrinx Ltd.
DORSET BOURNEMOUTH
Lansdowne Computer Centres.
DORSET POOLE
Lansdowne Computer Centres.
ESSEX COLCHESTER
Colchester Computer Centre.
ESSEX COLCHESTER
Computer Complete
ESSEX COLCHESTER
Logitech
ESSEX COLCHESTER
Ladys.
ESSEX HARLOW
Ladys
ESSEX ROMFORD
Ladys
ESSEX SOUTHEND
Ladys.
ESSEX SOUTHEND
Estuary Computers
ESSEX WESTCLIFF ON SEA
Sterling Educational
FIFE GLENROTHES
Computer Services (Scotland) Ltd
GLOUCESTER CHELTENHAM
Ladys.
GLOUS GLOUCESTER
Ladys.
GRAMPIAN ABERDEEN
Ladys
GRAMPIAN ABERDEEN
Microlash.
GT MANCHESTER BOLTON
Computer Centre.
GT MANCHESTER
FAILWOODFIELD
Mighty Micros
GT MANCHESTER
MANCHESTER M3
Ladys.
GT MANCHESTER
MANCHESTER M1
Ladys.
GT MANCHESTER
MANCHESTER
Lewis Ltd (Sound & Vision).
GT MANCHESTER
MANCHESTER
NEC Comp/Graphics.
GT MANCHESTER STOCKPORT
New Mills Micro Centre
MERSEYSIDE LIVERPOOL
Lewis Ltd (Sound & Vision)
GWENT BRECON VALE
Computerbility
HANTS PORTSMOUTH
Micro-Inside.
HANTS SOUTHAMPTON
AMR Systems Limited.
HANTS SOUTHAMPTON
Ladys
HERTS ST ALBANS
Hobbyte Ltd.
HERTS WATFORD
Ladys
HIGHLAND INVERNESS
Nova Computers
HUMBERSIDE HULL
Computerware
HUMBERSIDE HULL
Goldings Computer Services.
HUMBERSIDE HULL
Transform Ltd.
EAST BRIXLEY HEATH
Ladys.
KENT BROMLEY
Ladys.
KENT MAIDSTONE
Kent Microcomputers.
KENT MAIDSTONE
Ladys
KENT ORPINGTON
Leger Computers
KENT SEVENOAKS
Chalk Hill Computers &
Office Supplies.
KENT SWANLEY
Swanley Electronics.
KENT [illegible]
Rhino Shop
KENT WELLING
K E C M. Computers
LANCS ACCRINGTON
PV Micros
LANCS BLACKPOOL
Lewis Ltd (Sound & Vision)
LANCS BOLTON
Computer World
LANCS BURNLEY
Eyres And Pecon
LANCS DARWEN
Orghams Micro Shop
LANCS LANCASTER
Cattle Lodgecare
LANCS LANCASTER
Oglens Computer Services
LANCS OLDHAM
Home & Business Computers.
LANCS PRESTON
Ladys.
LEICS HINCKLEY
Leigh Computer Systems
LEICS LEICESTER
Discreation Computers.
LEICS LEICESTER
Lewis Ltd (Sound & Vision)
LEICS LEICESTER
Micro Hi Fi Ltd.
LEICS LEICESTER
Ladys.
LEICS LOUGHTON
Data Nest
LINCS GRANTHAM
Oakland
LONDON BECKLEY
Horseview Video
LONDON NW4 Ladys.
LONDON NW8 Logosoft.
LONDON SW18 LEWISHAM
Ladys.
LONDON W8 EALING
Ladys.
LONDON W8 MARBA VALE
Micro Mondo Ltd.
LONDON W1 Computers Ltd.
LONDON W1 Ladys.
LONDON W1 Ladys.
LONDON W1 Micro Anvils
LONDON W1 Rikes Shop
LONDON W1 Selfridges.
LONDON W1
Computers of Wigmore St.
LOTHIAN EDINBURGH
Ladys
LOTHIAN EDINBURGH
Silicon Centre
LOTHIAN EDINBURGH
The Games Master Ltd.
MERSEYSIDE LIVERPOOL L1
Ladys.
MERSEYSIDE LIVERPOOL L2
Ladys.
MERSEYSIDE SOUTHPORT
Central Studios
MERSEYSIDE ST HELENS
Micronic Computers
MIDDLESEX ENFIELD
Jennings Stores Ltd.
MIDDLESEX ENFIELD
Ladys.
ESSEX NORTHWOOD
Screens.



THE ATARI 520ST Personal Computer has a list of qualifications as long as your arm. With a powerful 16 bit processor and 512k of memory linked to high resolution graphics and 512 colours its work is fast, clear and sharp on your screen, no matter how demanding the task.

Controlling the 520ST is easy through its mouse and unique operating system incorporating GEM desk top manager, whilst its eleven peripheral connectors including MIDI interface enables it to mix and communicate easily with other computer products.

The ST which presents itself in smart modern styling comes with powerful BASIC

L IFIED AND UNDERPAID.

plus Logo programming languages, a word processor and drawing programme, yet costs only £652* including disc drive and black and white monitor.

Why? Because at Atari we bring up our products to work hard for their living.

ATARI®

Power Without the Price™

*This price is exclusive of VAT

GEM is a registered trademark of Digital Research

MIDDLESEX PINNER
MIDDLESEX POTTERS WOOD
NORFOLK GREAT YARMOUTH
NORFOLK NORWICH
N YORKSHIRE YORK
N YORKSHIRE YORK
N YORKSHIRE RIPON
NOTTS HUCKNALL
NOTTS MANSFIELD
NOTTS NOTTINGHAM
NOTTS NOTTINGHAM
NORTHANTS NORTHAMPTON
NORTHANTS NORTHAMPTON
NOTTS REDDINGTON
OXON READING
OXON OXFORD
OXON OXFORD
ORKNEY STROMNESS

PERTHSHIRE BLACKFORD
SHETLAND LERWICK
S GLAMORGAN CARDIFF
S GLAMORGAN CARDIFF
S GLAMORGAN CARDIFF
S YORKSHIRE DONCASTER
S YORKSHIRE ROTHERHAM
S YORKSHIRE SHEFFIELD
S YORKSHIRE SHEFFIELD
STAFFS STOKE-ON-TRENT
STAFFS STOKE-ON-TRENT
STRATHCLYDE GLASGOW
STRATHCLYDE GLASGOW
STRATHCLYDE GLASGOW
SUFFOLK SUDBURY
SURREY CROYDON
SURREY FARNHAM
SURREY GUILDFORD
SURREY KINGSTON

SURREY LEATHERHEAD
SUSSEX BRIGHTON
SUSSEX BRIGHTON
SUSSEX BRIGHTON
SUSSEX CRAWLEY
SUSSEX WORTHING
TAYSIDE DUNDEE
TAYSIDE PERTH
TYNE AND WEAR GATESHEAD
TYNE AND WEAR
NEWCASTLE UPON TYNE
WARWICKS LEAMINGTON SPA
WARWICKS NUNEATON
WARWICKS NUNEATON
W MIDLANDS BIRMINGHAM
W MIDLANDS BIRMINGHAM
W MIDLANDS BIRMINGHAM
W MIDLANDS COVENTRY

W MIDLANDS COVENTRY
W MIDLANDS DUDLEY
W MIDLANDS
WOLVERHAMPTON
WORCS KIDDERMINSTER
WORCS REDDITCH
W GLAMORGAN SWANSEA
W/SUT LOTHIAN
LIVINGSTONE
W YORKSHIRE BRADFORD
W YORKSHIRE HALIFAX
W YORKSHIRE
HECKMONDWIKE
W YORKSHIRE
HUDDERSFIELD
W YORKSHIRE LEEDS
W YORKSHIRE LEEDS
W YORKSHIRE LEEDS
W YORKSHIRE LEEDS

NOW FOR ASSEMBLY LANGUAGE

Part II of STEPHEN WILLIAMSON's series on how to produce your own machine code games

NOW let's look at the assembly language version of Alien Attack, the game developed with the use of the RAW assembler from last August's issue of *Atari User*.

The assembler puts machine code into memory after analysing assembly language mnemonics contained within DATA statements. Program 1 is a list of the DATA statements used to compile the first part of the game.

The mnemonics used by RAW are fairly standard so if you are used to using a different Atari assembler you should have no difficulty.

There may be some minor differences for example the RAW assembler recognises Indexed instructions such as STA 37682,Y whereas most assemblers replace the full stop with a comma to give STA 37682,Y.

In case you are unfamiliar with assembly language or only have a limited knowledge of the system the adjacent panel gives a brief introduction to the subject and a list of the assembly language mnemonics used by Alien Attack are given elsewhere.

To keep things simple I have not used all the 6502 instruction set that is available to the programmer nor have I used the hex number system.

Whereas Basic supports a large number of variables that can be used to store DATA the 6502 chip can only handle two registers X and Y and one accumulator A. It is therefore necessary at various points in a machine code program to store DATA in memory locations so that it can be retrieved later in the program.

Addresses in which Alien Attack DATA are stored in this way I refer to as stores. It is helpful to allocate areas of memory well away from the main program to act as stores.

In this way whenever you come across them in machine code programs you can recognise the addresses at once as being stores.

There are several locations in zero page addresses 0 to 255 that are not used by the operating system and I have used some of these as stores. For example the current horizontal position of the ship is stored at address 204.

There is also a block of memory free at page 6 addresses 1536 to 1792 and I have also allocated some



6502 ASSEMBLY LANGUAGE

THE 6502 chip supports one accumulator, A, and two registers, X and Y. X, Y and A can be thought of as similar to variables in Basic, but with some important differences. They can hold any number between 0 and 255. Values can be added to or subtracted from the accumulator without any difficulty, though multiplication and division are more complex.

The X and Y registers can only be increased or decreased by one during any given operation. X and Y registers can be used as indexes. Where an address is followed by X or Y this indicates that this is an indexed operation.

For example, STA 37682,Y means store the contents of the accumulator in address 37682 plus whatever value is held in the Y register. Thus if Y holds a value of 10 and A a value of 100, then 100 is stored at address 37692 (37682+10).

Instructions followed by # mean that the operation is carried out in the immediate mode. Whatever is followed by the # sign is treated as a number and not an address. For example LDA#16 means load the accumulator with a value of 16 – this is similar to the Basic command A=16 – whereas LDA 1536 means load the accumulator with whatever value is stored at address 1536.

Instructions such as BEQ or BNE are branching instructions. If a branch instruction is followed by a number between 0 and 127 the program jumps forward. Followed by 128 to 256 the program jumps backwards. For example, the routine CMP 15, BEQ 13 means compare the accumulator with 15 and branch if equal 13 bytes forward. The routine CMP 15, BEQ 236 again compares the accumulator with 15, but branches if equal 256-238 or 18 steps backwards.

A number followed by ,Z means that the number is an address in zero page (addresses 0 to 255). Thus STA 20,Z means store the contents of the accumulator at address 204.

```
100 REM ### ALIEN ATTACK ###
104 REM ### ASSEMBLEY LANGUAGE ###
170 REM ### by Stephen Williamson ###
190 DATA 200 33916,L04 #09,STA 53248,L
04 #844,STA 54279,L06 #5,STA 53273,L06
 #07,STA #09
190 DATA L04 #56,STA 1847,STA 1885,STA
 1845,L04 #8,STA 1446,L06 #315,STA 204
2,LAB #150,STA 208.Z
200 DATA .clr
210 DATA PL6,L04 #8,STA 207 Z,STA 238
1,A0F,A0K,A0F,A0F,A8F,A0F,A0F
220 DATA LAB #8,L06 #1,STA 53249 #,STA
 163K #,DEX,A0K 247,STA 208 Z,STA 239,
Z
230 DATA LBY #8,L06 #8,STA 37632,Y,STA
 37869 Y,STA 38144,Y,STA 38400 Y,STA 3
8690 Y,INY,B0E 239
240 DATA L06 #239,STA 704,L06 #59,STA
700,L06 A0K,STA 708,L04 #422,STA 707
250 DATA L04 #1,STA 53258
260 DATA .cont
270 DATA L04 53279,CMP #1 BC6 1,BTS,LD
A #8,STA 77
280 DATA JSR ship,JSR fire,JSR all,JSR
 all,JSR #13,JSR 401,JSR boom,JSR fire
,JSR coll,JMP cont
```

Listing 1



LINE TOTALS		
100 4200	140 5481	170 8489
110 14057	150 19211	180 1447
120 12791	160 11600	190 15706
140 11678	200 37681	200 2565
130 7871	690 29913	

of these as stores

It would perhaps have been enough to just use page 6 addresses, but I have included zero page addresses for demonstration purposes. Where memory is at a premium zero page addresses have the advantage of being only 1 byte long

Figure I is a list of the stores used by Alien Attack

The game is built up from a series of 12 short subroutines, each handling a different aspect of the game

The first is used only once for each game and initialises the game. The rest of the subroutines are labelled according to their function

The RAW assembler like most assemblers can handle up to 255 labels and this facility makes it much easier to write and edit machine code

Figure II provides a list of these

MNEMONICS USED IN ALIEN ATTACK

ADC	Add specified contents to accumulator
ASL A	Shift left one bit of accumulator
BCC	Branch if carry clear
BCS	Branch if carry set
BEQ	Branch if equal
BNE	Branch if not equal
CMP	Compare accumulator with specified contents
CPX	Compare X with specified contents
CPY	Compare Y with specified contents
DEX	Decreasa X by one
DEY	Decreasa Y by one
INX	Increase X by one
INY	Increase Y by one
JMP	Jump to specified address
JSR	Jump to subroutine and save return address.
LDA	Load accumulator with specified contents
LDX	Load X with specified contents
LDY	Load Y with specified contents
LSR A	Shift right one bit of accumulator
NOP	No operation
PLA	Pull accumulator from stack
RTS	Return from subroutine
SBC	Subtract specified contents from accumulator
STX	Store X in memory
STY	Store Y in memory
TAX	Transfer accumulator value to X
TXA	Transfer value of X to accumulator

204	Ship player horizontal coordinate
205	Ship player vertical coordinate
206	Alien 1 player horizontal coordinate
207	Alien 1 player vertical coordinate
208	Alien 1 player direction flag
209	Alien 2 player horizontal coordinate
210	Alien 2 player vertical coordinate
211	Alien 2 player direction flag
218	Alien 3 player horizontal coordinate
220	Alien 3 player vertical coordinate
221	Alien 3 player direction flag
1536	Ship missile fire flag 1 – on screen 0 – off screen
1537	Ship missile vertical coordinate
1538	Alien 1 missile flag 4 – on screen 0 – off screen
1539	Alien 1 missile vertical coordinate
1540	Alien 2 missile flag 16 – on screen 0 – off screen
1541	Alien 2 missile vertical coordinate
1542	Alien 3 missile flag 64 – on screen 0 – off screen
1543	Alien 3 missile vertical coordinate
1544	Stores X register during explosion routine
1545	Stores Y register during explosion routine
1546	Number of lives left
1547	Score (100s)
1548	Score (10s)
1549	Score (1s)

Label	Start address	Function
—	38916	Initialisation
clr	38960	CLEAR — Clears stores and performs further initialisation routines
cont	39039	Controls order in which sub routines are executed
del	39601	Delay loop
ship	39091	Controls movement of ship
al1	39216	Controls movement of alien 1
al2	39341	Controls movement of alien 2
al3	39459	Controls movement of alien 3
fire	39576	Detects press of fire button and controls movement of ship missile
bomb	39662	Controls movement of alien missiles
coll	39884	Detects if space ship is hit
kill	40134	Detects if aliens are hit

Figure II Subroutines

20	Clock
77	Attract mode clock
559	Affects size of playfield and PM resolution
632	Detects position of joystick 0 similar to STICK(0)
646	Detects if fire button has been pressed similar to STRIG(0)
704	Colour register of ship
705	Colour register of alien 1
706	Colour register of alien 2
707	Colour register of alien 3
710	Colour register of screen background
24640-24879	Top row of screen display
36864	PM Base address This address is allocated by the program Other programs using the PM system may use a different PM base address
37632-39680	Data for PM shapes stored here
53248	Horizontal position of ship
53249	Horizontal position of alien 1
53250	Horizontal position of alien 2
53251	Horizontal position of alien 3
53252	Horizontal position of ship missile
53253	Horizontal position of alien 1 missile
53254	Horizontal position of alien 2 missile
53255	Horizontal position of alien 3 missile
53256	Collision detection — ship missile to all aliens
53257	Collision detection — alien 1 missile to ship
53258	Collision detection — alien 2 missile to ship
53259	Collision detection — alien 3 missile to ship
53260	Collision detection — ship to aliens
53277	A 3 stored at this address switches on PM system
53278	0 stored at this address calls all collision detection addresses
53279	Detects if START SELECT or OPTION keys have been pressed 7 — No key pressed 6 — START key pressed 5 — SELECT key pressed 3 — OPTION key pressed
53760	Pitch sound channel 0
53761	Volume sound channel 0
53762	Pitch channel 1
53763	Volume sound channel 1
53768	Affects sound clocking and filtering Causes white noise explosion sound

Figure III Operating system addresses used by Alien Attack

labels and a brief description of what each subroutine does

Figure III is a list of the relevant address of the Atari operating system that the program uses Reference to this table will help in following the program

Alien Attack makes extensive use of the player missile graphic system In the following comments on the listing Player 0 is referred to as the ship with players 1 2 and 3 known as aliens 1, 2 and 3 respectively

PM is used as an abbreviation for Player Missile

INITIALISATION

Lines 180 and 190 initialise the game

180

ORG 38916tells the RAW assembler where to start storing machine code in memory 65 is stored at address 53260 This sets the size of all missiles to double normal size 144 is stored at address 54279 to tell the PM system that the PM base address is 36864

All the data for the PM shapes are stored from 36864 upwards 3 is stored in address 53277 to turn on the PM system 62 is stored at address 559 to give single line resolution PMs on a normal size playfield

190

16 is stored in the score stores 1547 1548 1549 to put the character zero in these stores A value of 5 is stored in address 1546 which holds the number of lives left To increase this number a higher one can be stored at 1546 118 is stored in address 204 and is the horizontal starting coordinate of the ship Similarly 150 stored at 205 is the vertical starting coordinate of the ship

CLEAR

Lines 200 to 250 perform further initialisation functions and clear many of the stores before the game starts and also after each wave of aliens has been hit

210

The machine code routines are called up from Basic by the command A=USR (38916) When the USR command is executed the number of parameters passed to the machine code routine is put onto the stack In the case of Alien Attack no parameters are actually passed but still a value of zero is put onto the stack

The instruction PLA removes the 0 from the stack as this information is not needed by the program This then leaves a two byte address at the top of the stack which is the return to Basic address 0 is put into the Alien 1 and 2 stores to clear them off the screen

The No Operation (NOP) instructions are useful in the developmental stage of a machine code program

Initially this section of memory held other instructions but were later not needed as they performed no useful function

Instead of re-writing the routine 8 NOP instructions are placed to erase the unwanted instructions This wastes eight bytes of memory but this is a negligible amount and the time taken to cycle through the NOP instructions is infinitesimal

220

A loop puts 0 in all the horizontal player and missile position registers and clears most of the stores

230

Another loop clears all the PM data area of any garbage that may have accumulated there

240

The colours of the players and missiles are set up in the colour registers according to the formula

colour x 16 brightness



250

A 1 is stored in address 53258 to set the size of Alien 2 to double size

CONTROL

270

Address 53279 is looked at to see if a function key has been pressed If START SELECT or OPTION has been pressed then the Atari exits from machine code and control returns to Basic

This routine is useful for de-bugging purposes during the developmental stage of machine code programs for it means that you can exit from machine code without having to press the Reset key which can often result in the program being corrupted 0 is stored at address 77 Without this routine the Atari would enter the attract mode after 10 minutes of playing Alien Attack

280

This line calls up all the subroutines in the order that the game requires Note that the fire routine is called twice This means that the ship missile travels at approximately twice the speed of the alien missiles

● *Next month we ll work through the remainder of the assembly language program*

Atari 520ST

Write GEM software for your Atari 520ST NOW!

TDI present TDI Modula-2/ST, the only Modula-2 compiler for the Atari 520ST Accessed through Atari GEM icons, and driven by mouse, Icons or keyboard input

TDI Modula-2/ST **£99.95**

The package: TDI Modula-2/ST comes complete with its own screen editor, linker and friendly GEM illustrated manual

Speedy error detection: The compiler is integrated with the editor in such a way that all compilation errors are stored and displayed one after another on the screen for the programmer to correct

Write GEM programs: The full GEM interface and graphics are supported by TDI Modula-2/ST GEM software can be developed with windows, mice, menus and graphics

Advanced user friendly language: TDI Modula-2/ST is the logical development of the Pascal language, (Pascal programmers will take only a few days to adjust) It is a highly productive language, producing fast, quality 32 bit native code

TDI, 29 Alma Vale Road, Bristol BS8 2HL.
Telephone (0272) 742796

Prices include VAT and P&P
Allow 28 days delivery

Post this coupon to: TDI Ltd, 29 ALMA VALE ROAD, BRISTOL BS8 2HL

Please send me ___ copies of TDI Modula-2/ST
Please tick credit card type
VISA/Barclaycard ☐
ACCESS ☐
Diners Club ☐

I enclose a cheque for £_____ or debit card _____
Card Expiry Date _____
Name _____
Address _____
_____
Postcode _____ Telephone _____

GEM is a trademark of Digital Research

SEE US AT THE ATARI USER SHOW STANDS 2 & 4

Compumart

AMAZING LIMITED OFFER!!
SAVE OVER £100.00!!

(Normal Price £250.00)

Atari 1027 Letter Quality Printer

ONLY £145.00 (Plus £3.00 P&P)

With FREE AtariWriter Word Processor

WE HAVE NOT GOT MANY LEFT
So order now to avoid disappointment!

** Plugs straight in – No Interface required **
*** Excellent Letter Quality Print ***
** SAVE £100!! **

TELEPHONE YOUR CREDIT CARD ORDER
OR SEND CHEQUES/P.O.'s TO:

Compumart (AU)
71 Gracedieu Road, Loughborough
Leics. LE11 0QF.
Tel: (0509) 262259

SEE OUR ADVERTISEMENT ON PAGE 31
FOR OTHER AMAZING ATARI DEALS

BOUNCE

By
ROLAND WADDILOVE

BOUNCE is an exciting, but frustrating game which is so simple that even the youngest Atari user will be able to play.

But be warned, you'll need plenty of practice and skill to reach the top level.

A ball rolls round the screen, bouncing off the walls. By pressing the fire button on your joystick, or any key, a block will be placed behind the ball.

What you have to do is trap the ball. It doesn't sound too difficult, but wait till you try it.

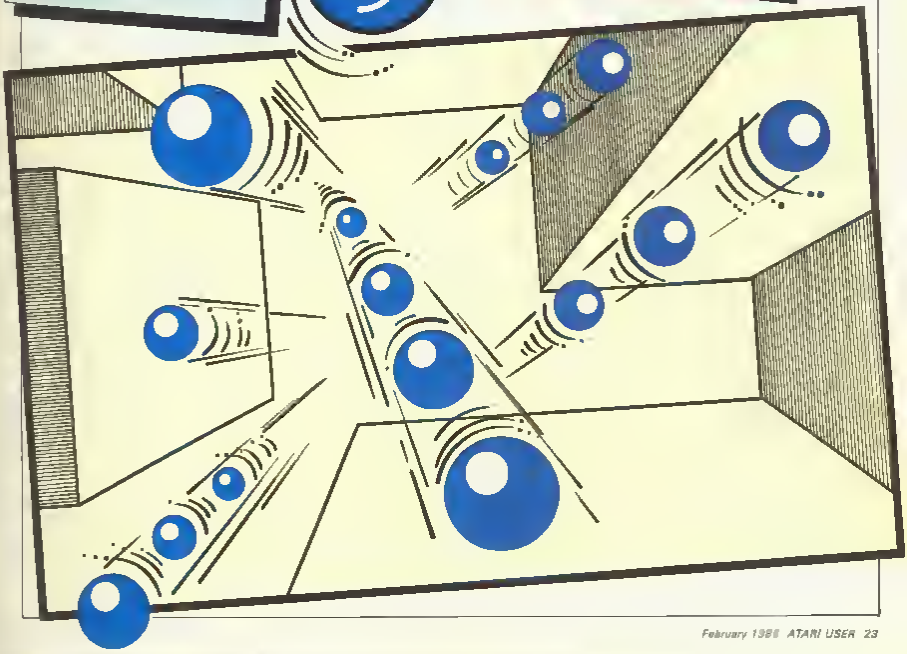
There's a very slight delay between pressing the button or key and the block being placed on the screen. This means you have to watch where the ball is going and press fire or a key just before the ball gets to the place you want the block.

There are 15 balls and the idea is to use as few blocks as possible to trap them. The smaller the number, the higher your rating at the end of the game.

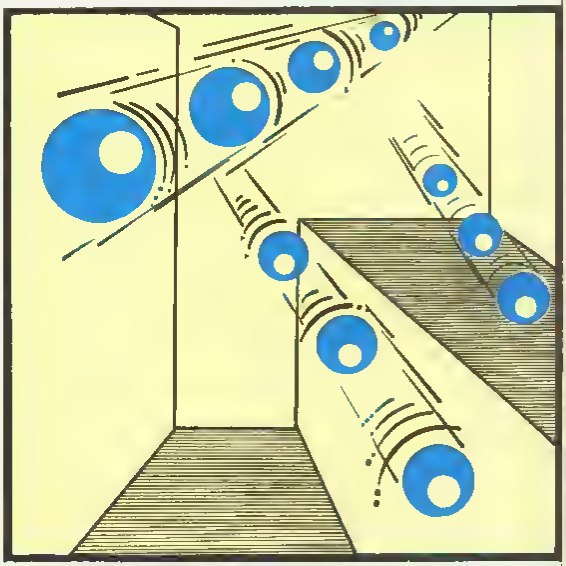
Handy hint: Build traps for the ball, wait for it to bounce in, then place a block behind it so it can't get out.

VARIABLES

SCR	Start of screen memory
P	Position of ball
D	Direction it's travelling
A(3)	The four possible directions
X	Number of blocks used



```
10 REM Bounce!
20 REM By G.B.Goodfellow
30 REM (c) Atari User
40 GOSUB 7000
50 GOSUB 5000
100 GOSUB 9000
110 GOSUB 8000
170 GOSUB 1000:IF PEEK(P-1)=0 OR PEEK(
P+33)=0 OR PEEK(P-33)=0 OR PEEK(P+33)=0
 THEN 170
200 IF BALL5 THEN 210
210 GOSUB 6000
300 GOTO 100
999 END
1000 REM ------ Move ball ------
1005 SOUND 0,0,0,0:IF P=P+P+P
1010 IF PEEK(P) THEN SOUND 0,100,10,10
 :X=-(X<0)*(PEEK(P+X)<>0):P=P+X:IF PEEK(P) T
HEN 1010
1000 IF PEEK(704)=206 AND STICK(0)=1 T
HEN POKE P,130:POKE 0,0:RETURN
1100 POKE 764,255:SOUND 0,200,10,10:PO
KE 0,67:POKE P,130*X=-X+1:RETURN
4000 REM ----- Set-up -----
4010 SOUND 0,0,0,0:GOSUB 21:SETCOLOR
 2,0,0:POKE 755,0
4020 ? #6;" ##### Pat:## ######"
4030 POSITION 6,6
4040 IF A(80 THEN ? #6;"[illegible]"
4050 IF X>49 AND X(150 THEN ? #6;"[illegible]"
4060 IF X>89 AND X(150 THEN ? #6;"[illegible]"
4070 IF X>145 AND A(200 THEN ? #6;"[illegible]"
4080 IF X>189 THEN ? #6;"[illegible]"
4100 ? ,"  (press a key)"
4110 FOR I=1 TO 860:NEXT I
4200 POKE 764,255
4210 IF PEEK(764)=200 THEN 4210
4300 RETSUB
5000 REM ----- Instructions -----
5005 GOSUB21:SETCOLOR 2,0,0 POKE 70
0,0
5010 POSITION 0,2:? #6;"BOUNCE!":? ,"
 Atari User"
5020 FOR I=0 TO 5
5040 FOR J=0 TO 15
5050 FOR K=0 TO 6 NEXT K
5060 SETCOLOR 0,I,J
5056 SOUND 0,J#16,10,J/2
5060 NEXT J
5070 NEXT I
5080 SOUND 0,0,0,0:GOSUPRICS 2:SETCOLOR
 2,0,0 POKE 755,0
5090 POSITION 6,6 ? #6;"Bounce!"
5100 POSITION 2,6:? #6;"CAN YOU JUGG T
HE";? #6:? #6,"BALL FOR'S 8000E?#6":?
 #6;" 000000 THE SCREEN!"
```



```
5210 POSITION 1,12 ? #6;"[illegible]
":? #6:? #6," [illegible]" ? #
6:? #6,"   [illegible]"
5215 ? #6 ? #6;"   [illegible]"
5220 ? #6 ?       (press a key to st
art)";
5290 POKE 764,255
5210 IF PEEK(764)=255 THEN 5210
5500 RETURN
7000 REM ----- Initialise ----
7005 A=PEEK(106)-4
7010 POKE 106,A:GOSUPRICS 0
7050 FOR X=0 TO 31
7060 READ A:POKE 1536+X,A
7070 NEXT X
7075 DATA 0,0,0,0,0,0,0,0
7080 DATA 255,129,129,129,129,129,129,
255
7082 DATA 00,128,255,255,255,255,126,6
0
7084 DATA 170,00,170,60,170,66,170,85
7110 DIM A$(1)
7120 A$(1)="":A$(2)=" ":A$(2)=A$
7200 RETURN
8000 REM ------ New ball -----
8010 P=SCREEN((RND(0)#200)+2
8020 IF PEEK(P) THEN 8010
8030 IF PEEK(P-1) AND PEEK(P+1) AND PE
EK(P-28) AND PEEK(P+28) THEN 8020
8050 B=ASC(A$(RND(0)#4))
8060 BALL5=BALL5-1:POKE 204,255
8200 RETURN
9000 REM ----- Screen -----
9020 GOSUPRICS 2:POKE 756,PEEK(106)
9030 SCR=PEEK(560)+256*PEEK(561)
9040 ? #6,"[illegible]";
9050 FOR N=1 TO 22
9060 ? #6;"[illegible]";
9070 NEXT N
9080 ? #6;"[illegible]";
9100 BALL5=25:N=0
9500 RETURN
```



LINE	CHECKSUM	LINE	CHECKSUM	LINE	CHECKSUM
10	1612	20	4500	30	3591
40	1542	50	2317	100	1949
110	1940	170	14060	200	2981
210	1914	300	1680	999	846
1000	5280	1005	4200	1010	14328
1020	12017	1100	12200	4000	4105
4010	9197	4020	4944	4030	3205
4040	8487	4050	8761	4060	9970
4070	8773	4080	9009	4100	4068
4110	3695	4200	3111	4210	6421
4300	1650	5000	8287	5005	8307
5010	9861	5020	7906	5040	2207
5050	1710	5060	2867	5080	3602
5090	1347	5020	5146	5000	5187
5090	6845	5100	17607	5110	10101
5115	8225	5120	8106	5200	2133
5210	8417	5300	1450	7000	5512
7000	2202	7010	4094	7050	2270
7060	1800	7070	1245	7075	1124
7080	6052	7082	5465	7084	5054
7110	1317	7120	4691	7200	1450
8000	4656	8010	4229	8020	1693
8030	11709	8050	1870	8060	4757
8200	1450	9000	4054	9020	8081
9030	4516	9040	3105	9050	3305
9060	3004	9070	1255	9080	1109
9100	2251	9500	1490		



Tired of typing?

Take advantage of our finger-saving offer on Page 60.

Brighten up your graphics displays with this routine from RICHARD PARKES

FLASHER

SOME computers have a Basic command allowing colours to be flashed, but despite the Atari's range of Basic graphics commands it lacks this facility.

The effect could be implemented in Basic by using the SETCOLOR command to change a colour register between two different hues and luminances but this is often awkward.

It would be much easier just to tell the computer which colour register to flash between which two colours and at what speed – and this is what my program does.

The machine code routine uses a vertical blank interrupt (VBI) so once the flash for a particular colour register has been set there is no need to worry about it until the flash is to be turned off.

Listing I is the assembly listing of the routine and for non machine code programmers I've given a Basic demonstration program Listing II.

The machine code data is POKEd into page 6 in line 10 the data being read from lines 20 to 70. The USR call in line 10 sets up the VBI and the variables FLASHON and FLASHOFF are initialised to make calling routines easier. Their values should not be changed during the program.

To get the colour register to flash use:

A=USR(FLASHON,REG, COL1,COL2,SPEED)

where A can be any variable.

REG is the register number. A number 0 to 4 stands for the respective colour registers. A 5 will access location 755 – this can be changed to produce different effects in character graphics modes (a number greater than 5 will be ignored).

COL1 and COL2 are the two colours or values to flash between. The colour value is worked out as the hue*16+luminance, so varying from 0 to 255.

When register 5 is used the following effects in text modes can be produced using one of the parameters as shown (apply to Graphics 0 only except where stated):

0 Inverse text to normal text
1 Inverse text to blanks
2 Normal setting
3 Inverse text to inverse blanks
4 Vertical reflect (all text modes) and inverse text to normal text
5 Vertical reflect (all text modes)
7 Vertical reflect (all text modes) and inverse text to inverse blanks

SPEED alters the frequency of the flash as follows:

0 and 1: Fast flickery effect
2 and 3: Flashes of the same speed
4 to 7: Flashes of the same speed half the speed of 2 and 3
5 to 15: Half the speed of 4 to 7
16 to 31: Half the speed of 8 to 15
32 to 63: Half the speed of 16 to 31
64 to 127: Half the speed of 32 to 63

Different values within the ranges are used so that the flashes can occur at the same rate but out of synchronisation from one another as shown in the example program.

This USR call is used to stop a register from flashing:

A=USR(FLASHOFF,REG,COL)

where A is any variable.

REG is the register number (0 to 5 – a number greater than 5 will be ignored as before) and COL is the value that the register is to retain.

Note that using SETCOLOR or a GRAPHICS command to reset a colour register will not work while the register is being flashed as the flash routine will overwrite the command.

Listing I

```
0000          59          OPT NOBJECT
              0100 ;ASSEMBLER LISTING
              0110 ;OF COLOUR FLASH
0600          0120        *= $600
              0130 ;
              0140 ;SET UP VBI
0600 68       0150        PLA
              0160 ;RESET FLAGS
0601 A900     0170        LDA #0
0603 A205     0180        LDX #5
0605 9D3D06   0190 LOOP1  STA FLAG,X
0608 CA       0200        DEX
0609 10FA     0210        BPL LOOP1
              0220 ;SET REGISTERS FOR VBI
060B A907     0230        LDA #7
060D A206     0240        LDX #6
060F A013     0250        LDY #VBI&$00FF
0611 205CE4   0260        JSR $E45C
0614 60       0270        RTS
              0280 ;
              0290 ;VBI START
0615 EE8306   0300 VBI    INC  TIMER
              0310 ;LOOP TO CHANGE COLOURS
0618 A205     0320        LDX #5
061A BD9D06   0330 MAINLP LDA  FLAG,X
              0340 ;TEST IF FLASH IS SET
061D 1020     0350        BPL  NFLASH
              0360 ;LOOP TO FIND "NO  OF
              0370 ;BITS" OF LENGTH
061F A006     0380        LDY  #6
0621 BD8306   0390        LDA  LENGTH,X
0624 C8       0400 SHFTLP INY
0625 4A       0410        LSR  A
0626 D0FC     0420        BNE  SHFTLP
              0430 ;NOW FIND IF NEED TO
              0440 ;CHANGE COLOUR THIS VBI
0628 8D8306   0450        LDA  LENGTH,X
062B 4D8506   0460        EOR  TIMER
062E 4A       0470 TESTLP LSR  A
062F B01A     0480        BCS  NFLASH
0631 88       0490        DEY
0632 D0FA     0500        BNE  TESTLP
              0510 ;FIND WHICH COLOUR TO
              0520 ;CHANGE TO
0634 4A       0530 CHAFLA LSR  A
0635 B005     0540        BCS  DICOL2
0637 BD9106   0550        LDA  COL1,X
063A D003     0560        BCC  COLSWP
063C BD9206   0570 DICOL2 LDA  COL2,X
063F E005     0580 COLSWP CPX  #5
              0590 ;IF X IS 5 THEN
              0600 ;CHARACTER FLASH
0641 F006     0610        BEQ  CHRFLA
0643 9DC402   0620        STA  708,X
0646 18       0630        CLC
0647 9003     0640        BCC  NFLASH
0649 8DF302   0650 CHRFLA STA  755
064C CA       0660 NFLASH DEX
```

```
0640 18C8   0670        BPL  MAINLP
            0680 ;RETURN FROM VBI
0642 4C62E4 0690        JMP  $E462
            0700 ;
            0710 ;FLASH ON
0645 68     0720        PLA
0646 8A     0730        PLA
0647 68     0740        PLA
            0750  COLOUR REGISTER NO
0648 C980   0760        CMP  #8
            0770 ;FIND IF >=8
            0780 ;IF SO GO TO NOREG1
064A B031   0790        BCS  NOREG1
            0800 ;STORE IN X REGISTER
064C AA     0810        TAX
064D 68     0820        PLA
064E 68     0830        PLA
064F 9D97D0 0840        STA  COL1 X
0652 68     0850        PLA
0653 68     0860        PLA
0654 9D98D0 0870        STA  COL2 X
0657 68     0880        PLA
0658 68     0890        PLA
0659 9DA3D0 0900        STA  LENGTH X
065C A962   0910        LDA  #120
            0920 ;SET FLAG FOR FLASH
065E 9D9DD0 0930        STA  FLAG X
0661 60     0940        RTS
            0950 ;
            0960 ;FLASH OFF
0662 68     0970        PLA
0663 68     0980        PLA
0664 68     0990        PLA
            1000  COLOUR REGISTER NO
0665 C980   1010        CMP  #8
            1020 ;FIND IF >=8
            1030 ;IF SO GO TO NOREG2
0667 B013   1040        BCS  NOREG2
            1050 ;STORE IN X REGISTER
0669 AA     1060        TAX
066A A900   1070        LDA  #0
            1080 ;RESET FLASH FLAG
066C 9D9DD0 1090        STA  FLAG,X
066F 68     1100        PLA
0670 68     1110        PLA
0671 68     1120        PLA
0672 C980   1130        CMP  #8
0674 0013   1140        BEQ  KCHFL
            1150 ;RESET COLOUR REGISTER
0676 9DC402 1160        STA  708,X
0679 60     1170        RTS
            1180 ;RESET CHARACTER REG
067A 9CF302 1190 KCHFL  STA  755
067D 60     1200        RTS
            1210 ;
067E 68     1220 NOREG1 PLA
067F 68     1230        PLA
0680 68     1240        PLA
0681 68     1250        PLA
0682 68     1260 NOREG2 PLA
0683 68     1270        PLA
0684 60     1280        RTS
            1290 ;
            1300 ;DATA
0685 00     1310 COL1   .BYTE 0,0,0,0,0,
0
0692 00
0693 00
0694 00
0695 00
0696 00
0697 00     1320 COL2   BYTE 0,0 0,0,0
0
069E 00
069F 00
06A0 00
06A1 00
06A2 00
06A3 00     1330 FLAG   BYTE 0,0 0 0 0,
0
06AC 00
06AD 00
06AE 00
06AF 00
06B0 00     1340 LENGTH  BYTE 0 0 0,0,0
0
06B4 00
06B5 00
06B6 00
06B7 00
06B8 00
06B9 00     1350 TIMER   BYTE 0
```

Listing II

```
1 REM ****       FLASHER       ****
2 REM **** by Richard Parker ****
5 REM FLASH 2007DOE LINES 30 TO 70
10 FOR J=1536 TO 1709:READ Q:POKE J,Q:
NEXT J:A=USR(1536):FLASH=1616:FLASH1
FF=1647
20 DATA 104,169,6,162,0,157,167,0,230,
18,208,169,7,161,6,100,21,32,98,216,96
,238,167,0,161,0,109
30 DATA 167,0,56,40,160,0,160,153,0,00
0,76,200,202,109,161,0,77,165,0,74,176
,27,138,200,000,74,170,6
40 DATA 189,145,0,144,3,189,181,0,234,
0,240,0,157,170,1,24,144,3,141,243,2,2
00,24,201,70,90,234
50 DATA 104,104,104,201,0,176,69,170,1
04,104,157,146,0,144,104,157,181,0,100
,104,157,104,0,169,126,157,167
60 DATA 0,90,104,104,104,104,6,170,24,
170,169,6,157,167,0,104,104,234,6,240,
0,167,170,2,90,141,212
70 DATA 2,90,104,104,104,104,104,9
6,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0
100 REM DEMONSTRATION PRG FLASH
120 REM
130 GRAPHICS 40
140 POSITION 7,11? #6;"Flash"
150 POSITION 7,2:FOR J=1 TO 5:? #6;C$0
$(104);:NEXT J
160 POSITION 7,11? #6;"   "
165 POSITION 7,13? #6;"     "
170 POSITION 7,15? #6;"   "
180 POSITION 7,8:FOR J=1 TO 9:? #6;C$0
$(130);:NEXT J
185 POSITION 7,7:? #6;"OF"
186 POSITION 7,8:? #6;"      "
170 POSITION 7,9:? #6;"   "
175 C1=121:C2=0
180 A=USR(FLASH00,1,C1,C2,181)
190 A=USR(FLASH00,2,C1,C2,001
000 A=USR(FLASH00,3,C1,C2,24)
210 A=USR(FLASH00,5,C1,C1,001
220 GOSUB 1000
230 IF C1<640 THEN C1=140:C2=C2:A=USR
100
240 POSITION 7,2:? #6;"     "
250 POSITION 7,4:FOR J=1 TO 564:? #6;"
 ";:NEXT J
260 A=USR(FLASHOFF,6,00)
270 A=USR(FLASHOFF,2,0023
280 A=USR(FLASHOFF,7,701
290 POSITION 7,5:? #6;"   "
300 POSITION 7,7:? #6;"DIFFERENT"
310 POSITION 7,9:? #6;"   "
320 A=USR(FLASH00,4,148,00,30)
330 GOSUB 1000
340 A=USR(FLASHOFF,4,0)
350 A=USR(FLASH00,1,002,12,04
000 A=USR(FLASH00,3,70,240,323
370 A=USR(FLASH00,5,48,290,001
100 GOSUB 1000
390 GRAPHICS 0:POKE 752,1
400 POSITION 5,0:? "
                    ";
410 T=5:GOSUB 2000
420 POSITION 5,7:? "
                    ";
330 GOSUB 2000
440 POSITION 5,9:? "
                    ";
000 POSITION 5,331? ";"
                    ";
000 GOSUB 2000
000 POSITION 5,331? "
                    ";
470 GOSUB 2000
000 POSITION 5,331? ";"
                    ";
490 GOSUB 2000
000 POSITION 5,351? "
                    ";
510 GOSUB 2000
520 POSITION 5,17:? "
                    ";:POSITION 00,13
RZM A=USR(FLASH00,0,2,4,043)
540 GOSUB 1000
550 A=USR(FLASHOFF,6,601
500 A=USR(FLASHOFF,1,2022
570 A=USR(FLASHOFF,1,640)
580 A=USR(FLASHOFF,3,701
590 A=USR(FLASH000,5,3,0,223
000 GOSUB 1000
610 A=USR(FLASH000,5,1,0,01
020 GOSUB 1000
030 A=USR(FLASH000,5,6,2,101
640 GOSUB 1000
600 A=USR(FLASHOFF,5,23
600 GOTO 130
1000 FOR J=1 TO 1000:NEXT J:A=1000
2000 POSITION 5,7:? "
                    ";:?:??:??TURN
```



1	4479	2	6919	5	6001
15	14929	00	10000	30	14748
60	13974	00	10041	00	14318
78	12484	100	9000	126	671
126	5151	116	8130	116	8000
146	5701	100	8100	150	8401
160	6050	150	8711	165	4007
170	6157	170	7722	000	4067
190	3441	230	6652	215	4670
220	1228	230	6402	260	0007
230	0139	290	5900	270	3043
290	1974	230	5199	300	0093
210	0007	300	4710	336	1925
260	3072	000	0015	000	4692
270	4071	000	1925	430	1000
000	1000	416	2200	400	9244
435	1928	400	13725	000	1928
000	3002	470	1925	400	11072
450	1928	000	7400	010	1928
500	22001	510	9230	000	1928
000	3706	000	4041	570	0008
500	2974	590	4267	000	1928
610	0000	615	1925	000	4278
000	1928	000	0002	000	1810
1000	6870	2000	9774		



Tired of typing?

Take advantage of our finger-saving offer on Page 80

GET IN THE PICTURE

MIKE ROWE shows how you can load and view pictures tucked away in commercial discs in non-DOS format

PROGRAM MAP

100-150	Get command
300-320	Format a disc
400-470	Get directory
500-530	Load DOS format or cassette file
600-630	Save DOS format or cassette file
700-710	Load block of disc sectors
800-810	Save block of disc sectors
900-940	Full screen routine
900	Change to full screen display list
920	Wait until a key is pressed
930	Cancel pressed key and switch back to split screen display list
940	Back to get loop
1000-1230	Read in machine code
1000-1030	Read in Sector load/save routine
1040-1140	Sector load/save machine code data
1200	Read in file load/save routine
1210-1220	File load/save machine code data
2000-2020	Sub-routine to print command lines
2200	Load File
2300	Save File
2400	Save Disc sectors
2500	Load Disc sectors
3000-3200	Initialise display lists
3000	Start with graphics mode 8+16
3010	Use a string DL$ for second display list. Find address of start of DL$
3020	Switch off display to speed up
3030	Find start of original display list
3040-3100	Change original display list from Graphics 8 to 15. This allows the program to run on the 400/600 which do not support graphics Mode 15 normally
3110	Find start of screen memory (same for both display lists)
3120	Copy original display list to DL$
3130	Make two changes to DL$ to tell display list where it starts
3140	Having created first display list restart with graphics 8 to get text window
3145-3150	Convert to graphics 15
5000	Error handling routine

THIS Micropainter transfer program enables you to manipulate Micropainter or other standard 62 sector graphics files.

Program I will allow you to transfer Micropainter files between DOS files, cassette files, and disc sectors.

Many commercial discs contain Micropainter-style files in non-DOS format, but saved as continuous sectors. This program will enable you to load and view these pictures.

When you first run Program I the screen will go black for about 30 seconds. It will then display a blank screen with instruction lines below. You can now load a picture by pressing 1 or 3 and Return.

If you press 1 you will be asked for a filename. If you want to load a DOS file enter D:filename or enter C: for a cassette file.

If you press 3 you will be asked for the start sector. This will tell the program which disc sector to start loading from.

The last option is the one to use to load from a commercial disc. To do this when you are asked for the sector number initially enter 1.

If no recognisable part of a picture is seen next time enter 100, then 200 and so on up to 600.

If no portion of a picture is seen then there is no standard picture on the disc. If a picture is found you usually only have part of it, so keep changing the sector number until you find the correct sector to load the picture fully.

Many commercial discs contain

protection and part of the disc may be unreadable. If this is the case the program will restart and you can enter a different sector.

When you have a picture loaded you can press Return to toggle between a partial picture and the full one.

Saving a picture is just as easy. Pressing 2 will save the picture as a file. Again you will be asked for a filename.

To save to disc enter D:filename to save to cassette enter C. If you want to save a picture directly to disc as a non-DOS file press 4 and enter the start sector as requested.

However beware this option can write over any other information on a disc and erase it so use it carefully.

There are two other disc commands. D which will produce a disc directory. To pause the rather rapid display of this press Ctrl-1 and press it again to resume printing.

The final command is F which after confirming the request will format the disc. Note that this will also erase the disc in your drive!

The program is not designed to handle the colours of the picture properly and will display only the default colours. This is because pictures saved as sectors or on tape have often lost their colour data and it is primarily these that the program is designed to deal with.

Also the program is only intended to work in single density format and may not work with double density.

MAIN VARIABLES

A$	Used to get command input and also file names
DL$	String used to hold second (full screen) display list
DL	Start of full screen display list
DLL	Low byte of this
DLH	High byte of this
DLIST	Start of split screen display list.
DLIL	Low byte of this
DLIH	High byte of this
START	Sector to start from
BUF	Address of screen memory
NO	Number of sectors to load

Program II is a short Basic program to set up and load a micropainter file. The screen takes a while to set up as the 400/800 machines do not support the correct graphics mode from Basic.

Again the program when run will ask for a filename. These can be D:filename or disc or C: for cassette. It will then load and display the picture.

DATASCAPE
ATARI SOFTWARE SPECIALISTS

£££££ Special discount prices

UTILITIES

Megafont II+	24.95
Page Designer	24.95
Rubber Stamp	32.95
Typesetter	32.95
Graphics Art Dept	29.95
Arcade Conn. Set	29.95
Print Shop	37.95
Blank 5¼ M/Wiper	44.95
Super Script	59.95
Homeword	39.95
U.S. Doubler	69.95
Rambo XL	49.95
Real Time Clock	79.95
P.R. Connection	29.95

CARTRIDGES

Robotron	12.95
Mr Pacman	12.95
Pacman	9.95
Centipede	9.95
BC's Quest	9.95
Q-bert	9.95
Bounty Bob	39.95
Miner 2049er	7.95

ALL LEVEL 9 AND INFOCOM TITLES IN STOCK CALL NOW NEW LOW PRICES

ALL US GOLD, ACTIVISION, ARIOLASOFT, ENGLISH SOFTWARE AVAILABLE

ADVENTURES

	Cass	Disk
Mask of the Sun	N/A	37.95
Serpents Star	N/A	37.95
Wizard/Princess	N/A	14.95
Dark Crystal	N/A	19.95
Ultima I	N/A	14.95
Ultima II	N/A	21.95
Ulysses	N/A	19.95
Mission Asteroid	N/A	14.95
Suspended	N/A	26.95
Planetfall	N/A	19.95
Zork I	N/A	19.95
Seastalker	N/A	19.95
Hitchikers Guide	N/A	24.95
Worms Paradise	9.95	N/A
Eidelon		23.95
Koronis Rift		23.95
Mercenary	9.50	10.50
Rescue on Fractalus	9.50	12.55
Hacker	9.50	12.55
Gr. Amer. Road Race	9.50	12.55
Bell Blazer	9.50	12.55
Ghostbuster	N/A	12.55
Decathelon	9.50	12.55
Pitfall II	9.50	N/A
Music C. Set	N/A	12.55
Smash Hits IV	12.95	16.45
Boulderdash	7.75	12.55
Electra Glide	7.95	11.45
Encounter	9.50	9.95
Oils Well	Disk	12.95
Mr Robot	Disk	12.95
Spy II	9.95	14.95
Fighter Pilot	9.95	12.95
Zone X	9.95	—
King of the Ring	9.95	12.95
Jump Jet	9.95	11.95
Bruce Lee	13.95	13.95
Zorro	8.95	13.95
Spy Hunter	8.95	13.95
Goonies	8.95	—
Kennedy Approach	13.45	13.95

ATARI 520ST

Ultima II	54.95

ALL INFOCOM + MANY MORE ST TITLES NOW IN STOCK

FLIGHT SIMULATOR II ONLY £38.95

SSI

USAAF	47.95
Kampfgruppe	48.95
OP. Market Garden	44.95
Questron	44.95
Carrier Force	47.95
Break/Th Ardennes	47.95
Gemstone Warrior	32.95
Computer O/Back	32.95
Objective Kursk	32.95
Panzer Grenadier	33.95
Battalion Commander	33.95
Field of Fire	27.95
Imperium Galactum	27.95
Ra is West	29.95
Six Gun Shootout	32.95

Send cheque or postal order to:
DATASCAPE
9 WREN WOOD, TANS HANGER, WELWYN GARDEN CITY, HERTS AL7 QF. TEL: 0707 334081.

SOFTWARE FOR THE ATARI ST

METACOMCO PRESENTS ITS NEW RANGE OF SOFTWARE FOR THE ATARI ST A SET OF POWERFUL PROGRAMMING LANGUAGES FOR PEOPLE WHO WANT TO WRITE PROGRAMS FOR THE ST.

MACRO ASSEMBLER

£49.95

A high specification macro assembler, complete with linker and screen editor Assembler is a fundamental language, useful for all kinds of programming - particularly where speed and compactness are important Essential for all serious programmers who want to exploit the ST's full potential

MCC PASCAL

£89.95

A powerful Pascal compiler designed to meet the exacting ISO standard. This Pascal is already widely used on the Sinclair QL and the Commodore Amiga. A fast, single pass compiler, generating native code. Full interface with GEMDOS libraries allows windows, icons, menus, etc to be programmed using Pascal. Complete with screen editor and an extensive user manual.

LATTICE C

£99.95

The well known Lattice C compiler a full Kernighan and Ritchie implementation with comprehensive libraries of UNIX and utility functions and including a complete interface to GEMDOS features. C is the ideal language for program development.

ALL METACOMCO'S LANGUAGES FOR THE ATARI ST INCLUDE METACOMCO'S POPULAR SCREEN EDITOR, AND A DETAILED MANUAL.

Metacomco are leading suppliers of systems software for 68000 based microcomputers As well as these titles for the Atari ST, Metacomco have a very successful range of programming languages for the Sinclair QL now widely used throughout the world. Metacomco was also chosen by Commodore to provide the operating system and a suite of languages for the new Amiga computer

METACOMCO

26 PORTLAND SQUARE, BRISTOL BS2 8RZ, UK
TELEPHONE BRISTOL (0272) 428781
In the USA call 1 800 252-6382

Lattice is a trademark of LATTICE INC. GEMDOS is a trademark of DIGITAL RESEARCH INC. UNIX is a trademark of AT+T Bell Laboratories. Prices include VAT and P&P UK mainland only. Delivery allow up to 28 days

PHONE TODAY OR POST THIS COUPON TO METACOMCO 26 PORTLAND SQUARE, BRISTOL BS2 8RZ

PLEASE SEND ME

MACRO ASSEMBLER FOR THE ATARI ST	£49 95	☐
MCC PASCAL FOR THE ATARI ST	£89 95	☐
LATTICE C FOR THE ATARI ST	£99 95	☐
MORE INFORMATION		☐

I ENCLOSE A CHEQUE FOR £ _____ OR DEBIT MY ACCESS/VISA NO ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD EXPIRY DATE _____

NAME _____

ADDRESS _____

SIGNATURE _____ POSTCODE _____ TEL. NO. _____

AU4

Program I

```
0 REM MICROPAINTER TRANSFER PROGRAM
1 REM By Mike Dunn
5 GOSUB 805:DIM F$(20),A$(40),B$(1
0 GOSUB 1000:GOSUB 5000
90 REM MAIN MENU
95 POKE 559,34
100 GOSUB 2000:INPUT A$
110 IF A$="1" THEN 800
120 IF A$="2" THEN 900
130 IF A$="3" THEN 200
140 IF A$="4" THEN 800
150 IF A$="5" THEN 800
160 IF A$="Y" THEN 800
170 GOTO 100
200 ? "[redacted]": 800 200 SURE";
:INPUT A$:IF A$()"Y" THEN 100
210 XIO 254,00,0,0,"D:"
220 GOTO 100
800 OPEN 00,6,0,"D:M.M"
440 TRAP 000
000 INPUT 00,A$:? A$;"  ":INPUT 00,A$
:? A$:GOTO 470
900 CLOSE 00:INPUT A$
670 TRAP 5000:GOTO 200
000 ? "Y":? "ENTER MICROPAINTER FILENA
ME TO SAVE":INPUT A$
810 CLOSE 03:OPEN 03,4,0,A$
820 GOSUB 2200:CLOSE 03
830 GOTO 100
000 ? "Y":? "ENTER MICROPAINTER FILENA
ME TO SAVE":INPUT A$
820 CLOSE 00:OPEN 0E,8,0,A$
600 GOSUB 2100:CLOSE 00
830 GOTO 100
700 ? "ENTER SECTOR # TO READ FROM":20
P07 A$:STOT=VAL(A$)
710 GOSUB 2000:IN70 100
000 ? "ENTER SECTOR # TO SAVE TO":INPU
T A$:START=VAL(A$)
810 GOSUB 2000:GOTO 100
000 PRIE 000,DLL:POKE 009,0LS
910 POKE 350,000
000 IF PEEK(764)=3N THEN 930
000 POKE 753,000:POKE 000,0LIE:POKE 60
1,0L10
000 GOTO 100
0400 FOR I=0400 TO 1507
1020 0C00 Y:POKE 0,Y:ADED Y
1040 0070 I2,60,216,104,201,6,000,74
1000 0070 104,104,141,1,I,100,104,141
1090 0070 I,I,104,141,I3,I,104,141
1070 0070 10,I,104,133,204,104,133,204
```

```
1000 0070 104,141,0,I,104,141,4,I
1000 0070 23,00,000,00,20,173,4,I
1100 0070 26,I30,120,I01,4,I,I70,0
1110 0070 I,100,0,141,6,I,220,I0
1I90 0070 I,100,I,I20,I3,I,I90,I02
1I30 0070 I00,I32,190,000,I0,I10,190,I
1I40 0070 I32,I10,00,I65,0,141,I3,00
1200 700 R=1800 TO 1909:READ Y:POKE R,
Y:NEXT R
I210 0070 I80,104,100,141,9,6,I62,I0,1
65,7,157,00,I,I65,00,157,00,I,I05,09,1
07,65,I,I65,R
I0XX 0070 157,70,I,I09,II,I07,70,I,00,
00,I30,I07,I0,157,00,I,II,00,I20,90,0,
0,0,0,0,0,0,0,0
1230 0C1000
2000 ? "Y":? "[redacted] - 1000 FILE    [redacted] - 900
0 FILE"
2010 ? "[redacted] - 1000 SECTORS [redacted] - 5000 5057
009"
```




```
 0  7190    1  I727    0  2671
 10 2000   20  1852   30  1974
100  3766  110  I622  I20  3027
I30  3035  I40  3041  I6E  3077
I05  I202  I60  I014  I00 I6060
I10  I907  I70  I600  000  I1B0
I10  I696  I20  0079  I05  I3E2
I70  3456  000 I6902  I15  2020
020  I654  010  I600  000 I1007
I10  I901  020  0020  I20  I000
700 I0025  710  I725  000  5927
010  I751  000  I703  310  21B7
I00  I200  I20  I003  30E  I000
1000 I0I95 1000 I500 I060 I00I
1000 I090 I00I I0I1 I070 I1I1
1000 I600 I090 I037 I100 I060
1110 I100 I170 I067 I130 I144
1150 I060 I200 I210 I210 I235
122E I2716 I270 I630 2000 7I00
7015 7025 I02E I630 I200 I500
2100 I504 I600 I21E I000 7113
I000 I101 I010 I0001 7015 I007
I00E 5723 I000 I007 I070 I1D6
I005 I077 I050 I50E I100 I245
I21B I000 I120 I070 I130 7611
I105 I057 I16E I705 I100 I007
I100 I7D0 I170 I677 I100 I50E
I150 I16E I190 I042 I200 I600
I000 0I50
```

```
1000 0CT000
2300 0=USR(16030,7):0CT000 :REM L000
2300 0=USR(16030,213):0CT000 :REM 500C
2000 0=USR(15000,2,07,STOT,00,00F3):0CT
000
2000 0=USR(15000,1,01,STOT,00,20F3:0CT
000
3000 GRAPHICS 24:POKE 009,0
3010 DIM 0L$(2001):DL=ADR(0L$):0LN=INT(
000(0L$)/2001:DLL=DL-0LN*200
3000 POKE 009,0
3030 0L1E=PEEK(004):0L1L=PEEK(005):0L1
ST=0L1N*256+0L1L
3040 POKE 0L1ST+1,70
3050 FOR I=0L1ST+0 TO 0L1ST+250
```

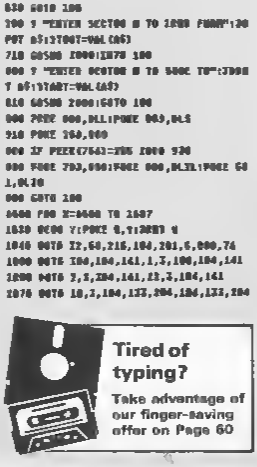
```
3000 IF PEEK(I)=10 THEN POKE I,14
3070 IF PEEK(I)=79 POKE POKE I,70
3100 NEXT I
3110 POKE=PEEK(006)+256*PEEK(09):I00=61
3120 FOR I=1 TO 201:0L$(I)=CHR$(PEEK(4
L1ST+I-1)):NEXT I
3130 0L$(201,201)=CHR$(0LN):0L$(200,70
2)=CHR$(0LL)
3140 GRAPHICS 0:POKE 009,0
3145 0L1E=PEEK(15A1):0L1L=PEEK(0000):0L1
ST=0L1N*256+0L1L
3100 POKE 0L1ST+3,70
3100 FOR I=0L1ST+0 TO 0L1ST+150
3170 IF PEEK(I)=10 THEN POKE I,14
3100 IF PEEK(I)=73 THEX POKE I,70
3190 NEXT I
3190 0L=ADR(0L$):0LH=INT(000(0L$)/2001
:0LL=0L-0LH*000
3200 0CT000
3000 ? "Y":? "ERROR - ";PEEK(195):3E00
T 00:GOTO 100
```

Program II

```
0 REM GRAPHICS FILE LOADER
1 REM By Mike Dunn
20 GRAPHICS 0:DIM F$(20)
20 ? :? :? "Enter Picture File":? "0.0
, 0:D0STORE OR 0:"
30 INPUT F$
00 IF F$(1,01()"0:" 000 F$(1,01()"0:"
THEN 000
100 GRAPHICS 24:POKE 009,0
110 FOR 0=15A0 TO 1005:READ Y:POKE 0,Y
:NEXT 0
120 0070 I04,I04,I06,I41,9,6,I02,I0,I0
9,7,I57,00,I,I20,00,I07,00,I,I05,01,I0
7,05,I,I05,0
130 0070 I07,70,I,I09,II,I07,73,I,20,0
0,I30,I07,I0,I07,00,I,II,00,I20,90,0,0
,0,0,0,0,0,0,0
140 0L1ST=PEEK(004)+PEEK(005)*256
100 POKE 0L1ST+I,T0
150 FOR I=0L1ST+0 TO 0L1ST+100
170 IF PEEK(I)=10 THEN POKE I,14
100 IF PEEK(I)=79 THEN POKE I,70
190 NEXT I:POKE 009,14
200 CLOSE 00:OPEN 00,4,0,F$
210 0=USR(15E06,7)
220 CLOSE 00
200 GOTO 100
```




```
 0  4703    1  I717    10  3966
 00 I1416   I0  I859    00  7429
100  4105  II0  7610   I00 I3924
I20 I9116  I40  0400   I00  2307
I00  4I0E  I70  4077   I00  4945
I50  3729  000  I900   210  3379
220  I559  300  I612
```

NEW!!! LOW COST SHORT TERM FINANCE NOW AVAILABLE

Mega Deals

Best Price for
ATARI HARDWARE
in the U K

ATARI ATARI

Atari 130XE Computer £119· 95 +£5 p&p

Atari 1050 Disk Drive (with FREE Home File Manager, Payoff Adventure, Demo Disks & 10 FREE Blank Disks) £129· 95 +£5 p&p

Atari 1027 Letter Quality Printer (with FREE Atari Writer) £145· 90 +£5 p&p

Atari 130 XE, 1050 Disk Drive & 1027 Letter Quality Printer (with FREE Home File Manager, Payoff Adventure, Demo Disks, Atari Writer & 10 Blank Disks) £350· 95 +£5 p&p

Goods despatched SAME DAY — Faulty ITEM 12 Month Warranty ANY PRODUCT FOUND TO BE DEFECTIVE WITHIN 10 MONTHS OF PURCHASE WILL BE REPLACED FREE OF CHARGE

CONTACT US NOW FOR THE LATEST PRICES + AVAILABILITY OF ALL ATARI PRODUCTS

Best Prices for
BLANK DISKS
in the U K
Top Quality 5¼" Bulk Packed Disks
(Hub-Ringed and in White Envelopes with a Lifetime Warranty)

FREE!!! Plastic Library Case worth £2 when you buy 10 Disks

FREE!!! Perspex Disk Storage Box worth £10 when you buy 50 Disks

10 — 5¼" Single Sided/Double Density Blank Disks (with FREE case) £9· 95 +£1 p&p

10 — 5¼" Double Sided/Double Density Blank Disks (with FREE case) £13· 95 +£1 p&p

50 — 5¼" Single Sided/Double Density Blank Disks (with FREE Storage Box) £49· 95 +£2 p&p

50 — 5¼" Double Sided/Double Density Blank Disks (with FREE Storage Box) £69· 95 +£2 p&p

WITHIN DESPATCH! Same day 1st Class Post WITHIN BACK GUARANTEE If you are not PLEASED satisfied with your purchase you will either exchange your item or get a FULL REFUND — that's the responsible Guarantee.

Please send cheques/postal orders to
Compumart (Dept AU)
71 Gracedieu Road, Loughborough
Leics. LE11 0QE

Compumart Corner
CREDIT CARD LINE — HOTLINE — 0509 262259 — NOT





BRATACCAS
THE INTERACTIVE VIDEO — AVAILABLE NOW

Brataccas engineered like no other software already described as the product that broke the mould it is the ultimate software experience Take the challenge, become Kyne the earth scientist accused of the hideous crime of genetic fraud flee to the outskirts of the solar system struggle to survive in the hostile environment, above all prove your innocence

Brataccas an innovation an incredible concept other products pale into insignificance.

BE PART OF THE BRATACCAS EXPERIENCE

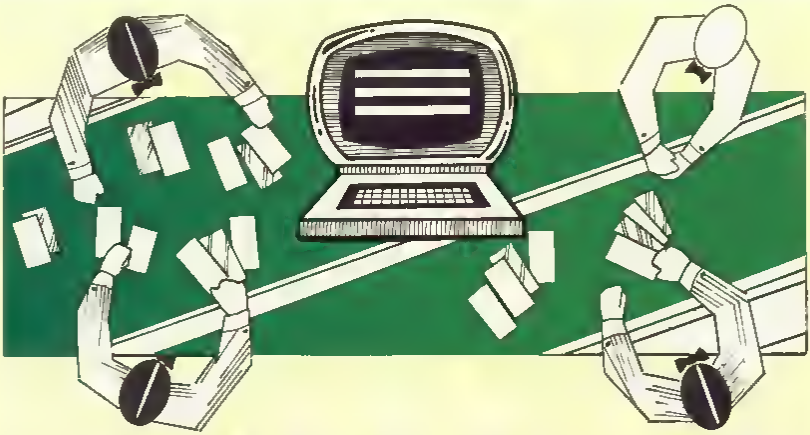
Brataccas - designed for the 520ST 512k Amiga and 512k Macintosh compatible with colour and black & white monitors

Original poster by Roger Dean included

Available now for £34 95 inc. VAT and p&p. Allow 7 days for delivery Europe add £1 50 for postage

Post coupon now to Psygnosis Ltd. 1st Floor Port of Liverpool Buildings Pier Head Liverpool L3 1BY
Please rush me copies of Brataccas for my
☐ Atari 520ST ☐ Commodore Amiga ☐ Apple 512 MAC
Please debit my Access/Barclaycard (delete as necessary)
Card Number
I enclose Cheque/PO for £
Name
Address
AU2

SUPERFAST CREDIT CARD SALES LINE
051-227 4800
VISA



BRIDGE

By JOHN HOOPER

THIS program allows you to bid and play contract-bridge against the computer. The standard of play is quite sophisticated so it uses storage-saving techniques to permit the program to run in 16k.

Select the card you wish to play with the joystick. Bidding is done by typing the particular bid you wish to make when it is your turn.

The game is in two parts – bidding and card-play. The computer randomly deals four hands. You play South and the computer bids and plays the other hands.

Bidding

The game follows the Nottingham club bidding convention which is described later. Bids are displayed at the top of the screen. Enter them by typing the bid followed by Return. When it is your turn you are prompted with 'BID ?'. The bid format is a number followed by the letter to indicate the suit.

For example, 1H for one heart, 3NT for three no-trumps, P for pass and D for double. The computer will not accept bids in the wrong format and will prompt you again with 'BID ?'.

When bidding is finished the computer asks you to type the identity of declarer, which is 1 for North, 2 for East, 3 for South or 4 for West.

You are then asked to type the contract say 2NT or 3H and so on. This allows you to play a hand that would otherwise be played by the computer or permits you to set a more challenging contract. You will find this useful.

Card-play

Plug the joystick into port 1. The contract is displayed at the top left of the screen.

The first card is played by the hand to the left of the declarer. 'Dummy's' hand is then displayed. When you are required to play a card you will be prompted with a '?' and the cursor will be displayed.

Using the joystick place the cursor over the card you wish to play and press the Fire button. The card will be played and deleted from your hand. At the end of the trick the screen displays the winner and the trick total for each hand. To begin the next trick press the Fire button.

Pressing the Fire button after trick 13 instigates a redeal and the bidding for the next game begins.

Pressing the Esc key at any point in the card play also instigates a redeal as soon as the next card is played.

- The display follows the normal format to be found in books, except that 'T' represents Ten.
- Each hand is separate and should be bid to the highest contract feasible for that hand.
- There is no vulnerability.
- Each deal is random and yields interesting distributions.

Playing hints

The computer plays either to achieve the contract if it is declarer or to defeat the contract if it is defence. It is not so concerned to get the maximum number of tricks.

It is capable of developing various long-term strategies – it can duck tricks, cross-trump, finesse, develop long suits and so on.

If you (South) are in defence for example the computer as your partner (North) will join with you in a sensible strategy just as a human partner may do.

But the computer will not recognise the convention 'lead the fourth highest of longest suit'. In no trump contracts. Also if you hold KQ or QJ etc and you are in defence lead the higher of the pair or the computer will

assume that the opposition holds the higher card

Bidding convention

Points are counted as ACE (4) KING (3) QUEEN (2) and JACK (1) This is a simple convention to use without many of the more complex – and to my mind obtuse – ingredients which impoverish the less than brilliant player's game I have set limits for the computer which make it competitive and seemingly able to take risks

Opening bids. The following are permissible

1C (one club)	16-20 points Partner is required to respond
1D 1H, 1S	12-15 points with a five-card suit in the bid suit
1NT	12-15 points, but with no five-card suit
2C	12-16 points with clubs as the five-card suit
2D 2H 2S	20+ points with a five-card suit in the bid suit.
2NT	20+ points without a five-card suit. Partner should respond
3C, 3D 3H 3S	Pre-empt Between 8-11 points with at least seven cards in the bid suit

Note that any other opening bid will not be understood by the computer I would not like to predict its response

Responses. The following describes the normal responding bids to the above

After 1C

- Less than 7 points – Respond 1D
- Between 7-11 points – 1NT or 1 something In a good suit
- Between 12-15 points – Jump response to 2 something If you have a five-card suit the something should be that suit otherwise NT
- More than 15 points – Jump to 3 something'
- After 1D 1H, 1S 1NT 2C

Responses are natural here that is more or less what you would expect The responding bid lets partner know your points and distribution So if you have a poor hand, but with some support for partner's suit then rebid his suit at the next level for example 1D-2D

If you have a good hand, perhaps an opening bid in your own right then jump respond showing your points as well as your strong suit (For example 1D-2S – jumping past 1S) You have to use your sense here because there are many variations

Another example Suppose the opening bid was 1NT You have a poor hand but a five-card suit So respond with 2 in that suit – say 1NT-2S

Your partner will probably not bid further because this is assumed to be a limiting-bid

If you have a very strong hand then jump to the level you think best describes that – but if you bid too high you may not leave room for slam bidding

After 2D 2H 2S 2NT

If partner has bid this, he has a very strong hand The chances are that you will have a weak hand but of course you must respond

If you have a poor hand merely support your partner by bidding the next bid up say 2D-2H

If you hold 6 points or more bid your best suit at a higher level such as 2D 3H Other variations are possible

After 3C 3D 3H 3S pre-empts

The computer has quite a complex function to respond to your pre-empt but how do you respond to it? In general a pre-empt means not many points but one strong suit

Therefore you are wise not to change suits unless your hand is exceptionally strong in another suit Another consideration is that if you hold 11 points or less the opposition will probably hold the majority of the points

You are probably best to bid P (pass) in that case Otherwise bid higher in your partner's suit say 3D 4D

Bidding to slam. This can be tricky (pardon the pun) If you wish to bid to slam (6 or 6 something) signal this by bidding 4C The computer will probably assume you are asking for aces and will respond

4D 0 aces
4H-1 ace
4S-2 aces
4NT-3 aces
5C-4 aces

You should next ask for kings Do this by bidding the next available bid For example if the computer has responded 4S you return 4NT The computer will tell you how many kings it has by bidding like this

- Next available bid –0 kings
- Next available bid+1 – 1 king
- Next available bid+2 –2 kings

and so on

For example if you had asked for kings by bidding 4NT (as above) the computer will bid 5H if it holds 2 kings

Armed with knowledge of top cards you can then make your final bid

The problem comes when the computer bids 4C Does this mean it



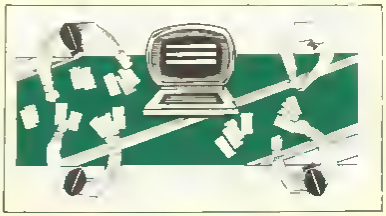
is asking you for aces? You have to infer this from the pattern of the previous bidding

Bidding after opening-bid and response The object is to bid the best possible suit or NT if a good fit cannot be found at the highest level that you think the cards can be played

Generally after opening-bid and response you should have a good idea of point counts and distribution and you should bid naturally for best effect

Interference and competitive bidding The same rules apply as before except that you may not be in a position to give a clear unambiguous description of your hand

Doubling The computer thinks of double as an indication of strength It will not double for penalty points



PROGRAM DESCRIPTION

5-17	Define variables arrays
20-500	Random deal into array C(4 13) i e 4 hands whh 13 cards
900-1080	Subroutines for screen displays Note the symbols for the suits Also on the first run through CON=0 therefore only South s hand is displayed After CON has been set to 1 other hands can be displayed
2000-2310	Subroutine to evaluate hand strength Each card is read in line 2010 and suit lengths (SU) and points (P) are calculated
2500-2820	Subroutines for bidding display plus analysis of South s bid B$ Each time a bid is made a value is assigned to BD(n) and n is incremented For example if the opening bid is Pass BD(1) is set to 50 and n increases to 2
3000-4650	Main bidding control Variable Y is used to monitor the state of the bidding so as to pass control to the rest of the program when bidding has finished Z is either 1 or 2 with 1 being assigned to North and South and 2 to East-West This allows the total strength of either partnership to be estimated and maximum values to be given to limit the bidding -MAX(Z) This effectively determines the contract
6000-7030	Responding bid control The value previously given to BD(n) is now seen to be of use BD(n 2) is the strength of your partner s last bid BD(n 1) is the strength of the opponent s intervening bid
5000-5130	Card play control This uses some of the variables used in the bidding to save storage This section monitors the play deciding whose turn it is what cards are permissible which suit is trumps who has won the trick and so on
5900-5980	Crude subroutines to select either the highest or lowest card
8000-8160	Joystick routine 8105 gets the card The suit is given by the value of Q which is dependent on the cursor row position
8300-8590	Display routines for card-play
7500-7980 and 8600-9995	Play routines These decide which card should be played and which strategy should be adopted At each trick the program looks at how many tricks are needed to achieve or defeat the contract If there is a simple strategy it will use it If not the strategy will depend on whether or not the contract is in no-trumps or how many trumps are outstanding or how many tricks are left to play and so on

```
1 REM ********************
2 REM BWM      BRIDGE      BWM
3 REM BWM by John Hooper BWM
4 REM ********************
6 OPEN #6,17,0,"S:":POKE 710,150 POKE
752,1
10 GR=0:K1=1:E$="K1*K1:K2=K2+K1:K6=K1*K
1:E6=K4*K1:E6=K5*K1:E7=E6+K1:K8=E7+K1
K10=22*K8 K11=K10+K1:K12=K11*K1
11 K13=K12*K1:K14=K13*K1*K10:K2*K14:K2
6=K8*K4:K26=K10*K1:K46=K4*K10:K68=K8*K
10
14 DIM C$(53),C(K4,K13),N$(K5),S0(K4)
,PC(5),B$(K5),BID(K4),BD(255),MAX(K4),S
Y(K2),BL(K2),TOP$(K4,K2),T0PL(K2)
15 C1=0:C$="K0:C2=K0:C3=C4=K0:L=K1 FOR S=
K1 TO K4:BD(S)=K0*BD=K0 S=K1 ONID=K0
16 C$="234567891JQKA234567891JQKA23456
789TJQKA23456789TJQKA":L$=L$+L$:L2=K2*
8:L3=4*8:L4=4*6:L7=7*8
17 POKE(K1)=K2*K7:POKE(K1)-K6*K7:BL(K1)=
K0:BL(K2)=K0:S1(K1)=K0:S1(K2)=K0:CON=K
0
20 FOR X=K0*K2 TO K1 STEP -K1:X=INT(R
ND(1)*K4*K13):D0 E GOTO K5*K2,K3*K4,K
5*K6,K6*K5
100 IF C1=K13 THEN 200
150 C1=C1+K1:C(K1,C1)=X:GOTO K5*K10
200 IF C2=K13 THEN 300
220 C2=C2+K1:C(K2,C2)=X:GOTO K5*K10
300 IF C3=K13 THEN 400
320 C3=C3+K1:C(K3,C3)=X:GOTO K5*K10
400 IF C4=K13 THEN 100
420 C4=C4+K1:C(K4,C4)=X
900 GOXY X
905 A=K20:B=K20-K1:B=B1:POSITION A,B:?
 "S":GOSUB 1000:IF CON=K1 THEN RETURN
910 GOTO 1000
920 A=K20:B=K2(N=K1:POSITION A,B:? "W"
:GOSUB 1000 RETURN
930 A=K30.B=B1:N=K1 POSITION A,B:? "E"
 GOSUB 1000:RETURN
970 A=K10*B=K6:N=K4 POSITION A,B:? "N"
:GOSUB 1000 RETURN
1000 POSITION A-K4,B+K1:? C0$(K13*N,N
=K4
1010 FOR X=K1 TO K13:IF INT(C(N,X)-K1
)/K13)+K1=Z THEN ? C$(C(N,X),C(N,X));
1020 NEXT X
1025 ON K GOTO 1050,1060,1040,1030
1030 POSITION A-K4,B+K3:? C0$(K6);:E=
K1:GOTO 1010
1040 POSITION A-K4,B+K3:? CH$(K6);:E=
K2:GOTO 1010
1050 POSITION A-K4,B+K0:? C0$(K10,K1
=K1:GOTO 1010
1060 RETURN
2000 IF CON=K0 OR CON=T(K1 THEN COUNT
=K0:P=K0:FOR S=K1 TO K4:S0(S)=K0:P(S)=
K0*NEXT S
2010 FOR X=K1 TO K13:E=INT((C(N,X)-K1
)/K13)+K1:SU(E)=SU(E)+K1:IF C(N,X)>K10
-K4 THEN P(E)=P(K1)+C(0,X):IF (X)JAN K4)
2020 NEXT X:IF CON=K1 THEN COUNT=COUNT
+K1 RETURN
2030 P=P(K1)+P(K2)+P(K3)+P(K4)
2250 S=K4:FOR T=K1 TO K4 STEP -K1
```

```
2260 IF S0(S))=5H(T) THEN 2280
2270 S=S-KI:GOTO 2200
2280 RETURN
2290 SU(K0)=S:IF SH(50+K0))24 THEN SU
=56(K0):GOTO 2310
2300 S0=K5
2310 RETURN
2500 POSITT00 K2,K0+Y "M","C","S","M"
K=INT(RND(0)*8+4):IF K<>3 THEN 200
0
2530 TRAP 2550:POSITT00 K10,K10:? "K10
";:INPUT B$ POSITT00 K16,K10:? "
  ";:IF B$(K1 OR B)K0 THEN 2535
2532 IF BT0(K1)=KI THEN 00X(K1)=P:GOTO
 2535
2532 00X(K1)=M:N=K1:GOSUB 5000
2534 00X(K1)=BAR(K1):PP 65:N=K1
2540 IF B$(K1,K1)="P" THEN 00(N)=KS0 G
OTO L3
2560 IF B0(K1,K1)="0" THEN BB(N)=X40:G
OTO L3
2590 BB(N)=EVOL(B$(K1,K1))-K1:005
2560 IF B0(K1,K2)="C" THEN BB(N)=00(N)
+K1
2670 IF B$(K2,K3)="0" THEN BB(N)=BB(N)
+K2
2604 IF B$(K1,K1)="M" THEN B0(N)=00(N)
+K2
2594 IF B6(K1,K2)="S" THEN 0004)=0004)
+K4
2600 IF B0(K2,K2)="K" THEN 00(N)=00(N)
+K0
2604 IF K(K3 THEN GOTO L3
2647 IF 0L(K1)<>6 THKO 0L(K1)=0L(K1)+
K1
2603 IF B0(N)=K16 THEN 0L(N)=K2
2604 IF B0(N-K3)=K30+K1+9CA THEN BL(K1)
=K4
2500 IF 00(N-K0)=K16+K2+CA+CK THEN BL(
K1)=K0
2610 GOTO L3
2500 Y=K0:F00 5=K1 TO K4:Y=Y+0CO(5):00
N1 5=IF Y=K16 000 0I0(N)=K10 THEN 0000
2020 IF Y=K0 THEN 000
2050 I=K1+INT(N/K2)+K1-N:IF 00(N-K1)(K
00 THKN P0=K5+INT(900(0-K1)-K1)/K5)
2060 P0=K5+INT((+00T0-K1)/K5)
2066 IF Y=K10 THEN 6000
2670 IF Y=K12 00 Y=K14 00 Y=K20 THEN 6
100
2600 IF Y=K16 000 N=K0 00 N=K( THKN 01
04
2090 IF Y=K16 THEN GOTO L4
2100 IF Y=K20+KI 00 Y=K30 000 BB(N-K2)
(K40 THEN 6100
2110 IF Y=K20+K2 00 Y=K30 THEN 0300
2120 IF Y=K10K2 006 N=K5 000 BB(N-K4)
=C00 THEN 0100
2130 00 BL(Z)+01 GOTO X140,2100,2150,2
204,2110,2220,4000
2160 IF 00T0)+00X(Z) THEN GOTO L4
2164 IF SY(I)=K0 THEN 60500 4000
2166 IF 0e3(Z))=K10 THEN 2106
2170 00(N)=P0+SY(I) GOTO L7
2150 00(K1-K16:0L(X)=KI:GOTO L7
2170 GA=K0:F00 N=K1 TO K2K IF ZBT(CC0,
N)/K1I3-C(N,N)/K1I THEN GA=GA+K1
2150 00NT N
2190 BB(N)=00TB+K1+GA:0L(Z)-N2:GOTO L7
2200 00(N)=00TB+K1:0L(Z)=K4:GBTO L7
2210 CK=K0:F00 N=K1 TO K12:IF ZBT(CC0,
N)/K1I3-C(N,N)/K1I THEN CK=CK+K1
2114 0KNT K
2110 BB(N)=00IB+KI+CN:0L(Z)-K0:GOTO L7
2120 F00 N=K1 TO K1I:IF CBT(CC0,N)/K13
)=C(N,N)/K1I THEN GA=GA+KI
2125 00NT X
2130 PB9 X=K1 TO K1I:IF C(N,N)/K12-ZBT
(C(N,N)/K12) THEN CK=CK+K1
2135 00NT X
2140 P0 &TOE0-KGA(K4-KA1-K00TNT((K4 CK
)/K2)
2150 00(N)=SY(Z)+P0-K5:0L(Z)-K6:GOTO L
7
6000 IF P)K20 THEN 4100
0010 IF P)K3MK5 THKN 4120
4020 IF P)K12 THK" 4200
6030 IF P)K0 THEN 4200
5000 00(K)=K50:B$="00055":GOTO L2
4005 00(K)=K46:B$="00L":GOTO L2
4100 IF SU(50+CK0))1)K0 THKN 4220
4110 00(K)=K10:GOTO L2
4120 00 SU(K0) GOTO 4150,4146,4150,410
0
4130 00(K)=K1:GOTO L2
4140 00TK)=K7:GOTO L2
4150 00(K)=K0 GOTO L2
4100 00(K)=K20+K1:GOTO L2
4900 IF SU(50(CK0))1)K4 THKN 4220
4210 00(K)=K0:GOTO L2
4220 00 SU(K0) GOTO 4230,4246,4150,420
0
4230 00(K)=K6 GOTO L2
4240 00(K)=K GOTO L2
4250 00(K)=K7:GOTO L2
4260 00(K)=K4:GOTO L2
4200 IF SU(50(CK0))7 THEN GOTO L4
4310 NN SU(K0) GOTO 4320,4330,4340,435
0
4320 BB(K)=K1I:GOTO L2
4330 BB(K)=K2I GOTO L2
4340 BB(K)=K1I:GOTO L2
4350 BB(K)=K14:GOTO L2
4500 B$=STO$(INT((00(K0-K1)/K5)+K1)
4510 0N 00(K)-K0+INT((00(K)-K1)/K5) GO
TO 4510,4520 4540,4500,4960
4520 B$(LEN(B$)+K1-"C":GOTO L2
4530 B$(LEN(B$)+K1)="M":GOTO L2
4540 B$(LEN(B$)+K1)="K":GOTO L2
4550 B$(LEN(B$)+K1)="S":GOTO L2
4560 B$(LEN(B$)+K1)="NT":GOTO L2
4600 IF B$(K1,K1)="P" XOEN 0I5(N)=K1:G
OTO 4620
4610 BTB(N)-K10
4620 P05TT100 (N-K1)*K10+K2,L:? B$;IF
00(N)(K40 THKN 4010=B0(N)
4630 N=N+K2 IF N=K0 THKN N=K1:L=1.4K1
4640 N=N+K1
4650 GOTO X900
4700 Y C00$(K10);:04T000
4710 Y C00$(90);:04T000
4720 ? CA0$(KB);:04T000
4730 ? C00$(LIZ));:04T000
6000 TRAP 5000:C00=K1:TR=K1:P05ITI00 K
6,K10;? "DECLARED ?  .I(K0),I(K1,3*K1),B
 4 CH    ","+","*","=","#";:INPUT A0$ IF
5010 POSITT00 K0,K12:? 'COOTOOCT I5
","+","*","=","#";:INPUT A0$ IF A0$(K1,K1
)="C" THEN T5000=K1
6012 IF A0$(K1,K1)="M" THEN TRUMP=K1
6014 IF A0$(K1,K1)="K" THEN TRUMP=K3
6016 IF A0$(K1,K1)="S" THEN T5300=K4
6020 0=0AL(C00$(K1,K1)):DUM=DEC+K1:IF B
UM)K4 THKN DUM=DUM-K4
5030 ? CU0$(LIE$):GOSUB 900 P05ITT00 K0
,K0:? A0$
6000 CC=K0:CLCH=K0:F00 0=K1 TO K4 0A3(
N)=K0:0NXT N:0=0+C+K1 PLAY=K0 IG=K0:05
=K0:IF N)K4 THKN N=K1
9000 CZ=K6 GOSUB 5300:IF TE=K24 THKN R
up
9001 IF PEEK(764)=28 THEN 000
6003 IF TE=K1 AND PLAY=K2 THEN 00 N 60
500 950,900,900,970
6006 Z=K0+CBT(N/K2)+K2-N:IF 0<K1 000 0
UM<)K3 00 (N-K1 900 N=00M1 THEN 605U0
9000:GOTO 0000
9970 G0508 0000
6000 G0500 0000:00 ZBT(CC(N,K1)-K11/K1
I3+K1 GOSUB 4900,4910,4920,4930
0002 IF PLAY=K1 THEN SUPL=INT((CC(N,N1)
-K11)/K1I3)+1
6009 BI0=PLAY1=C(N,K1):CF CC=K0 AND C0
=K0 000 C(N,N11)=BTG0 THEN NICH=C(N,K1)
 00N=C NIN=N
0050 Y C5(C(N,K1),C(N,K1)):C5(CC(N,K1),
C(N,K1))=" ":IF N=K3 900 B(>P00( THEN G
0500 900
6695 IF B(>P00( THKN 0100
9050 00 B0N G0500 900,960,900,970
0100 PLAY=PLAY+K1:N=N+K1:IF PLAY=K0 TH
EN PLAY=K1:TR=TA+C1:S0500 G0N0:B=0IN:T
0PL(K1)=K0:TOPL(K2)=K0:N1=K0:N=K0:00=00
0120 CF B=K0 THEN B=K1
0130 GOTO 5000
6500 N=K12
0510 C=C(N,N):IF C5(C,C1)=" " THEN 0530
0520 IF C)K1I+SUPL-K13 900 C(C+K1I+SUPL
 THEN N1=N 04T000
0530 N=N-K1:IF N<K0 THEN 04T0NN
0540 GOTO 5910
5900 N=K1
5960 C=C(N,N):IF C5(C,C1)=" " THEN 5900
0570 CF C)K1I+2000L-K1I 900 C(C+K1I5+SUPL
 THEN K1=N:04T000
5900 N=N+01:GOTO 6500
0000 IF P(K13 THEN GOTO L6
0010 CF P)1F THEN 0005
0070 CF 00I0)K0 THEN GOTO L4
0030 00(N)=5N:GOTO L7
6200 IF 00(N-K2)=K30 TOEN 900(K1=P160T
0 6000
0LL0 IF B$(N-K0)=K1 THKN 6300
0120 IF BB(N-C1)(K7 THKN 6400
6130 IF 00(N-K1)(N11 THKN 0000
0100 B09(Z)=0B(N-K2)+0/K2+IBT(90(50(C0
```

```
))/K3)
0210 GOSUB 9000:IF S%(K0)=5:IF S=K1 THEN 7540
7610 FOR T=S-K1 TO K1 STEP -K1:IF S%(S
UM(K0))=S%(T) OR P(SUM(K0))<>P(T) THEN S
UM(K0)=T
7620 NEXT T
7630 M$(T)=SUM(K0):GOTO900
7700 IF POKE(0)=K0 THEN GOSUB 7800:IF M
AN(N1)=N0 THEN 6800
7710 CPL=MAN(N1):GOSUB 9700:IF X=K0 THE
N 8000
7720 IF TOP$(CPL,K1)<>K0 OR TOP$(CPL,K2
)<>K0 THEN 500:CPL=CPL+CHR$(8705
7730 B=K1:IF N1<K1 THEN B=-K2
7740 N=N+B:CPL=TRUMP:GOSUB 9700:N=N-B:
CPL=MAN(N):IF N<K0 THEN 8000
7780 SUPL=CPL:GOTO LZ
7800 COUNT=K0:B=K1:IF N)K2 THEN B=-K2
7810 N=N+B:GOSUB 2800:N=N-B*5-B*4:COUNT
=K0
7820 IF S%(S)<>COUNT THEN 7880
7830 S=S-K1:IF S=K0 THEN 7870
7840 GOTO 7820
7850 IF S()TRUMP THEN 8400:N(N1)=S:COUNT=K
0:RETURN0
7880 GOTO 7810
7870 COUNT=COUNT+K1 IF COUNT<K7 THEN K
NORT=K0:RETURN0
7890 S=K4:GOTO 7820
8000 POKE 752,K0:POSITION K0,0:? "@" :IF
SOPL=TRUMP IF PLAY()N1 THEN CPL=SUPL:GOSU
B 9700:IF X()K0 THEN PSUPL=N1
```



Tired of typing?

Take advantage of our finger-saving offer on Page 60


```
8010 POKE 17,K0:ST=SYS(USR(ADR("hex_machine_code_string")),FOR O=K1
TO 15:READ D
8022 IF ST=K14 THEN ? "@":
8030 IF ST=K7 THEN ? "^":
8040 IF ST=K11 THEN ? "<":
8050 IF ST=11 THEN ? ">":
8060 IF ST=15 THEN ? "?"
8070 D1=PEEK(1661):IF D1=K1 OR D1<9 OR D
1>KOR THEN O3=K40:O2=D2
8080 IF O3=K4 OR O3=K10 OR D1=K1 THEN
O2=D2-K1:O3=I9
8090 IF O1=K5 OR O1=K11 OR D1=K2 THEN
O2=K14:O3=Z0
8100 IF O2=K5 OR O1=K11 OR D1=K2 THEN
O2=K1:O3=K12
8110 GET CARD,COOR
8120 IF CARD<100 OR COOR>329 OR COOR=1
44 OR CARD=K24 OR CARD=I91 OR COOR=700
 OR CARD=211 THEN ? CHR$(253):GOTO 800
0
8130 CHO N=K1 TO K12:IF C$(C*N,N1,C*N,
N)=CHR$(CARD-100) AND D2)=C*(N,N1 AND
C*(N,N)=O3 THEN N1=K
8140 IF PSUPL=K1 AND INT(COOR-K13/K13)+
K1()SUPL THEN ? CHR$(CHOI):GOTO 2690
8170 NEXT N:POKE 752,K1:C*(C*N1,N1)=IF P
LAY=N1 OR (C)K13060RL-K13 AND C(=K1305
OPL1 THEN RETURN
```

```
8130 C$=K1 IF T0000()K0 AND C)K13*T000
0-K11 AND C(=N1*T0000 THEN C0=K1:GOTO
 8160
8140 RETOOO
8150 GOSUB 9600:IF C2=K1 THEN 8170
8160 IF C(NTD*CI-K1) THEN RETOOO
8170 OA$=Z*XCO=N:RETOOO
8200 A=ZS-KIPAO-KAMTAT(IKO-N)/KO):K=A+
KPMO-KAMZIAT(K/K4) PMSJTTOO A,N:GETURN
8300 POSITZOO K6,K0:? "MCIOOPO 25 "; OR
 NEN GOSUB 8910,8670,8500,DEVB:IF WZO=
K1 OR NCN=K1 THEN 8525
8310 E$=E$+K1:GOTO 8520
8520 W5=W5+K1
8570 POSITZOO K0,K1:? "W/5";W5;? "E/W"
;E$
8630 IF STOT$(K0)<>K0 THEN 8695
8640 FOR N=K1 TO K4:GOSUB 8500:? "  ";
NEXT N
8650 RETOOO
8660 ? "SOUTH" RETOOO
8670 ? "WEST " OOTOOO
8680 ? "SOUTH":GETOOO
8695 ? "NEST ":RETOOO
8800 GOSUB 9000:TP PLAY=K1 THEN NXGR=N
0:POX=K0:GOTO 8750
8810 CPL=SUPL GOSUB 9700:IF K()K0 THEN
 8860
8814 C2=N1:GOTO 9000
8822 IF SUPL()T0000 AND T000P()K0 THEN
 GOSUB 9500:IF C3()K1 THEN GOTO LZ
8830 TP TOPL(N1)=N1 OR TOPL(K2)=K1 FOR
N GOTO LZ
8840 TP PLAY=K2 THEN B730
8850 GOSUB 8900:TP C(N,X1)(NIGO OR (PL
AY=K3 AND N=K1 AND C(N,K1)=STP(PLAY-K1
1*K1)) THEN GOTO LZ
8880 IF PLAY=K4 AND POK()Z YOOO N=N1X:
GOTO 8990
8870 IF PL67-K4 THEN GOTO L3
8680 GOSUB 5900:A3=X1
8850 IF C(N,N1)>A3O THEN C2=C(N,X1):N
X=N1:GOTO 8900
8700 X1=K3-K1*X=X1:IF X=K0 THEN 5900
8700 GOSUB 8910:IF A=K0 THEN 5950
8710 GOTO 8850
8720 IF TOP$(SUPL,N1)>K0 OR TOP$(SUPL,
K1)-K0 THEN GOTO LZ
8725 IF TOP*K0-K0 AND T0(K1 AND PLAY()K
I THEN GOSUB 9150:IF TOP(OOOP THEN GOT
O LZ
8730 IF TOP$(SUPL,K1)<K0 THEN GOSUB 69
00:IF C(N,N1)>OKI(PLAY-K1) THEN TOPL(X
)=K1:RETUOR
8740 GOTO LZ
8750 IF T0(=K0 THEN T500
8755 KG500 9550:IF YOP)=NCIO THEN 9100
8767 GOTO 7600
8900 GOSUB 5000 500L=5:IF TOUAP K0 AND
 OOK(Z)()K0 AND 5()000(Z) THEN GOSUB 8
000
8750 IF (TOP$(SUPL,K2)(=TME9(SUPL,K2)
AND TME9(SUPL,K1)>K0) OR T0(5(SUPL,K2)
=K0 THEN TOPL(Z)=N1:GOTO 9000
8770 CPL=SUPL:GOSUB 9700:IF K<K0 THEN
 GOTO L7
8800 IF TAP)K1 THEN GOSUB 5000:SUPL=5
8810 IF SOPL()TRUMP THEN 8020
8820 SUPL=INT(POO(D)*84+K11 IF SUPL=IN
PUT THEN SUPL=ASC(PEEK(D)*84+K1)
```

```
8010 CPL=SUPL(50930 5900:IF X=K0 THEN
9012
9020 K1=X:GETNUM
9060 NUM(Z)=CPL:GOSUB 9730:IF X=10 GO
0 9010
9060 IF I$<>NUM(Z),K1)+I$<>(30X(Z),K2
)):0 THEN SUPL=90EXE(Z):GOTO NUM
9100 A=K1:B=NPR:IF B=K0 THEN B=K1:B=-K
1
9100 CPL=SUPL:GOSUB 9700:IF X=K0 THEN
K=X-W K1=K2:GETNUM
9110 GOSUB 9950:IF E1)C(D,X1) THEN H=0
-B X1=X2:GETNUM
9120 H=H-B:GOTO 8730
9150 GOSUB 9910
9160 IF C(N,K1))KEGO TOEO GETNUM
9170 K=X=X1.IF X=K0 IOEO GOTO L2
9180 GOTO 8900
9200 I0=:E0*F00 S=K1 TO K4:F30 NUM(X=K1
 10 $2:!OP5($,NMBE)-K0:9E01 0030:NEXT
0:C=K2 0=X2:P400=C=K1:IF A)K2 IOEN 0-=K2
9410 C=C-K1:IF 0<=K0 TOOX GETNUM
9910 IF NUM<=K2 THEN NUM0=K1:K=-0-0
9610 IF C5<C,C>=" " TOEN 9040
9680 K=K13
9800 IF W )0 9DHN 30 NUM< GOTO 9050,96
90
9060 IF C(N,X)=C IOEO TOP=T30+K1:T90$(
INT(C-K1)/K1))+K1,NMBE)=109$(INT((C-K
1)/K1))+K1,NUM0E)+K1:GOTO 9910
9070 X=N-K1:GOTO 9060
9080 N=N+8:NMBE=NMBE+K1:GOTO 9600
9050 N=N-W*NMBE+K1):C=K150)0T((C-K11/K1
1(+K1:GOTO 9610
9100 IF TRUMP=K0 THEN 0>NH
9110 CPL=TRUMP*60500 9700:IF X=K0 I9E0
 0750
9110 COUNT=30:IF N=K4 THEN 0=-K3:N=N+0
:GOTO 9150
9120 0=K1:N=N%6
9130 GOSUB 9900:N=N-N-0:IF N()K0 TOEO 90
0<:TRUMP:GOTO 9170
9140 COOOT=COOOT+K1.IF COOOT=K2 IHEN C
OUNT=K0 GOTO 0730
9100 IF 0=K1 IOEN D=K5(N=0900;GOTO 9120
9100 0= 01(N=N%6:GOTO 9130
9170 IF !OP5($UPL K1))00 00 !OP5($UPL,
K2))K0 THEN 0%N
9200 GOTO L2
9250 IF N=DHM 30 N=30C THEN OEE0=5640
GOTO 9170
9500 OEE0=K0-0
9270 IF NCHI 00 N-KJ THEN OEE0=OEE0-05
 GOTO 9296
9300 OEE0-OEE0-EN
9290 GETNUM
9300 S=K4*F00 T=IE IE K1 STEP -K1
9410 IF TOP5(5,E1)+!OP5(5,E2))!OP5(T,N
1)+TOP5(T,X2) THEN 9420
9415 IF TOP5(5,E1)+!NP5E5,E2))=!OP5(I,E
1)+TNP5(T,X2) THEN 9480
9420 5=5-K1:IF 5=K0 IHEN S=1:POP :SETO
AN
9425 GOTO 2410
9430 NEXT T:GOE1000
9450 IF TOP5(5,E2))!OP5(T,K3) 30 T=T30
30 THEN 9430
9400 GOTO 9420
9500 C3=PLAY
9610 IF 010(CI-K11)X1I%(!OUMP-K1I 0AN 0
20(C3-K1)(=K1%!OTUMP !OEO GETNUM
9620 C3=03-K1:IF C3 01 TOEO GETNUM
9650 GOTO 9610
9700 X=KE4
9710 X=X-K1:IF X=K0 THEO AETNUM
9720 IF C$(C(N,X),C(N,X))=" " THEN 971
0
9730 IF C(N,X)?E1I%CPL-K11 000 C(0,X)(
-K1I%CPL IOEO OETOOM
9740 GOTO 9710
9800 IF SUPL=!OUMP 30 !OUM0 40 IHEN 99
80
9810 CPL=!OOOO GO930 9700:IF X=K0 !OOO
 9940
9820 GOSUB 9530:IF C1=K1 IOEN 9920
9840 IF C1()PLAY THEN 9980
9850 C=K1I
9860 C=C(N,X):IF C$(C,C)=" " THEN 9600
9870 IF C)K1I%!OUMPP-K1I 000 C(=K1I%!OU
MP THEN 9980
9880 X=X K1 IF X=K0 IOEN 9940
9890 GOTO 9800
9900 IF 010(PLAY-K1I)<C THEN 9980
9910 K1=K(=00N=0:C=-K1:0E!000
9920 IF (NPL(X1=K) 30 (PLAY=K4 0N0 00N
=Z) !OE0 9960
9930 C5=SUPL SUPL=!OUMP GO500 5900 500
L=C5:000 N C5=K1 0E!000
9940 C5=020 N1=K0 P00 CPL-K1 TO K4 N=X
14:IF CPL !OUMP THEN 9930
9200 K=0-K1:IF K=K0 IOEN 9230
9250 C=C(N,X) IF C5(C,C1=" " THEN 9260
9270 IF C)K1I%CPL K11 000 C(-K1I%CPL A
30 C-K1I%101((IC K11/K1I)(=C5 THEN C5=C
-K1I%I01((IC K11/K1I) K1=K-GOTO 9270
9280 GOTO 9950
9950 OEXI CPL:IF X1()K0 IOE0 OETOOM
9970 GOTO 9930
```

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	1517	2	3791	3	6681
0	3517	5	8942	10	10000
11	11001	14	12196	15	13991
16	17501	17	11480	00	14015
100	2240	126	5726	230	1251
220	5766	200	1204	320	5706
400	3249	410	1510	500	1570
700	13500	900	1000	900	10360
960	10114	970	10190	1000	6597
1010	11930	1020	1175	1025	5001
1030	6410	1040	8197	1000	6406
1060	1490	1000	10176	2010	17007
2010	9250	2010	4200	2200	5111
2250	8651	2270	2502	2200	1107
2230	9797	2300	1125	2310	1090
2500	15450	2530	17501	2570	9701
2523	4757	2510	4741	2525	7010
2500	7002	2550	8701	2500	5350
2570	8001	2600	0007	2590	3020
2500	5017	2001	1751	2002	5930
2001	0015	2100	0150	2000	7200
2010	1079	2000	13107	2010	1207
2010	1320	2010	2505	3000	1007
3050	12110	3055	0422	3000	3004
3070	0477	3000	0121	3090	3725
3100	0475	3110	5057	3120	0701
3130	7750	3140	5440	3150	4947
3160	0507	3170	0137	3190	4021
3190	13250	3200	1175	3205	10150
3200	0710	3210	11197	3215	1175
3215	0017	3220	10057	3225	1175
3230	10721	3235	1175	3240	5055
3250	5001	4000	1023	4010	3021
4020	1075	4010	2507	4040	0510
4045	4055	0100	4504	4130	7201
4135	0004	4110	2923	4100	0907
4190	1701	4160	7717	4200	4549
4210	1519	4220	5076	4230	1943
4240	1927	4290	1931	4260	1515
4300	0522	0210	5072	4320	1240
4330	1251	4340	1295	4390	1201
4000	0100	4510	10170	4520	0205

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
4530	0240	4540	4200	4550	4251
4560	4710	4500	7010	4010	1705
4020	10020	4030	0045	4040	1071
4050	1052	4000	1090	4110	7012
4120	2574	4930	2736	5000	10101
5010	15005	0012	0559	5014	0079
5015	5502	5020	10214	5025	7020
5040	11700	5050	7021	5052	4711
5055	9220	5000	10570	5070	1970
5000	11957	5002	6421	0000	10100
5090	11720	5095	1700	6070	0001
5100	5000	5120	2004	5122	1076
5500	907	0910	0171	5520	5110
5530	5460	5500	1007	5750	930
5700	5100	5750	9214	5700	2965
0000	1000	0010	0020	6020	0141
0010	1101	0100	7004	6110	0000
0110	0400	6130	4442	0230	7542
0210	0025	0300	0393	6100	9507
0310	7420	0320	10021	6330	0000
0400	0790	0410	11105	5015	1002
5420	7717	0040	7211	6000	4510
0500	11229	0010	0590	0520	3750
0000	0072	5010	15017	5010	1007
0540	1920	0000	10015	5000	0770
0070	0000	0000	11000	0090	1450
0092	11700	0094	3011	0096	1050
7000	7521	7010	10140	7020	0500
7030	0000	7000	1100	7050	0005
7020	0096	7530	10090	7515	1007
7340	11497	7045	1215	7550	11410
7502	9010	7500	1000	7500	0179
7570	11000	7000	0002	7090	2919
7630	0100	7010	10092	7020	1307
7010	0197	7700	9029	7710	7040
7700	11492	7720	0201	7740	11731
7750	5115	7000	0000	7010	00500
7020	0070	7010	4700	7050	1052
7050	0050	7000	1090	7070	9504
7000	2059	0000	10151	0010	0049
0020	1502	0010	1211	5000	1001
0050	1577	0000	0019	0070	5070

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
0000	7711	0090	7027	0100	7911
0105	12150	0100	19020	0110	15900
0115	12120	0120	10712	0130	10111
0140	1450	0150	5474	0160	5200
0170	0211	0100	11004	0500	10070
0010	1150	0520	1501	0530	0040
0535	4055	0540	0902	0550	1000
0000	1207	0570	1000	0000	2100
0090	1114	0500	9701	0010	7149
0010	2075	0020	11004	0030	0101
0040	1255	0050	10412	0060	0120
0070	4071	0000	1040	0090	0701
0700	5701	0705	0105	0710	1510
0720	10204	0725	10720	0730	10101
0740	1070	0750	2711	0795	5049
0757	7575	0700	14040	0700	13250
0770	7270	0000	0505	0010	4995
0015	17295	0020	7041	0030	2001
0000	0179	0000	11512	0500	0110
0505	10207	0510	5127	0520	2004
0550	1570	0500	0000	0570	5040
0500	1005	0000	11295	0010	5000
0020	0004	0030	4050	0040	007
0050	0575	0000	10275	0070	1040
0000	4017	0095	0040	0150	1577
0110	7210	0115	0110	0120	1052
0110	10100	0100	10127	0100	5003
0150	1000	0170	0501	0100	1070
0200	7002	0200	2000	0270	0271
0200	2095	0290	1000	0000	0211
0010	10002	0015	10502	0020	7107
0070	1000	0000	1100	0000	0002
0050	1000	0000	1020	0510	11501
0520	5711	0530	1001	0700	000
0710	0000	0720	5007	0710	0000
0740	1005	0000	7000	0010	7217
0020	5000	0040	0000	0000	007
0000	5100	0070	0120	0000	0715
0090	1012	0500	4001	0110	0005
0120	0000	0130	11040	0500	10001
0050	0750	0000	5101	0570	10703
0000	1011	0090	0100	0070	1701

Of worms that turn not up, and a nasty line in operatic phantoms

By Brillig

ONCE again printing deadlines have defeated my good intentions I promised last month to review Worm in Paradise and although the game is probably, as you read this, the best selling adventure out for the Atari, unfortunately I have yet to receive a copy to review

Never mind as a special treat for Level 9 fans I intend to do a feature on the full trilogy So next month prepare to enter the silicon dream world of Level 9

I have however been able to keep the other half of my promise and review Asylum from Screenplay not a company I have come across before This is a translation of the original from the TRS 80 (the what?) and Apple

First of all let me explain that the Asylum in question is designed for the likes of you and I (and not before time for some of us) where adventurers are sent to recuperate and at the same time try to escape to the real world

You are not alone in this enterprise as behind the multitude of doors in this complicated maze structure lurk your fellow inmates all eager to assist or obstruct or just plain irritate

The game is a graphic adventure and the graphics vary between the simple but effective grey walls of the maze to the cartoon like features of the other loonies entrapped

Movement is in two forms either via the cursor keys to manoeuvre around the extremely complicated maze, or by the more traditional text parser for opening doors and collecting objects

The game has a good authentic feel as you plunge around the corridors You can barter with or ignore your fellow prisoners

It also has some interesting and useful additions to the normal adventure game You can list out the vocabulary to see if you are barking up the wrong tree and the availability of an abbreviation single keystroke for commands such as lock and unlock save many a nasty case of typist's finger

Finally there is a slide show feature which allows you to witness screens from the game although this will not be of too much assistance in solving the game

Overall this is the most playable graphic adventure I have yet come across and at £9 95 represents very good value

Also in the very good value stakes is Opera House from Bignose Software a spooky tale of an aspiring Pavarotti who finds that the theatre of his dreams lies derelict under the curse of The Phantom

In order to avoid the ignominious return to the chorus line the hero has to banish the Phantom from the theatre a tough task as he turns out to be an elusive chap with a tendency towards clobbering you over the head if you let your guard drop for a moment

The style of the game is verb/noun with a screen layout in the image of the early Scott Adams adventures Progress around the locations at first is easy with plenty to explore and lots of objects to juggle with Leaving the Opera House is problematic however as you then have to locate the Phantom's lair and there is only one way back in

Humour abounds in the game especially if you try to act out the role and the usual Bignose play on obvious verb/noun commands is there

I'm sure they only included a window for one purpose It gives the impression that the game has been written by adventurers for adventurers rather than as an exercise in programming skill and technique and is all the more playable for that

At £5 95 for the cassette and £9 95 the disc the game is excellent value

Scott Liddle among others has



been having a bit of trouble with the screening door in Hitch Hiker s Guide to the Galaxy from Infocom

In view of last month s furore I shall not reveal the full answer Suffice it to say that when you have demonstrated enough grey matter then the door will allow you to progress it knows what the score is

If you are having trouble amassing points in HHGTG try being kind to animals or being a bit of a boozer Every little helps

For those of you stuck in the vast expanses of Zork I a little light-fingered assistance might help you to go to work on that egg Also that black book may be a mass of help in ridding yourself of unwanted company

If that rings any bells then it should also help you throw some light on the subject

That s all for this month Remember I need lots of glitches – especially an Infocom one – and next month is a sci fi special with Level 9 Happy adventuring

Glitchless into '86

ON to weightier matters Where have all the glitches gone? Last month I used up the last of my current stock Is not the thought of an *Atari User* T shirt for free enough? Please send those glitches in, as apart from anything else, it keeps the adventure writers on their toes

For instance, did anyone else notice the lengthy defence that Level 9 gave to their input analyser in the blurb for Red Moon which could occasionally throw up the odd strange message?

Other useful submissions are maps of completed games or hints on solutions

Simon Ashford, of Sirmingham, a previous glitch winner, has sent me a comprehensive map of Channel 8's Golden Seton So in case you are having problems with the Gorgon, try reflecting on your possessions in order to progress

You may also find more than just a needle in a haystack when you visit the shed Thanks for your tips, Simon I m sure you will have helped someone somewhere with those

THE PRODUCT OUR COMPETITORS WERE NOT WAITING FOR...

The True Multi Standard International Modem



£79.95 EX VAT

OUR MODEMS SPEAK FOR THEMSELVES

- Multi-standard V21/V23
- Autodial/Autoanswer
- BT approved
- Hard wired/in line with phone
- Telesoftware downloader*
- Full RS232 — optional
- ROM based software
- US Bell tones optional
- Auto baud scan — optional
- Portable computer battery charger — optional
- Hayes compatible — optional
- V22 1200/1200 Full Duplex — optional
- Free BT Gold Mailbox and/or Free Easilink Mailbox

*Prestel Micromagazine approved. Prestel is the official trade mark of British Telecom PLC

Please rush me:
Item Qty £ each Total

I enclose cheque/PO for £
Or charge my Access/Visa Card No
Signature
Name
Address

Please make cheques payable to MODEM HOUSE and return coupon to address opposite

Compare the facility offer modem. Similar high quality software solutions available for Amstrad, Commodore, Atari, BBC Micro, Apricot, Sinclair, IBM etc.

Voyager 7 £91.96 incl VAT
Voyager 11 £114.95 incl VAT
Further use with any home Micro
Complete communications pack for:
Atari 600XL 800XL & 130XE £185.95

MODEM HOUSE

OFFICIAL BBC DISTRIBUTOR

Approved for use with telecommunications systems run by British Telecommunications plc in accordance with the conditions in the instructions for use.

Made in Britain

Fighter Pilot is right on target



IF you've ever fancied your chances as a jet pilot then Digital Integration's **Fighter Pilot** should appeal to you.

This aircraft simulation puts you in the pilot's seat of an USAF F15 Eagle jet fighter with options to allow straightforward flying or air to air combat with enemy fighters.

From a menu of options you may choose to start your flight from take off position or landing approach. My disastrous attempts at landing soon convinced me that it was much easier to opt for take off.

Taking either of the combat options starts you off in mid-flight around 20,000 feet. You may select combat practice where you are positioned two miles behind the enemy plane at approximately the same height.

If you can keep tail on the enemy it will appear in your gunsights at a distance of one mile at which point with a little bit of luck you can blast it out of the sky.

In practice mode the enemy doesn't fight back but with some experience you may like to attempt true air-to-air combat.

With this option you will track the enemy with the help of your on-board computers before shooting it down.

Be warned though, the enemy returns your fire and it becomes a real dogfight.

If you really want to live dangerously you can lob in crosswinds and air turbulence not to mention a blind landing in foggy conditions.

The screen display is excellent. The top section is the pilot's cockpit view in which you see the horizon, the runways on approach to landing, and of course the enemy if you are in combat mode.

The lower half is taken up by the instrument panels.

There is quite a lot of detail to digest here and one soon learns the importance of keeping an eye on the most important instruments.

Quite often I found myself carefully holding a correct course while paying no attention to the fact that altitude was rapidly approaching zero.

The cockpit view can be changed to display a map of the area on which can be seen the four runways and various navigation beacons and so on. Any enemy aircraft in the area are also identified if you are in combat mode.

I must confess to being a flight simulator addict and I was particularly pleased with this program.

The instructions are adequate, all the available options are described together with the instruments and controls and there's a little technical information to help you gain some flying experience.

The program also incorporates one of the latest innovations aimed at thwarting software pirates – Lenslok. For the uninitiated this is a plastic lens that is folded and placed against the screen in order to read a security code.

It is quite easy to use and there's an optional tutorial mode to help you if you're at all uncertain. The protected program will only run if you enter the code correctly and a different code is generated each time the program is loaded.

Hopefully developments like this will help to reduce software piracy. I certainly hope so because the program authors deserve their just rewards. It's a fine program and I enjoyed it immensely.

David Andrews

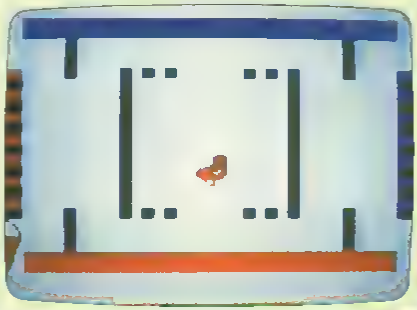
Mr Men do a good job

MR MEN books, ugh! Besides their obvious sexist bias the story content never appealed to me. Why do young children love them?

I can appreciate that their simplicity is attractive but how boring having to read them time and time again to my three year old.

I was aware that certain lesser computers had versions of Mr Men programs but I always congratulated myself on my choice of Atari because such programs were not for it.

Well Mirrorsoft has produced an Atari version of the highly successful set of programs **"First Steps with the Mr Men"**.



With fear I loaded them dreading the possibility that the magic moments I spend with my children learning Logo might be invaded by little fat men that had recently ruined the bedtime reading session.

There are four games in the set. They feature Mr Greedy, Mr Silly and Mr Forgetful.

The Great Ice Cream Hunt involves the child directing Mr Greedy around the screen to find a specially enormous ice cream.

It gets harder both for the child and Mr Greedy as he collects ice creams. Decisions have to be made about which way to send Mr Greedy.

This is similar to early Logo like activities and helps the child to grasp the concepts of direction while they control the computer.

The game is fun and much

to my surprise the little Mr Men is quite charming and seems well suited to the computer environment

Mr Silly's hat game is a simple matching activity Mr Silly chooses a hat and the child has to find it on the shelves

Again it is fun and the child who showed me how to operate it was quite content playing the game for a considerable period

The colour and graphics are what you would expect from an Atari game and the program loaded and ran without any difficulty

Mr Forgetful has to play the next two games They are similar to the card game where you turn cards over and have to remember where pairs are The child has to match up pairs of socks shoes roller skates and the like

There are two rows of cupboards six in each row and the child directs Mr Forgetful to look into a cupboard

One of the pair will be in the cupboard and the child has to find the other half while accumulating knowledge about what's in the other cupboards

This matching activity is extended to letters in the next game

The Mr Men set of programs from Mirrorsoft are really good for young children They provide a relevant use for the computer both at home and in school providing the child with simple matching and pre reading activities They do this in a fun way

It is good to see that thoughtful educational principles have been adhered to and that at last the little fat man have a useful task to perform

They might leave story books alone although I doubt it

Alan Coode

Stand by with the insecticide

IN **Axis Assassin** from Arolesoft your task is to fight off an army of insects which quickly multiply and attack you in droves It's an interesting version of the wall known arcade oldie Tempest

Each screen holds a 3D grid and your object is to move your man around the perimeter and in and out of the grid in order to fight off the approaching enemy

Battle begins after the Master Arachnid sends out a Spinner to weave strands across the grid With an unlimited amount of ammo you must try and see off the meanies sent after you by firing at them down the corridors

They take the form of Hunters Drones Spores and Xterminators and each has an individual mode of attack and its own points system You have to try to destroy enough of the enemy to make the Master Arachnid reappear

When he does you can zap him with a pulse bomb Alternatively you can race on to a faster more ferocious screen

If you choose to zap the Master and succeed you enter another mode which is rather like an Asteroid game

This time you have to rescue a fellow Assassin who has been captured and lies imprisoned in a central box along with the Master

Shoot away enough of the box to allow you to get in and you can attempt within a set time limit to rescue your comrade without touching the walls of the box or the Master himself

To add to your troubles the other insects float towards you like asteroids Contact with anything means annihilation

If you can rescue your colleague you are awarded an extra man Fail and you lose one Either way you move on to the next grid to start the battle over again

There are three levels of play and 20 different grids each increasing in difficulty

Handily you can start at any you want which removes the necessity of ploughing through earlier screens once you find them too easy

However you would be well advised to start on the earlier screens on the higher levels

The game kept me interested for a while but lacked the variety to make it really addictive The graphics are acceptable but not up to the Atari's capabilities – all the characters and scenery are based on wire frame shapes

It's one of Arolesoft's Mid Price series so the disc will only set you back £9 95 with the cassette costing £2 less

David Andrews



The high price of war

IT seems that every second computer wargame that arrives from the States now is besotted with the German Wehrmacht, and this new release from Strategic Simulations is no exception However this minor criticism should in no way deter any one from buying **Panzer Grenadier**

The Panzer Grenadiers of the Second World War were an elite mobile infantry force trained to move with and support the powerful armoured divisions of the German army

In this program Roger Damon sets out accurately to simulate the desperate actions of this crack German force as it attempts to stem the Russian advance on the Eastern front

You are given the option to either enter a saved game or start a new one choosing from one of five scenarios

Each is set on the Eastern front after the massive German offensive of 1941/42 has ground to a halt and the Russian steamroller has begun to gain momentum The first scenario Bridges over the Lutchessa is an ideal introduction for the novice player

You can select a level of play from one to three which

→

caters adequately for beginners and experienced players alike

SSI has moved away from the normal wargame screen format and given us a very good smooth scrolling terrain map with all features such as woods ridges roads and rivers very well depicted

Troop types are represented by easily recognisable icons and all orders and moves are given via the joystick which helps playability

Play is broken down into eight phases which cover movement and firing for both sides with a victory phase at the end which gives an assessment of your overall play

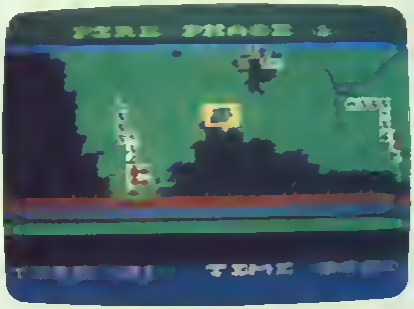
As is usual in SSI games opportunity is given at the end of each turn to save the game

I rate Panzer Grenadier quite highly The game is well packaged and has a well-written easy to follow instruction manual

The program is strong both in graphics and playability However I find it hard to come to terms with a £35 price tag

Also there is no provision for the creation of your own scenarios a major drawback in a game of this type

John Minchin



A colourful starter pack for ST adventurers

BEING the first Atari ST adventures I had encountered I was full of glee when asked to review **The Lost Kingdom of Zkul** and **West**

They are both text adventures and are produced by Talent Software better known for their contributions to the Sinclair QL range

The first thing that struck me was their size Zkul weights in at 73k but West is a smaller 49k Talent tell me that West is purely an introduction to adventuring Be that as it may it is really very small compared to what it could have been on the ST

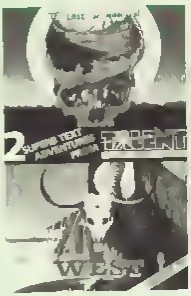
Both games have loading screens To say they are spectacular is an understatement They have to been seen to be believed leaving 8 bit screens way behind

They are both colourful and detailed staying on the screen until you press a key at which point the main game loads

Let's look at West first The vocabulary is reasonably large but mostly I found it limited to two word entry

The plot involves tracking down bank robbers and duly killing them before taking the money they stole back to the bank Dunno this time you will find yourself being promoted to sheriff

The game plays fairly well as far as it goes – it really is for



beginners The biggest problem is that it is in real time Nice idea but if you cannot type quickly then you can find yourself dead as the robbers shoot quite fast and don't wait for you

Anyone who has played adventures before might get bored with West The idea of a western adventure is quite a good one but the plot didn't quite gel for me as there didn't seem to be an objective

However if you have never played a Talent adventure before then it's a good idea to play West just to get used to their system

Zkul on the other hand is quite different The idea is to find as much treasure as possible and return with it to a hut in the great forest where your friend Eldomir waits for you

The scenario goes thus Long ago there was a battle between humans and dwarves The latter won but took heavy losses and so lately there have been very few of the little chaps around

The battle has lapsed into legend but it is said that in the domed city there is lots of loot So you have been sent by your friend to find both city and loot

When you do see dwarves they don't wait around long They can be useful but it's up to you to find out how

So far I have mapped about half of the game and believe me it's a very big adventure to play

If you get stuck just wait a bit and sometimes the computer will offer you a clue However it takes points off your score in payment

There is the standard help and a health command which when entered tells you the condition of your character – very neat.

Zkul is quite complex but not so much that it is impossible to continue without solving a problem Be wary of trap rooms but quick thinking can usually produce a way out of them

If you get stuck in a room with shrinking walls a bit of mathematic progression on a certain word might help you out of it

A strange man appears occasionally and takes all your treasure To get it back you have to find his lair

A strange thing about this adventure is that it does not give you directions in certain places which makes mazes a real headache This does add a touch of reality for you lose your sense of direction in real mazes too

There are plenty of locations to wander about and problems to be solved which combine to make a pleasant adventure that takes a fair while to crack

Zkul is not for the novice but West is The combination makes a good starter pack for novice adventurers It is quite a fair package for the average ST owner and is worth buying just for Zkul With West included at £24 95 it makes an attractive buy to anyone

Jed Glover

ACCESS ORDERS NOW TAKEN

Haystack Peripherals

Atari Software

Haystack Peripherals

5 Midgreve, Delph, Oldham OL3 5EJ Tel: 04577 8230

THIS MONTH'S EXTRA SPECIAL OFFERS!

CREATIVE SPARKS

	Cass
Dominate War	4.90
Dominate Dungeon	4.90
[illegible] Victory	4.90
Double Pack	9.90
Triple Pack	12.80

U.S. GOLD

	Cass
Caverns of Khafka	4.90
Slinky	4.90
Double Pack	9.90

U.S. GOLD

DISC	Disc
[illegible] Factor	8.90
Mis[illegible]down	6.90
Sp[illegible] Invasion	6.90
Double Pack	12.40
Triple Pack	18.00

	Cass	Disc
ACTIVISION		
Ba[illegible] Blazer	8.90	12.90
Decathlon	8.90	
Fi[illegible]ght*	8.90	12.90
[illegible] Am. Road Race	8.90	12.90
Ghostbusters		12.90
Hacker	8.90	12.90
Tennis Rift*	8.90	12.90
Wi[illegible]dsdew*		12.90
Fi[illegible]ll	8.90	
Pe[illegible]son Frosts vs	8.90	12.90
Space Shuttle	8.90	
ANIROG		
Jumpjet	8.40	10.40
ARIOLASOFT		
Ca[illegible]n	9.90	12.90
Ca[illegible]n*	8.90	10.90
Dam Assassin	8.90	8.90
Hi Bug	6.90	8.90
Pyra[illegible]d Cons. Set*	10.40	13.40
Pyra[illegible]d Hat Mack	8.90	10.90
Q.U.E.	8.90	12.90
Rallye[illegible]on Zintlermeul		12.90
Tu[illegible] Cons. Set		12.90
Wa[illegible]on One	8.90	10.90
Wi[illegible]a Cons Set		12.90
Ba[illegible]ball*	16.90	19.90
Ba[illegible]m of Infamess.*	8.90	10.90
Ca[illegible]n Cross/Grid		12.90
Ch[illegible]	9.90	
BEYOND		
Sp[illegible]x Sp[illegible]	8.90	
CREATIVE SPARKS		
Sp[illegible]ke Ile	8.90	
DATABYTE		
Br[illegible]ge Master*	9.90	12.90
DATAMOST		
Mr Robot		12.90
DIGITAL INTEGRATION		
Fi[illegible]ter Pilot	11.40	11.40
ELECTRIC DREAMS		
Spy v Spy Ill	8.80	10.90
ELITE		
Ayden I	8.40	
ENGLISH		
Chess Suey	7.90	10.90
Colossus Chess	8.90	10.90
Elektraglide	7.90	10.90
Hijack	8.90	9.90
Kissin Cousins	5.90	
Mercenary*	7.80	12.90
Smash Hits 1	13.40	16.90
Smash Hits 2	13.40	16.90
Smash Hits 3	13.40	16.90
Smash Hits 4	10.40	13.90
GREMLIN GRAPHICS		
Kng of the Ring	8.40	11.40
Zone X	8.40	11.40
ICD		
Spartacus		36.90
US Gold Ir		69.90
LEVEL 9		
Adventure Quest	8.40	
Colossal Adv	8.40	
Dungeon Adv	8.40	
Emerald Isle	8.80	
Lords of Time	8.40	
Red Moon	6.30	
Return to Eden	8.40	
Snowball	8.40	
Worm in Paradise	8.40	
LLAMASOFT		
Colour Space	8.40	
Hover Bover	5.40	
Mutant Camels	5.80	
MELBOURNE HOUSE		
Mer[illegible]s Quest	5.80	
William Wobbly *	8.80	
MIRRORSOFT		
Brui[illegible]dash	8.80	
MOSAIC		
Sup[illegible] Dary Adv[illegible] Mole	8.40	

	Cass	Disc
NOVAGEN		
Ene[illegible]nder	8.80	11.40
Me[illegible]amary	8.80	40
PRECISION		
Superscript		57.90
PSS		
Th[illegible]at Eu[illegible]one	8.90	
SIERRA ON LINE		
Dark Crysta		26.90
Ma[illegible]n Adventure 3		15.80
Ul[illegible]me I		19.90
Ul[illegible]me II		25.90
Ulysses		26.90
Wiz & Princess		15.80
STRATEGIC SIMULATIONS		
Battalion Commander		33.90
Battle of Antietam*		47.80
Breakthrough Ardennes		54.90
Gettysburg		54.90
Kampfgruppe		54.90
Operation Market Garden		47.80
Panzer Grenadier		33.90
Questron		47.80
Reb's West		33.90
Reforger 88		47.80
Six Gun Shootout		33.90
USAAF*		47.80
Wa[illegible]n Pass		54.90
50 Mission Crush		33.80

Prices include VAT and Carriage

Callers by Appointment only

	Cass	Disc
SUBLOGIC		
Flight Simulator II		44.90
US GOLD		
Aztec Challenge		
Beach Head		
Blue Max	6	
Blue Max 2001	8	
Bounty Bob	8.1	
Brian Bloodaxe	7.90	
Conan		
Crusade in Europe*	7.40	
Dog Fight	12.80	
Gi[illegible]ths	8.40	
Ore[illegible]s Zone	8.40	
Forbidden Forest	7.90	
Fort Apocalypse	8.40	
F15 Strike Eagle	12.80	
Ghost Chase	8.40	
Ghosts	6.40	
Kennedy Approach	12.80	
Lucifer's Realm		
M.A.R.Y Arc	8.40	
M. Dc	12.80	
Nato Commander	8.40	
Pacman	6.40	
Pole Position	8.40	
Raid[illegible]	8.40	
Snake	8.40	
Sea Fight	12.80	
Solo Flight	8.40	
Spitfire Ace	8.40	
Star Hunter	8.40	
Strip Poker	6.40	
Summer Games		
Super Zaxxon	8.40	
Tapper	8.40	
Up N Down	8.40	
Wintermute	8.40	
Zaxxon	17.95	
Zo[illegible]	8.40	

C15 COMPUTER CASSETTE [illegible] 0.95

* Please ring to confirm availability

Cheques (Please write card No. reverse) or P.O.'s to HAYSTACK PERIPHERALS. Please quote ATARI when ordering. P[illegible]

BRANCH NETWORK THROUGHOUT THE U.K.

LONDON
Park House
140 Battersea Park Road
London SW11 4NB
01 627 4840

GLASGOW
11 Bath Street
Glasgow
041 332 1116

EDINBURGH
4 St. Andrew Square
Edinburgh EH2 2BD
031 557 4196

12 Leven Street
Tollcross, Edinburgh
031 228 1111

ABERDEEN
77 Holburn Street
Aberdeen
0224 571735

MICROWORLD

• CALL 01-627 4840 •

ATARI 520ST

FEATURES
1 512K Ram
2 68000 Processor with networking
3 Professional Software free
4 512 Colours on screen
5 8MHz clock speed
6m operating system
Complete system CPU, Disk Drive, Monitor and Mouse included
Free software includes Basic, Logo, Gemwrite, Gempaint

with printer
ONLY £749

Special Offer. FREE [illegible] £299!

How to Order

Orders by post welcome please mail coupon with payment.
Telephone orders welcome call 01-627 4840 (London) or 0532 [illegible] (Edinburgh) or 041 [illegible] (Glasgow) or 0224 [illegible] (Aberdeen).
We also welcome Government and Educational orders.
All products supplied include our own 12 months guarantee backed by our own service centre staffed by fully qualified engineers. Order with confidence. 7 days money back guarantee.
All charges include VAT and carriage charges by courier. Trade enquiries and personal callers welcome. All offers stated here are available through any of Microworld's 5 stores nationwide.
The right is reserved to alter prices without prior notice.
All items subject to availability. E&OE

MAIL ORDER

To: Microworld Dept [illegible] Park House 140 Battersea Park Road London SW11 4NB 01 627 4840

Please send me

I enclose a cheque for £ payable to Microworld Computer Systems Ltd

Please debit my Access/Visa/American Express Account

No Signed

Name Address

P.F. SOFTWARE
SMART ART (16k)

- OVER 80 DIFFERENT COLOURS CAN BE DISPLAYED AT ONCE
- INTERRUPT DRIVEN CURSOR
- 4 BRUSH SIZES
- 3 BRUSH SPEEDS
- AIR BRUSH MODE
- PLOT
- DRAWTO
- FILL
- DRAW BOX
- DRAW CIRCLE
- SAVE PICTURE
- LOAD PICTURE
- SEPARATE PROGRAM TO DISPLAY PICTURE
- DEMO PICTURE

AVAILABLE ON CASSETTE FOR ALL ATARI 8 BIT COMPUTERS ONLY. £5.50
(Previous purchasers of Art Atari can upgrade to SMART ART for only £1.00)

ALSO AVAILABLE

BLACKJACK (16K) Realistic card display £1.95
PICTURE PUZZLE (32K) Two pictures to choose from £2.95
PICTURE TORMENT (16K) Very difficult £2.95
FRUIT SALAD (16K) Colourful version of mastermind £2.95
FRUIT PICKIN (16K) Arcade action £2.95
(Order both FRUIT SALAD & FRUIT PICKIN for only ..... £4.50)

Cheques & P.O.'s to (Overseas orders for single programs please add £0.50)

P.F. SOFTWARE (Dept AU)
14 KIRKSTALL AVENUE
LITTLEBOROUGH
LANCS. OL15 9JA

LADBROKE COMPUTING INTERNATIONAL for ATARI

DIRECT AMERICAN IMPORTS FROM OUR USA BRANCH PLUS BULLETIN BOARD WITH PUBLIC DOMAIN DOWNLOAD SOFTWARE



33 Ormskirk Road, Preston, Lancashire PR1 2QP
Tel (0772) 21474
Mail order (0772) 27236 – 10am-6pm
Bulletin Board (0772) 27236 – 6pm-9am
VISA and ACCESS welcome

SERIOUS BUSINESS OR SERIOUS HOBBY

OUR SERVICE DOESN'T STOP AT JUST GIVING COMPETITIVE PRICES AND A FAST FRIENDLY SERVICE. WHY NOT JOIN OUR COMPUTER DISCOUNT GROUP
SPECIAL ACORN, AMSTRAD & ATARI 520ST SUPPORT SECTIONS
LARGE RANGE OF ATARI 520ST PRODUCTS CURRENTLY AVAILABLE

COMPUTERS

Amstrad CPC6128 from £243.00
Amstrad PCW8256 £368.00
Atari 520STA (Mono/Atari Soft) £599.00
Atari 520STF (Printer/Hard. Disc Special package deal PHONE
Pls ! replacement warranty scheme at business & individuals PHONE
Atari SkiWaxers/Books Wide Range
Atar. SX/Ox Add. Drive £118.00
A an 1M Ads D ive £159.00
Atar 1 8MB Hard Disc £630.00
KECM 520ST P/Mdk/Hard Disc PHONE
KECM 520ST Professional system
Ben t n PSU 1MB Hard Drives PHONE
KECM 520ST Modem Rs 232 Serial £22.00
KECM 520ST Printer Lead £20.00
KECM 520ST 3.5" Drives PHONE
KECM 520ST OTHER PRODUCTS OUT SOON
Atari 520ST Print er Lead £15.00
Atari 520ST Serial Lead £12.00
Atari 520ST Video Leads/Kage/ Miscellaneous Item £10.00
BBC Model B Plus PHONE
Commodore Products PHONE

MONITORS

Kaga Vision £190.00
Kaga Vision 1 £220.00
Microvitec 431 £195.00
Microvitec 1431 £215.00
Philips 7502 £85.00
Philips Colour Range from £185.00
Philips 2100 Ecn ny TV/Monitor £100.00

PRINTERS

Colour Printer Colour £319.00
Canon PW1156A NLQ £284.00
Canon PW1156A NLQ £345.00
CCP40 Colour Printer £70.00
Pa nasonic 2100 £210.00
Epson RX-80 £314.00
Epson FX-100 £425.00
Epson LX800 NLQ £181.00
Epson LQ1500 £527.00
Juki 2200 £235.00
Juki 5520 Colour £327.00
Juki 6100 £190.00
Juki 6100 £295.00
Juki 6100 £485.00
Juki 6300 £740.00
Kaga 810 NLQ £220.00
Kaga 810 NLQ £364.00
Mannesmann M1009 + £197.00
MP1300 NLQ £218.00
Seikosha SCP 800 Colour Printe £185.00
Smith Corona Fastrix 80 £138.00
Smith Corona 3100 £170.00
Smith Corona LT1000 £230.00
Star SG10 £219.00
Shinwa CP80 £155.00
For range of Printer Leads PHONE

DISC DRIVES

Alpha Currency/KECM/Hi-tec PHONE

3½" DISC'S

For 3.5 MF130 DS from £2.45
For 3.5 MF200 DS from £3.15

PLEASE PHONE IF YOU CANNOT SEE THE PRODUCTS YOU NEED

All prices exclude carriage & VAT. We carry most leading format names. Please ring to check on stock prices. You won't find us cheapest but for more information on how to get our range of discount packs for the price of one please write to us on your business letterhead.

K.E.C.M.

(KNIGHT ELECTRONICS COMPUTERS & MUSIC)
8 WESTWOOD LANE WELLING KENT DA16 2NE TELE: 01 301 3745 (10am-10pm)
CALLERS BY PRIOR APPOINTMENT ONLY

TWO WAYS TO ENSURE YOU GET

ATARI USER

EVERY MONTH

1. Complete and mail subscription form on Page 61.
2. Hand this form to your newsagent.

Please reserve me a copy of Atari User magazine every month until further notice

☐ I will collect
☐ I would like it delivered to my home

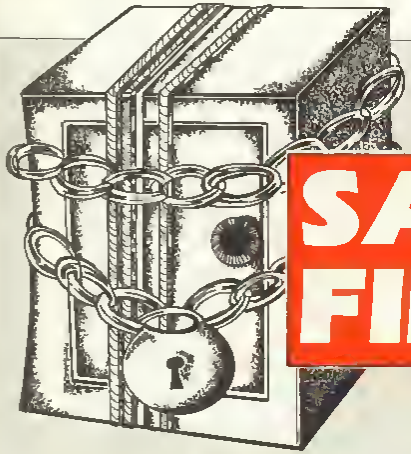
Name _____

Address _____

_____

_____

Note to newsagent: Atari User should be obtainable from your local wholesaler, or contact Steve Fletcher, Circulation Manager on 0252 27053



SAFETY FIRST

LEN GOLDING shows how to keep your precious data safe from Basic's ruthless memory management

THE Atari's most advanced features all involve storing lists of numbers in an area of memory which cannot be accidentally erased or over-written

Player missile graphics and redefined character sets require data tables. Custom graphics modes, DLIs and scrolling techniques need special display lists. Page flipping needs space for the extra screens. Vertical blank interrupt and other machine code routines require a safe environment to work in.

Basic does its own memory management which means that it will cheerfully wipe out anything beyond its ken. This article explains several techniques for making sure your safe areas stay that way.

First a quick review of how memory is organised when you switch on. Figure 1 is a simplified memory map which shows how the address space of a 48k machine looks

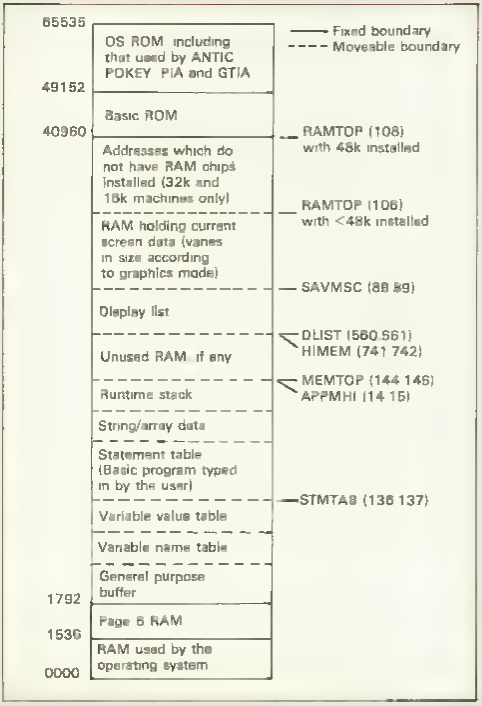


Figure 1 Simplified memory map

at power-up with a Basic program in place and no peripherals attached

The high end of memory from 40960 onwards is occupied by ROM while the first five pages of low memory – 0 to 1535 – are reserved for use by the operating system

A 256 byte data buffer starts at 1792 then Basic begins to build various tables which change size as programs are typed in

Your program itself is contained in a block called the statement table It starts immediately after the variable value table and grows upwards in a single continuous block moving up or down in memory as the tables below it expand or contract

Data for all the strings and arrays are placed at the end of the statement table followed by a small buffer used as a stack to serve FOR NEXT and GOSUB commands

The high end of user RAM contains current screen data and the display list This area grows downwards as graphics modes with higher RAM requirements are selected during program execution

Needless to say any foreign data in Basic's path gets wiped out

With everything moving around like this it would be very risky to put your precious data just anywhere Fortunately there's plenty you can do to keep things secure

A page of computer memory is 256 bytes long, so the sixth page of your computer's memory stretches from 1536 to 1791 This is supposed to be an automatically safe area since it is not used by the operating system and is below the address where Basic programs start

Unfortunately the first 128 bytes are used to hold the data overflow whenever an INPUT statement collects more than 128 characters

This does not happen very often but you need to watch out for the possibility and if necessary provide software protection The second half of page 6 is totally secure but of course is only 128 bytes long

Several regions are set aside automatically by the operating system for use when information is being transferred from one place to another

If no such transfers can occur during program execution it is possible to use these buffers as safe storage areas The two most valuable are the cassette buffer (1021–1151) and the printer buffer (960–999)

They are particularly useful for data or routines which are used only once at the very start of a program then discarded For example, machine code routines to initialise pointers or set up data tables or custom display lists for title pages

They can be used for longer term storage so long as your software seals off all access to the relevant devices for as long as the data need to be remembered

Basic keeps track of all its tables by using a system of pointers These are fixed memory locations which do not themselves contain raw data but instead hold an address where moveable data can currently be found

There is one to show where screen data start another pointing to the display list others to show where

"Basic keeps track of all its tables by using a system of pointers"

your Basic program and its various tables begin and end, and many more

Most pointers consist of two consecutive bytes The first contains the low byte of the address it points to the second the high byte

So to find the actual address you PEEK at both halves of the pointer multiply the second half by 256 and add it to the first For example locations 88 and 89 point to the start of your screen display data

SAVMSC = PEEK(88) + 256 * PEEK(89)

If you POKE any number from 0 to 255 into this address it will be printed as an Atascii character at top left of the screen If you select a different graphics mode the address contained in SAVMSC will change to point to the new start of screen data All the pointers work in this same general way

So although the various blocks of data set up by the OS must not be broken up in any way it is possible to shunt them around in memory by altering their respective pointers

The easiest pointer to change is RAMTOP (106) which tells the OS how many pages of memory are available If you subtract 1 from the number stored in RAMTOP then POKE it back in and execute a graphics command, the screen data and display list will move downwards by 256 bytes leaving this amount of spare RAM above it which Basic cannot see

You can save any multiple of 256 bytes in this way so long as the display list is not forced to descend below the address pointed to by APPMHI (14 15)

This method is quick simple and reliable and is commonly used in magazine listings but a quirk in the operating system reduces its appeal

Whenever you execute a graphics or a clear screen command the first 64 bytes above RAMTOP are wiped out Even worse scrolling a text window may erase up to 800 bytes in the supposedly safe area so watch out

Changing HIMEM (741,742) will let you reserve space just in front of the display list and ensures that Basic will give an error message if your program grows long enough to interfere

You must leave enough space to accommodate all the graphics modes your program uses otherwise screen data will descend during program execution and over-write your reserved area

Simply enter the mode which will take up most RAM and find the address contained in HIMEM This is the last safe address you can use Then work out how much memory you want to reserve calculate where you want the safe area to start and POKE this new address into HIMEM

One point to remember when changing either RAMTOP or HIMEM is that not all computers are 48k machines You cannot put a reserved area where no RAM is installed For this reason it's usual to make your program PEEK the pointer's initial value then subtract a fixed amount and POKE the new value back.

This means of course that the reserved area will occupy different locations in different machines so you can't specify absolute addresses within the safe area for Basic to PEEK and POKE Nor can you use this method to store non-relocatable machine code routines

But it is the easiest way of

ensuring that your reserved area starts on a 1k or 2k boundary so you can use it to protect PM data display lists character sets and the like

The bottom end of memory looks the same whatever your computer s memory size so if you reserve space by shunting MEMLO upwards you can predict precisely where the safe area will be

This opens up possibilities for absolute addressing and allows large amounts of non relocatable machine code to be stored Several peripheral devices which need special software to drive them say disc drives start off by booting a short machine code program to reset MEMLO then load their driver software into the reserved space

Unfortunately you can t simply write a Basic program to POKE a new address into MEMLO since this would in effect tell the computer that your Basic program itself had suddenly disappeared

If you want to alter MEMLO you really need to do it before your Basic program is loaded and this means a machine code subroutine

Another problem is that SYSTEM RESET will automatically set all pointers back to their default values This isn t a problem for those pointers which are reset within your Basic

Basic automatically ensures that strings do not overlap each other

program since they ll change back to the values you want every time the program is RUN

But for MEMLO the only solution is to trap the SYSTEM RESET routine which again needs machine code This is a bit beyond the scope of the present article but a suitable program is given in De Re Atari

The Atari can handle strings of any length up to its memory size There is plenty of scope for storing data tables and machine code routines so long as they are the kind that can sit anywhere in memory

Basic automatically ensures that strings do not overlap each other or any of the various tables and you can always find any string by using the ADR function

They can t be used to hold things like character sets, display lists and player missile data which need to start on 1k or 2k boundaries since strings move around in memory and you can never predict where they will finally settle

There are two common ways of getting data into a string – entering it from the keyboard in literal form or building it from READ and DATA statements The first is the easiest Simply translate your numerical data into Atascii symbols then type a program line with the symbols between double quotes

```
10 DIM A$(5):A$="(2<Pd"
```

This will store the numbers 40 50 60 80 and 100 in A$ There are two drawbacks to this technique

Firstly the length of a literal string is limited to what you can get on a single program line – about 108 bytes

Secondly some characters are hard to store in literal form the numbers 34 (double quotes) and 155 (end-of-line) need special attention along with all those numbers which translate into screen editing characters

The length problem can be overcome by concatenating several literal strings in the usual way

```
10 DIM A$(10),B$(5)
20 A$= "ABCDE" B$="FGHIJ"
30 A$(LEN(A$)+1)=B$
40 PRINT A$
```

By this method A$ can be made as long as you like it will still tuck itself safely away in memory with its first byte at ADR(A$)

Awkward characters are a bit more tedious to deal with Number 34 can be forced into a literal string after it has been typed

```
10 DIM A$(3) A$="X"Y"
A$(2,2)=CHR$(34). PRINT A$
```

Control characters such as 125 (clear screen) 28 (cursor up) and 253 (bell) can be forced into the string in the same way, but you won t be able to print them out unless you first disable the control functions by POKEing a non-zero number into address 766 CHR$(125) will then appear as the familiar bent arrow for example, instead of clearing the screen Use this to check that the string is correct then POKE 766 0 or press Break to restore the control functions

The only number that can never be printed as a screen character is 155 (end of line) If you must have this number in a string the only way to check it is by retrieving the string data in numeric form

```
10 FOR X=1 TO LEN(A$):PRINT
ASC(A$(X,X)) NEXT X
```

The beauty of literal strings is that they put data straight into memory without wasting time and space on a loading routine However typing long lines of apparently meaningless

Large data tables can leave the user hanging around for half a minute

symbols is not a job well suited for human operators and if as is very likely you make an error it can be very difficult to find

You can get round this problem by using a loader routine to build the string from scratch every time the program is run

```
10 DIM A$(6)
20 FOR X=1 TO 6
30 READ D A$(X,X)=CHR$(D)
40 NEXT X
50 DATA 35,36,37,35,35,40
```

You can store any number without difficulty in this way since you don t need to PRINT the characters on screen The main drawback is the time it takes to build the string

Long machine code routines or large data tables can leave your user hanging around for half a minute or more every time the program is run

You can sometimes get the best of both worlds by using a short utility program to build a string from READ and DATA statments then print it in literal form so that you can enter it as a program line Try adding to the program above

```
50 PRINT "100 A$=
";CHR$(34) A$;CHR$(34)
```

then RUN it The new line 100 is all you need to insert permanently in your program

You can put numbers directly into arrays and matrices without the

bother of converting to and from Atascii symbols and the entries can be changed easily without restoring to string manipulation techniques so it looks like an attractive option

The snag is that every number will be stored as a floating point decimal and use six bytes instead of the one required for an Atascii character Try to avoid this method unless it has special advantages in your particular situation

Basic ignores everything after a REM statement but will not overwrite it So if you store anything there it will normally be quite safe Data can be inserted as Atascii symbols immediately after the REM statement For example

10 REM a! @5%

will store the numbers 97 33 32 64 53 and 37 Note that any space other than the one immediately following REM is interpreted as the number 32 The problem now is finding where Basic will store it in memory This can be done only if the REM is at the very start of your program

STMTAB shows where the first line starts but there are five bytes to skip over before you get to the data (these hold the line number line length statement length and the token for REM) So your data start at PEEK(136) + 256*PEEK(137) + 5 You cannot store more than about 112 bytes in this way and the technique is relatively cumbersome

> **Once settled into a finished program REM will stay in the same place**

A REM statement will not occupy the same position in RAM for every program – that will depend on the size of the variable name and variable value tables But once settled into a finished program it will stay in the same place no matter what the host computer s memory size, which could be an advantage sometimes.

Finally we ought to consider the easiest option of all – leaving data in the unprotected area marked 'Free RAM' in Figure 1 This puts the onus on you the programmer to ensure that things don t overlap rather than leaving it all to the operating system

You have to work out the lowest address to which your screen data will descend during the program execution and the highest address of your finished Basic program Anything in between should be relatively safe

You can use this technique during program development especially if your machine has lots of spare memory, but it s better to choose one of the safer methods for the finished version

FILM CITY VIDEO

ATARI CENTRE
NOW OPEN

Games - Utilities - Productivity Software from all the best software houses.

ACTIVISION
ALPHA SYSTEMS
ANIROG
ARIOLASOFT
BATTERIES INC
BIG FIVE
BRODERBUND
DATABYTE
DATAMOST
DATASOFT
DIGITAL INT
ENGLISH
FIRST STAR
FUNSOFT
GREMLIN
IICD Inc
LEVEL 9
M M G
MELBOURNE HOUSE
MICROPROSE
MINDSCAPE
NOVAGEN
OSS
PRECISION
SIERRA
SSI
SUBLOGIC
TRONIX
U S GOLD
XLENT

To see the best range of software for your ATARI come and visit our store now OPEN 7 Days a week
2pm until 10pm
CALL us on ASHFORD (0) 48164
FREE CATALOGUE Send a stamp with your name and address Mail order available
FILM CITY VIDEO.
176 Chesterfield Road, Ashford, Middlesex.

MILES BETTER SOFTWARE
221 Cannock Road, Chadsmoor Cannock, Staffs WS11 2DD
Tel (05435) 3577

Bounty Bob	£(1) 95	Kung-Fu Master	£(8) 95
Manic Miner	£(1) 95	Mr Do	£(8) 95
Jet Set Willy	£(2) 95	Pole Position	£(8) 95
Jet Set Willy II	£(2) 95	Pooyan	£(8) 95
Jet Set Willy III	£(2) 95	Popeye	£(8) 95
Jet Set Willy IV	£(2) 95	Q*Bert	£(8) 95
Jet Set Willy V	£(2) 95	Qix	£(8) 95
Jet Set Willy VI	£(2) 95	Rescue on Fractalus	£(8) 95
Jet Set Willy VII	£(2) 95	Robotron	£(8) 95
Jet Set Willy VIII	£(2) 95	Sea Dragon	£(8) 95
Jet Set Willy IX	£(2) 95	Shamus	£(8) 95
Jet Set Willy X	£(2) 95	Spy Hunter	£(8) 95
Jet Set Willy XI	£(2) 95	Star Raiders	£(8) 95
Jet Set Willy XII	£(2) 95	Star Raiders II	£(8) 95
Jet Set Willy XIII	£(2) 95	Star Wars	£(8) 95
Jet Set Willy XIV	£(2) 95	Stargate	£(8) 95
Jet Set Willy XV	£(2) 95	Super Cobra	£(8) 95
Jet Set Willy XVI	£(2) 95	Super Zaxxon	£(8) 95
Jet Set Willy XVII	£(2) 95	Up 'n' Down	£(8) 95
Jet Set Willy XVIII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy XIX	£(2) 95	Zenji	£(8) 95
Jet Set Willy XX	£(2) 95	Zoom	£(8) 95
Jet Set Willy XXI	£(2) 95	Zorro	£(8) 95
Jet Set Willy XXII	£(2) 95	Zybex	£(8) 95
Jet Set Willy XXIII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy XXIV	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy XXV	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy XXVI	£(2) 95	Snowball	£(8) 95
Jet Set Willy XXVII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy XXVIII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy XXIX	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy XXX	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy XXXI	£(2) 95	Red Moon	£(8) 95
Jet Set Willy XXXII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy XXXIII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy XXXIV	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy XXXV	£(2) 95	Dropzone	£(8) 95
Jet Set Willy XXXVI	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy XXXVII	£(2) 95	Survivor	£(8) 95
Jet Set Willy XXXVIII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy XXXIX	£(2) 95	Track	£(8) 95
Jet Set Willy XL	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy XLI	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy XLII	£(2) 95	Zenji	£(8) 95
Jet Set Willy XLIII	£(2) 95	Zoom	£(8) 95
Jet Set Willy XLIV	£(2) 95	Zorro	£(8) 95
Jet Set Willy XLV	£(2) 95	Zybex	£(8) 95
Jet Set Willy XLVI	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy XLVII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy XLVIII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy XLIX	£(2) 95	Snowball	£(8) 95
Jet Set Willy L	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy LI	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy LII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy LIII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy LIV	£(2) 95	Red Moon	£(8) 95
Jet Set Willy LV	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy LVI	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy LVII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy LVIII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy LIX	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy LX	£(2) 95	Survivor	£(8) 95
Jet Set Willy LXI	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy LXII	£(2) 95	Track	£(8) 95
Jet Set Willy LXIII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy LXIV	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy LXV	£(2) 95	Zenji	£(8) 95
Jet Set Willy LXVI	£(2) 95	Zoom	£(8) 95
Jet Set Willy LXVII	£(2) 95	Zorro	£(8) 95
Jet Set Willy LXVIII	£(2) 95	Zybex	£(8) 95
Jet Set Willy LXIX	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy LXX	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy LXXI	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy LXXII	£(2) 95	Snowball	£(8) 95
Jet Set Willy LXXIII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy LXXIV	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy LXXV	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy LXXVI	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy LXXVII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy LXXVIII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy LXXIX	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy LXXX	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy LXXXI	£(2) 95	Dropzone	£(8) 95
Jet Set Willy LXXXII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy LXXXIII	£(2) 95	Survivor	£(8) 95
Jet Set Willy LXXXIV	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy LXXXV	£(2) 95	Track	£(8) 95
Jet Set Willy LXXXVI	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy LXXXVII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy LXXXVIII	£(2) 95	Zenji	£(8) 95
Jet Set Willy LXXXIX	£(2) 95	Zoom	£(8) 95
Jet Set Willy XC	£(2) 95	Zorro	£(8) 95
Jet Set Willy XCI	£(2) 95	Zybex	£(8) 95
Jet Set Willy XCII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy XCIII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy XCIV	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy XCV	£(2) 95	Snowball	£(8) 95
Jet Set Willy XCVI	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy XCVII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy XCVIII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy XCIX	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy C	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CI	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CIII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CIV	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CV	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CVI	£(2) 95	Survivor	£(8) 95
Jet Set Willy CVII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CVIII	£(2) 95	Track	£(8) 95
Jet Set Willy CIX	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CX	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CXI	£(2) 95	Zenji	£(8) 95
Jet Set Willy CXII	£(2) 95	Zoom	£(8) 95
Jet Set Willy CXIII	£(2) 95	Zorro	£(8) 95
Jet Set Willy CXIV	£(2) 95	Zybex	£(8) 95
Jet Set Willy CXV	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CXVI	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CXVII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CXVIII	£(2) 95	Snowball	£(8) 95
Jet Set Willy CXIX	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CXX	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CXXI	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CXXII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CXXIII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CXXIV	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CXXV	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CXXVI	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CXXVII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CXXVIII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CXXIX	£(2) 95	Survivor	£(8) 95
Jet Set Willy CXXX	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CXXXI	£(2) 95	Track	£(8) 95
Jet Set Willy CXXXII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CXXXIII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CXXXIV	£(2) 95	Zenji	£(8) 95
Jet Set Willy CXXXV	£(2) 95	Zoom	£(8) 95
Jet Set Willy CXXXVI	£(2) 95	Zorro	£(8) 95
Jet Set Willy CXXXVII	£(2) 95	Zybex	£(8) 95
Jet Set Willy CXXXVIII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CXXXIX	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CXL	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CXLI	£(2) 95	Snowball	£(8) 95
Jet Set Willy CXLII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CXLIII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CXLIV	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CXLV	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CXLVI	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CXLVII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CXLVIII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CXLIX	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CL	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CLI	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CLII	£(2) 95	Survivor	£(8) 95
Jet Set Willy CLIII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CLIV	£(2) 95	Track	£(8) 95
Jet Set Willy CLV	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CLVI	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CLVII	£(2) 95	Zenji	£(8) 95
Jet Set Willy CLVIII	£(2) 95	Zoom	£(8) 95
Jet Set Willy CLIX	£(2) 95	Zorro	£(8) 95
Jet Set Willy CLX	£(2) 95	Zybex	£(8) 95
Jet Set Willy CLXI	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CLXII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CLXIII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CLXIV	£(2) 95	Snowball	£(8) 95
Jet Set Willy CLXV	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CLXVI	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CLXVII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CLXVIII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CLXIX	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CLXX	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CLXXI	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CLXXII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CLXXIII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CLXXIV	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CLXXV	£(2) 95	Survivor	£(8) 95
Jet Set Willy CLXXVI	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CLXXVII	£(2) 95	Track	£(8) 95
Jet Set Willy CLXXVIII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CLXXIX	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CLXXX	£(2) 95	Zenji	£(8) 95
Jet Set Willy CLXXXI	£(2) 95	Zoom	£(8) 95
Jet Set Willy CLXXXII	£(2) 95	Zorro	£(8) 95
Jet Set Willy CLXXXIII	£(2) 95	Zybex	£(8) 95
Jet Set Willy CLXXXIV	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CLXXXV	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CLXXXVI	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CLXXXVII	£(2) 95	Snowball	£(8) 95
Jet Set Willy CLXXXVIII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CLXXXIX	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CXC	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CXCI	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CXCII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CXCIII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CXCIV	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CXCV	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CXCVI	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CXCVII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CXCVIII	£(2) 95	Survivor	£(8) 95
Jet Set Willy CXCIX	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CC	£(2) 95	Track	£(8) 95
Jet Set Willy CCI	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCIII	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCIV	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCV	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCVI	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCVII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCVIII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCIX	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCX	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCXI	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCXII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCXIII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCXIV	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCXV	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCXVI	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCXVII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCXVIII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCXIX	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCXX	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCXXI	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCXXII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCXXIII	£(2) 95	Track	£(8) 95
Jet Set Willy CCXXIV	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCXXV	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCXXVI	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCXXVII	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCXXVIII	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCXXIX	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCXXX	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCXXXI	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCXXXII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCXXXIII	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCXXXIV	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCXXXV	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCXXXVI	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCXXXVII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCXXXVIII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCXXXIX	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCXL	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCXLI	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCXLII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCXLIII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCXLIV	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCXLV	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCXLVI	£(2) 95	Track	£(8) 95
Jet Set Willy CCXLVII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCXLVIII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCXLIX	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCL	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCLI	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCLII	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCLIII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCLIV	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCLV	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCLVI	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCLVII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCLVIII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCLIX	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCLX	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCLXI	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCLXII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCLXIII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCLXIV	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCLXV	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCLXVI	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCLXVII	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCLXVIII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCLXIX	£(2) 95	Track	£(8) 95
Jet Set Willy CCLXX	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCLXXI	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCLXXII	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCLXXIII	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCLXXIV	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCLXXV	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCLXXVI	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCLXXVII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCLXXVIII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCLXXIX	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCLXXX	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCLXXXI	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCLXXXII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCLXXXIII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCLXXXIV	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCLXXXV	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCLXXXVI	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCLXXXVII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCLXXXVIII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCLXXXIX	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCXC	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCXCI	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCXCII	£(2) 95	Track	£(8) 95
Jet Set Willy CCXCIII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCXCIV	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCXCV	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCXCVI	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCXCVII	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCXCVIII	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCXCIX	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCC	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCCI	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCCII	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCCIII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCCIV	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCCV	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCCVI	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCCVII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCCVIII	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCCIX	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCCX	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCCXI	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCCXII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCCXIII	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCCXIV	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCCXV	£(2) 95	Track	£(8) 95
Jet Set Willy CCCXVI	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCCXVII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCCXVIII	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCCXIX	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCCXX	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCCXXI	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCCXXII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCCXXIII	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCCXXIV	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCCXXV	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCCXXVI	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCCXXVII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCCXXVIII	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCCXXIX	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCCXXX	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCCXXXI	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCCXXXII	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCCXXXIII	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCCXXXIV	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCCXXXV	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCCXXXVI	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCCXXXVII	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCCXXXVIII	£(2) 95	Track	£(8) 95
Jet Set Willy CCCXXXIX	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCCXL	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCCXLI	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCCXLII	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCCXLIII	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCCXLIV	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCCXLV	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCCXLVI	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCCXLVII	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCCXLVIII	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCCXLIX	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCCL	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCCLI	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCCLII	£(2) 95	Smash Hit 4	£(8) 95
Jet Set Willy CCCLIII	£(2) 95	Red Moon	£(8) 95
Jet Set Willy CCCLIV	£(2) 95	Star Wars 2001	£(8) 95
Jet Set Willy CCCLV	£(2) 95	Star Wars 2010	£(8) 95
Jet Set Willy CCCLVI	£(2) 95	Antarctic Mission	£(8) 95
Jet Set Willy CCCLVII	£(2) 95	Dropzone	£(8) 95
Jet Set Willy CCCLVIII	£(2) 95	Pyracurse	£(8) 95
Jet Set Willy CCCLIX	£(2) 95	Survivor	£(8) 95
Jet Set Willy CCCLX	£(2) 95	Time Pilot	£(8) 95
Jet Set Willy CCCLXI	£(2) 95	Track	£(8) 95
Jet Set Willy CCCLXII	£(2) 95	Wizard of Wor	£(8) 95
Jet Set Willy CCCLXIII	£(2) 95	Zaxxon	£(8) 95
Jet Set Willy CCCLXIV	£(2) 95	Zenji	£(8) 95
Jet Set Willy CCCLXV	£(2) 95	Zoom	£(8) 95
Jet Set Willy CCCLXVI	£(2) 95	Zorro	£(8) 95
Jet Set Willy CCCLXVII	£(2) 95	Zybex	£(8) 95
Jet Set Willy CCCLXVIII	£(2) 95	Return to Eden	£(8) 95
Jet Set Willy CCCLXIX	£(2) 95	Tanks of Time	£(8) 95
Jet Set Willy CCCLXX	£(2) 95	Emerald Isle	£(8) 95
Jet Set Willy CCCLXXI	£(2) 95	Snowball	£(8) 95
Jet Set Willy CCCLXXII	£(2) 95	Smash Hit 1	£(8) 95
Jet Set Willy CCCLXXIII	£(2) 95	Smash Hit 2	£(8) 95
Jet Set Willy CCCLXXIV	£(2) 95	Smash Hit 3	£(8) 95
Jet Set Willy CCCLXXV	£(2) 95	Smash Hit 4	£(8) 95
Jet Set

As more and more of you out there in Computer-User-Land have been buying Atari ST computers, the kind people at *Atari User* have decided to devote a special area of the magazine for your questions and problems whether software or hardware related.

Following my article on C and the ST in last month's issue, I have been put in charge of this new idea and been told to get on with it.

I hope to answer your queries and generally ease your problems, to the best of my ability. I'll also include a hint section, so if you have any that you'd like to pass on, please write to me at: Atari User, 88 Chester Road, Hazel Grove, Stockport SK7 5NY.

ANDREW BENNETT begins a regular column especially for users of the Ateri ST

Problems

Two monitors?

The first problem this month comes from L Groves of Swindon He bought a 520ST with black and white monitor and has recently added a colour monitor to his hardware collection

His question which will be repeated by every new owner of an ST – and was by myself – is whether it is possible to make a cable to connect both monitors at once

In theory this would mean that all three resolutions would be available on the Set Preferences menu and that a certain resolution would be displayed on the appropriate monitor Let me try to settle this issue once and for all.

If you have ever looked at the monitor socket on the ST you will see that it has an incredible 19 holes for the monitor cable s 19 pins

Some of these pins are for a colour monitor and some for a black and white one. Making a cable that somehow connects both monitors to their respective pins would be difficult but not impossible

Unfortunately the ST looks at a certain pin of the 19 called B&W Detect to see whether a black and white monitor is connected If it is it will ignore the colour monitor

You could overcome this problem with some simple electronics to make the ST think that the black and white monitor isn t connected – when in fact it is – and therefore make it able to use both monitors

The biggest problem with connec ting two monitors however is far more difficult to overcome Normally the first thing a program does is to look for which type of monitor is connected and then take the appro-priate action such as allowing more colours

The software will only look for one kind of monitor and will stop looking when it finds one. Therefore it will ignore the other monitor even though it is connected This problem will even occur with the desktop since it is just a very large example of a GEM program

The overall problem therefore lies not with the hardware which can handle two monitors but with the software which can t You could go halfway and connect both monitors by a special cable then turn one off and the other on when you wished to change resolution but the ST would almost certainly crash or lock-up when you did this and you would have to reboot the system

Printer problems

One problem that will crop up again and again with the ST is that of printer compatibility with both the ST and its software

A Poole of Gwynedd and Reg Williamson of Kidsgrove have both written to say that they are having problems with the free word-processor STWriter This is a stop-gap meant to provide users with something until Ateri releases the full GEM word processor in the near future

In the meantime however many of you have had problems using non Epson or Atari printers with STWriter

Two which seem to occur most often are printing certain characters – such as £ – and using the printer s special capabilities such as con-densed text

Although I use an Epson printer with my ST I believe the solution to the first of these problems is to include in your text a Control O followed by the PRINTER code for the required character

You may also need to send a Control-O sequence to change character sets beforehand

The second problem can be solved by altering the file called XYZZX TXT on your STWriter disc Make a copy of the file on to another disc first and then load it into STWriter The explanations following the *s are simply comment lines and tell you what immediately follows

The necessary codes that must be sent to the printer to turn on the required mode then follow – a code for each line followed by a Return

If you change the required codes and then save the file as you would normally you should be able to use all of the features of your printer If your printer has a certain feature that the Epson printers don t have then you can replace one of the Epson code sets with one of your own

For example if your printer can change colour but doesn t have the Pica character size then you can replace the codes for Enter Pica and Exit Pica to the codes for Enter Red and Exit Red You would then use the Control codes for Pica in your files but now they will change the print-out colour

Hint section

If you have been opening and closing directories to find a particular program, you may like to know that you don t have to close the directory window every time you change discs

First open a directory window as normal Next change the disc in the drive and then press Esc once The new directory will now be read in and will replace the old one on the screen

End Bit

That s it for this month Don t forget If you ve a question you d like answered or you have a hint that you ve discovered after many hours at the keyboard then write to me at *Ateri User*

I also want to hear about the kind of ST articles you d like to see in the future and what languages and other software and hardware you own

● *Keep the questions rolling and I ll see you next month*

WOOTTON COMPUTERS

PHONE FOR THE WEEK'S SPECIAL OFFERS!!

PHONE FOR THE WEEK'S SPECIAL OFFERS !

ALL $1 BUSINESS GAMES SOFTWARE AND UTILITIES NOW AVAILABLE AT THE LOWEST PRICES

HOME HARDWARE

MICROPERIPHERALS

SPECIALIST SOFTWARE PRICES

Cartridges

Cassettes

EDUCATIONAL/PRODUCTIVITY

HOME HARDWARE

SOFTWARE

SPORTS

115 EDLESTON ROAD, CREWE,
CHESHIRE 0270 214119

STRATEGIC PLUS SOFTWARE

SPECIALISTS IN QUALITY COMPUTER GAMES FOR THE DISCERNING GAMER

STRATEGY ADVENTURE AND SPORTS GAMES FOR THE ATARI 800 SERIES AND ATARI 520ST COMPUTERS

Send for our free 20 page A5 size catalogue which has a large selection of titles, with descriptions and complete ordering information for each game.

All gamers who place orders in receive our catalogue will be sent details for our quarterly newsletter updating our catalogue and keeping you in touch with up and coming titles.

NEW TITLES COMING SOON

ATARI 800 Series Star Fleet – Solo simulation playing game
ATARI 520ST Flight Simulator II Jet Sundog Phantasie Universe II

STRATEGY WARGAMES

Call or write to
Strategic Plus
Cassandra Pell Bus Ctr
Hampton, Middlesex
TW12 3RA

Business Hours
10am 1pm Mon-Fri.
11am 4pm Sat

Please make cheques payable to **Strategic Plus Software**

All Programs are on Disk only

All games include Postage and Packing VAT

ATARI AT HOMEVIEW VIDEO

ATARI 400, 800, 600XL, 800XL, 130XE, 520ST

(Callers Welcome)

SOFTWARE

	Cass	Disk
Drag Zone	£9.50	£13.95
Colossus Chess	£9.50	£12.50
Buccaneer	£9.50	£14.50*
F15 Strike Eagle	£14.50	£14.50
Blue Max 2001	£9.50*	£14.50
New York City	£9.50*	£14.50*
Ghosthunter II	*	£14.50
Cannon	N/A	£10.50
Mr Robot	N/A	£14.50
Mr Do	£9.50	*
Bounty Bob Strikes Back	£9.50	*
International Karate	£9.50	N/A
The GT American Road Race	N/A	£14.50
Chop Suey	£9.50	£12.50
Super Zaxxon	£9.50	£14.50
Rescue on Fractalus	£9.50	£14.50
Hacker	£9.50	£14.50
Ballblazer	£9.50	£14.50
Seven Cities of Gold	£9.50	£14.50
Music Construction Set	N/A	£14.50
Pinball Construction Set	N/A	£14.50
Ultima III	N/A	£19.50
Hulk	N/A	£15.50
Spiderman	N/A	£15.50
Mercenary	£9.50	£12.50
Koronis Rift (Release 22nd Dec)	Phone	Phone
Eidolon (Coming soon)	Phone	Phone
D Bug	*	£12.50
Elektra Glide	£9.50	£12.50
Syntois	N/A	£49.95
Dynacalc	N/A	£49.95

We cannot list all the items we stock

Pop Mime 2048bc Ok's Well Decathlon Pinball H Space Shuttle Tennis, B.C.'s Quest for Tires Deaths Bruce Lee Pole Position Four Apocalypse, Sent Right Bootie Bush etc
Coming soon
Also writer Quark coming soon 1000's more titles available

Dealer for COMPUTER SUPPORT

XDR	Phone for details
XDC 80 Column	Phone for details
XDC Lit mate	Phone for details
Triples Board for selecting different operating systems	Phone for details

Blank Discs £12.95 for 10
Hub Rings Guaranteed notched for trouble free use
DOS 2.5 Send Disk + 50p for FREE COPY

AUTO LABELLER FOR EPSON PRINTER

For DOS 2.5 3 Long John DOS Multi Font etc. Plus new Long labeller page £9.95

HARDWARE

Touch Tablet	£21.00 + P&P
130XE	£125.00
130 XE Starter Pack	£149.00
130XE + Disk/D Starter Pack	Phone for details
1Mbyte Disk Drive	£125.00
520 ST in 3 new packs	Phone for details of bank prices

PRINTERS, INTERFACES ETC ENQUIRIES WELCOME

CALL IN OR PHONE WITH ANY PROBLEMS
PROBLEMS FOR FRIENDLY ADVICE REGARDLESS OF WHERE PURCHASED

PHONE ORDERS SENT SAME DAY OPEN 7 DAYS A WEEK –
Mon, Tues, Wed Fri and Sat Open till 6.00pm
24 HOUR ANSWER SERVICE

Prices inclusive VAT and FREE P&P Overseas orders welcome

Call for Best Prices
CREDIT CARD HOT LINE
01-691 0207

RING **HOMEVIEW** NOW
296 BROCKLEY RD BROCKLEY, LONDON SE4 2RA

TIME 02:45.30 PM

Make time for a time check

By PAUL LAY

THIS program provides an interrupt driven 12 hour clock which will appear in graphics Mode 0 at the top right hand corner of the display.

In other modes it will be displayed at the top right hand corner of the text window if one is present.

The clock is constantly displayed but will be momentarily destroyed – for 1/50th of a second – by any screen scrolling. It is protected against the system reset key but pressing this key results in the loss of a second or so.

It is possible to turn the clock display off by POKEing a zero to location 1789 and it can be turned back on by POKEing any other value.

Once the clock has been set it can be reset by running this program again and the user may continue normally. The only point to watch is that page 6 is not used as the clock routine is stored here.

VARIABLES

TEXT$	Indicates AM or PM
CHECKSUM	Validation check on machine code data
LOCATION	Loop over locations used by machine code
CODE	One item of machine code
HOURS	Hours
MINS	Minutes
SECS	Seconds
HI	First digit of hours, mins/secs
LO	Second digit of hours, mins/secs

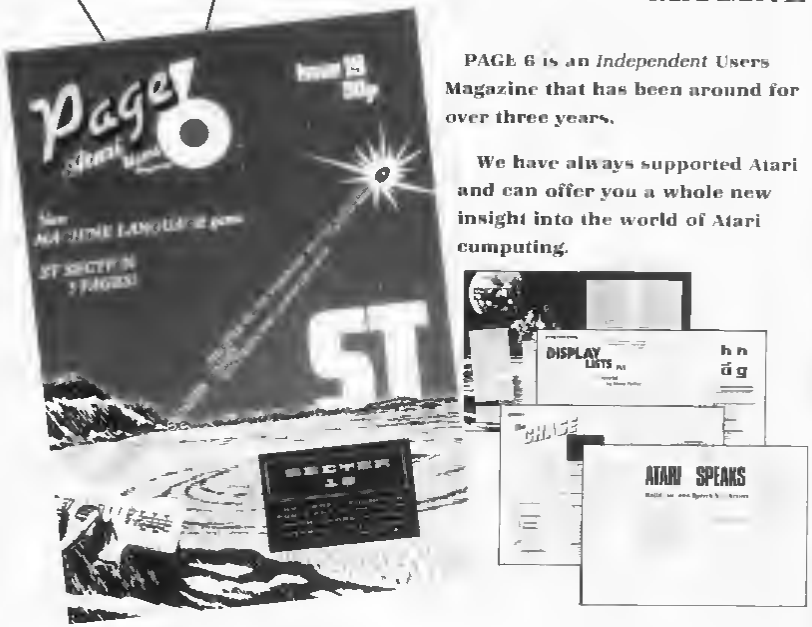
```
10 REM Atari 801 Driven Clock
20 REM for Atari User Magazine
30 GRAPHICS 0
40 DIM TEXT$(2)
50 ? :? "Atari 801 Driven Clock"
60 ? "by Paul Lay"
70 IF PEEK(1530)=32 AND PEEK(1654)=201
 THEN 230
80 REM ---set up machine code --
90 CHECKSUM=0
100 FOR LOCATION=1536 TO 1703
110 READ CODE
120 POKE LOCATION,CODE
130 CHECKSUM=CHECKSUM+CODE
140 NEXT LOCATION
150 IF CHECKSUM<>20816 THEN 190
160 ? :? "Error in data statements :"
170 LIST 530,880,580
180 REM ---mask System Reset key ---
190 IF PEEK(5)=1 THEN 200
200 POKE 2,5
210 POKE 3,0
220 POKE 5,7
230 GOTO 250
240 POKE 1537,PEEK(112)
250 POKE 1538,PEEK(113)
260 POKE 12,0
270 POKE 67,0
280 REM ---input the time---
290 ? :? "Enter the time :"!?
300 ? "Hours (1-12) ";
310 TRAP 330:INPUT HOURS
320 IF HOURS<1 OR HOURS>12 THEN 300
330 ? "Minutes (0-59) ";
340 TRAP 330:INPUT MINS
350 IF MINS<0 OR MINS>59 THEN 330
360 ? "Seconds (0-59) ";
370 TRAP 380:INPUT SECS
380 IF SECS<0 OR SECS>59 THEN 360
390 ? "AM or PM ";
400 TRAP 390:INPUT TEXT$
410 IF  NOT (TEXT$="AM" OR TEXT$="PM")
 THEN 390
420 REM ---set the clock---
430 HI=INT(HOURS/10):LO=HOURS-10*HI
440 POKE 1700,LO+144 POKE 1701,HI+144
450 HI=INT(MINS/10):LO=MINS-10*HI
460 POKE 1777,LO+144:POKE 1778,HI+144
470 HI=INT(SECS/10):LO=SECS-10*HI
480 POKE 1774,LO+144 POKE 1775,HI+144
490 POKE 1789,OSC(TEXT$)+90
500 X=USR(1536)
510 END
580 REM ---machine code data---
590 DATA 32,255,255,72,104,173,148
600 DATA 2,133,203,173,149,2,133
610 DATA 204,160,176,202,6,409,0
620 DATA 32,92,220,96,162,104,238
630 DATA 215,0,238,238,6,177,238
640 DATA 0,201,164,208,9F,142,215
650 DATA 6,210,216,6,173,215,6
660 DATA 201,154,238,79,142,215,6
670 DATA 238,238,6,173,238,0,201
680 DATA 154,229,60,142,238,6,228
690 DATA 215,6,173,229,6,201,150
700 DATA 208,51,142,233,6,238,201
710 DATA 6,173,241,6,201,104,208
720 DATA 40,142,241,6,238,242,6
730 DATA 173,242,6,201,150,208,27
740 DATA 142,242,6,238,246,6,173
750 DATA 244,6,201,154,208,6,142
760 DATA 244,0 238,245,0,201,148
770 DATA 240,5,201,167,240,27,96
780 DATA 173,243,6,201,165,238,240
790 DATA 173,233,6,201,164,249,6
800 DATA 169,161,141,233,6,96,169
810 DATA 176,141,233,6,96,173,245
820 DATA 0,201 145,208,222,102,244
830 DATA 6,229,240,8,142,245,6
840 DATA 96,32,26,6,173,253,6
850 DATA 240,42,173,151,2,801,24
860 DATA 240,11,138,201,117,889,160
870 DATA 234,133,206,78,216,0,160
880 DATA 87,208,21,165,20,133,239
890 DATA 160,89,433,208,101,22,160
900 DATA 17,109,230,0,145,805,200
910 DATA 202,10,247,76,56,208,0
920 DATA 128,173,161,128,148,148,142
930 DATA 144,144,142,144,148,150,145
940 DATA 145,128,128,237,233,600,220
950 DATA 0,1
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	0557	20	6682	30	2013
40	2120	50	6799	60	1705
70	7722	80	0387	90	2150
100	4670	110	2023	120	1751
130	4576	140	2560	150	4699
160	0720	170	1425	180	7745
190	3621	200	1550	210	1556
220	1552	230	1537	240	3356
250	2260	260	1720	270	1302
280	5205	290	5907	300	3219
310	4261	320	5890	330	3701
340	4236	350	5344	360	1740
370	0201	380	5660	390	2505
400	4137	410	7571	420	5560
430	5119	440	5952	450	5000
460	5536	470	5705	480	5525
490	4277	500	2027	510	815
520	6019	530	4729	540	6455
550	4440	560	4794	570	6519
580	6726	590	4189	600	6728
610	6500	620	4765	630	6405
640	6759	650	4584	660	6349
670	6603	680	4400	690	6456
700	6691	710	6464	720	6752
730	6626	740	6728	750	6732
760	6742	770	6166	780	6820
790	6451	800	6812	810	6725
820	6729	830	6772	840	6697
850	6166	860	4999	870	5007
880	3027	890	1460		

Come and see us at
THE ATARI COMPUTER SHOW
Novotel Hotel London
7th to the 9th of March
Stand 32

THERE IS MORE SUPPORT
FOR ATARI
THAN YOU MIGHT IMAGINE



PAGE 6 is an *Independent* Users Magazine that has been around for over three years.

We have always supported Atari and can offer you a whole new insight into the world of Atari computing.

For an annual subscription of only £7.00 we can offer you

- Top quality bi-monthly magazine
- Books at special prices
- A huge library of public domain programmes
- Advice and help

We support 400/800 XL XE and ST machines'

Subscription £7.00
(Europe £10.50 elsewhere £16.00)
Send to:
PAGE 6
PO BOX 54
STAFFORD
ST16 1OR

Tel: 0785 41153

Send £1.00 for a sample copy

Let's GET it right, VAL is not guilty

I NOTE that in Mike Rowe's documentation for his Computer Countdown program in the December 1985 issue of Atari User he reports that he found a bug while using his version A Basic cartridge which he attributes to the VAL() function which apparently does not operate correctly after using it once"

I would like to clarify the actual cause of this problem The VAL function is not at fault

The culprit is in fact the GET command Bill Wilkinson of Optimized Systems Software identifies the problem in 'The Atari Basic Source Book' from Compute! Publications

The GET statement does not reinitialise its buffer pointer resulting in corruption if used after a statment which has changed the system buffer pointer

In Mike's program the subroutine at line 300 contains a GET (at line 310) followed by a VAL (at line 340)

The first time through there's no problem, the buffer pointer has not been changed prior to the GET, it changes when the VAL is first executed

However on subsequent calls to the routine GET will not reinitialise the buffer pointer and the result is that VAL apparently corrupts the input

Mr Wilkinson suggests a simple solution of using a statement such as DUMMY$=STR$(0) or PRINTing any number before executing the GET

Either of these statements correctly resets the buffer pointer Another solution is to use the statement X=USR (ADR(hLOZ)) (Z is INVERSE) which effectively JSRs to the buffer initialising routine in the floating point ROM package which GET omits

Incidentally LOCATE has similar problems as the statement calls GET

The bug was present in Atari Basic Rev A (the original cartridge) but was corrected in the later B and C revisions

The version of Basic can be determined by PEEKing location 43234 Rev A gives 162 Rev B gives 96 and Rev C gives 234

One last comment on Atari Basic I presume all these 800XLs which are currently being offered in bargain packages contain the Rev B Basic with its built-in bugs (the infamous 16 byte addition to each SAVE)

I hope Atari or someone is notifying purchasers of these XLs that the bugs exist and ways around them

It's all well and good to grab a larger slice of the market but not if you end up with a number of complaints about the product

If the Rev B problem and its solutions is not clearly identified then the Hotline and shops are going to get plenty of questions

I wonder how many people in Boots Laskys and Dixons can explain the situation?

Finally congratulations on the continued publication of Atari User I look forward to new series replacing the concluding graphics and display list articles

Would it be possible to print a regular comprehensive user group listing?

Mentions of one or two groups have been made in the Mailbag but I'm sure it would be beneficial for all Atarians to see a detailed list

I'm certain there are many who are looking for local groups and would welcome such a page – **Allan J. Palmer, Basingstoke**

● Thanks for the information on the GET command

We hope to publish a comprehensive list of user groups in the future

Your fears about the Basic included in the bargain 800XLs may or may not be well founded we can't say at the moment.

Certainly some recently acquired 800XLs in our office all arrived with Rev C Basic so let's hope the bargain machines are similar

The Bells

I GIVE up! I thought I knew my 800XL keyboard but try as I may I can't produce the special character on line 9702 of your Esmeralda game in the January issue

Just what is that last item of data? It's certainly given me the hump! – **Greg Sexton, Crawley, Sussex**

● The offending character should be a 4 and once again we plead innocence The original artwork was perfect (of course) and the glitch occurred in the printing process

We're mixing the sand and cement for the printer's overcoat at this very minute but apologies to all frustrated bell ringers

Loading technique

I RECENTLY bought an Atari 800XL with a recorder and quite a number of tapes and software

From the beginning I had trouble loading most of my programs and thinking my recorder was at fault I took it back to the shop and had it replaced

I still find that I cannot load any cassette no matter how closely I follow the instructions given in the Atari manual or those given with any individual cassette

I can't understand this, as I

Limited on-screen editing

I WOULD like to see something more educational for my children in Atari User, also ideas on putting and getting characters on graphics screens

In the December 1985 issue, you talked about the infamous meth lock-up Well being a sufferer of this problem for about 11 months I was concerned about the guarantee running out on my 800XL so I telephoned the Atari dealer in SE England who sold it to me

I was told that this problem occurred if one did too much on-screen editing

I read the article from your magazine but no offer was made to change anything

I was told it was a design fault and that it was difficult to cure I would have to live with it.

As I try to write a lot of programs and invariably get them wrong I do a lot of on-screen editing I therefore felt this was not a very satisfactory answer

I decided to telephone the Atari Help line They confirmed that there was a problem but again no offer was made to change anything

What they did offer was that if I sent a disc or cassette to them they would put on it for me Basic Revision C software which would help solve the problem

They did also mention an alternative answer – the purchase of Basic XL which would also solve the problem – **R.J. Hodgkins, Gillingham**

now have a new recorder and I don't think my computer is at fault as I have carried out all the audio and visual tests and everything appears to be in perfect working order

Every cassette I load gets as far as the 'ready' stage but as soon as I press play on my recorder and Return on my computer I get BOOT ERROR and MEMORY TEST on the screen

This happens with every one of my numerous cassettes and I am just about ready to smash the lot against the wall I hope you can help me – **Patrick McDonald, Lisburn, Co Antrim**

● It sounds as though you are trying to load commercial tapes many of which require Basic to be locked out

Although the loading instructions may tell you to hold down START when you switch on the machine with an 800XL you often need to hold down START and OPTION Try this with a few tapes – it may save you having to re-paper the wall!

Getting in touch

CONGRATULATIONS on your magazine particularly the beginners section

I recently bought an 800XL and disc drive and I appreciate the monthly disc

My first attempt at typing in a long program Maze Munch took nearly six weeks to debug (all my own typing errors)

I would be very interested if you could publish addresses of user groups as although I sent off my guarantee registration cards I have heard nothing from Atari which I gather is not unusual

I would really like to contact a group and particularly other users in the North Gwent area

With regard to Dean Rossiter's letter in November and your comments on writing an article on plugging the Atari into the outside world Yes yes yes please! – **Ian McNicholas, Ebbw Vale**

● We don't know of a user group in the North Gwent area – perhaps one of our readers knows of one

Reason for the error

I TYPED in the program Canvas on my Atari 800XL from your October magazine

When I tried to run the program it went to the graphic screen and printed 'Error 9' at line 2070

Please can you tell me what is wrong with the program? – **Robert Harvey, Cowplain, Hants**

● Guess what – you've made a typing error somewhere probably between lines 2070 and 2120

Books for beginners

I WOULD like to know if Ocean are thinking of bringing out Street Hawk and DT Supertest also could you recommend a good book for the beginner?

Could you please tell me if my 800XL is OK? After I have saved a program a high pitched tone keeps going until I reset or press END – **M Fryer, Wednesfield**

★ ★ ★

COULD you give me the title of a book on how to use Atari Basic from the start or where to get tuition on the subject

I was not able to get to grips with the Atari manual and subsequently I have not been able to use my micro to best effect

Could you tell me if Zoomsoft supply the software with Touch Tablet as it does not say anything about it in the advert in Atari User – **Alen McGill, Maidstone.**

● There is no problem if a machine comes on the high pitched tone after saving Just hit Reset or type END – or use a SOUND statement – and it will go away

The Touch Tablet comes as standard with the Atari Artist cartridge allowing you to use it to the full

If you bought the package with the 1020 printer you also get a program which will allow you to get a paper print out of your masterpieces in four colours

This package has only recently become available again and is excellent value for money

There have been a number of requests for good books for starting to program on Atari computers possibly because of the poor manuals sent out with the XL range

There are dozens of books available but you could do a lot worse than looking out the following titles

The XL Handbook (Century Publications) £6.95 A good book to take you from first steps up to some quite advanced topics

Easy Programming for the Atari Micros (Shiva) £6.95 A similar book to the above but covering less ground when it comes to the more advanced sections

Your Atari Computer (Osborne/McGraw Hill) £16.95 A superb book for someone who has perhaps mastered the very first steps and wants an excellent tutorial/reference book with lots of information on all aspects of Atari programming A must for the serious programmer

Watsons Notes on the Atari (Glentop Publishers) £2.95 each A series of six very reasonably priced books starting from first steps and moving eventually up to player/missile graphics etc

The full range consists of
1) First steps in Basic
2) Exploring Basic
3) Making Basic work
4) Creative graphics
5) Advanced programming
6) Journey into memory

However if YOU have seen or purchased a book which you think other readers would find useful why not write in and let everyone know about it

The same applies of course if you found that a book didn't help you with what you thought it would

Hunting tigers

I WRITE in response to the letter published in the December issue from C R J Sunman regarding Tigers in the Snow

My local Atari dealer Ordem has this title for £14.95, that's the same price as the C64 and some £25 cheaper than Mr (or is it Ms) Sunman talked about

I bought a copy myself and am very pleased with this excellent strategy game – Apple version one side of disc Atari version the other – **Mrs L. Prestidge, Reading**

● The game also appears in the latest Silica Shop list as a US Gold release at £14.95 for cassette or disc

Basic experience

I WAS sorry to hear that some of your more experienced readers objected to space being used for beginners

Well, I'd just like to say we're not all budding geniuses and being an ignorant housewife I find it very beneficial

Also my children who are four and five years old can learn to type in with these Basic small programs

In fact they are very good now with all the keys of the keyboard and are enjoying doing these short lists

So give a thought for the future generations of computer users – **Euphemie Hain, Livingston.**

● Don't worry we intend to continue catering for as wide a range of users as possible

Hard on gerbils

IN the August 1985 issue of Atari User *there was an article concerning the Ocean game Frankie Goes to Hollywood, which told us how great the game was going to be when it was released in late summer*

Well summer has come and gone – I think – and the game hasn't made an appearance in Atari format anywhere Although it's been out in other formats for ages

Where is it? I want to buy it I've played the Commodore

version and it's great. Even the Spectrum version is very good.

Considering the Atari's superiority over these two machines its version should be a real cracker.

Another much advertised game which has not yet appeared in Atari format is System 3's International Karate which according to the first adverts was supposed to be released in mid-August I don't see it anywhere do you?

If you don't tell me where it is I'll eat my gerbils – **A Veryannoyedparson, Newcastle.**

● Our advice is to sauté them lightly and serve in a white wine sauce.

Bridging the gap

I KNOW not where or to whom I should write to express my disappointment.

Last April I purchased a 130XE with the assurance that software for bridge was available. This has never been forthcoming.

Why do I see many games which I am sure can not be big sellers whereas bridge is one of the most popular games in the country with far more participants than chess.

Many hotels hold bridge weekends throughout the year. Evening classes certainly in my area are over-subscribed.

Even the BBC has produced its own £200 computer devoted to the game.

I would be grateful if you could help me with the right contacts – **A O Formay, Orpington.**

● We don't know of a commercially produced package but turn to Page 32 for the *Atari User* Bridge program.

Canadian contact

BEING a native of England and an imigrant to Canada for 13 years I was most pleased to receive my first issue of

All in the same boat...

WE were interested to read G Whittaker's letter in the September issue of Atari User about the difficulties he is having with his Atari.

We were unable to get our Atari to work correctly when the memory module was attached yet the computer worked perfectly well on its own.

As the memory was under guarantee we sent it to Slough for attention and it was sent back to us after checking.

Still the two would not work correctly together, so we sent it all to the recommended Atari repairers Mastercare of Maidstone who returned it saying all was in order. But on trying it we not only found it still had the original faults but quite a few more as well!

We sent it back immediately but since then have been told each time we enquire that they have not been able to get the parts. Surely if the computers are still being made somebody somewhere must have parts.

Is it wrong to presume that the recommended repairers can mend a computer and not make more faults – five months seems to me an exceptionally long time and then to tell the customer to be patient or take it elsewhere for repair after their mechanics have louted it up! – **Mrs A O. Iles, Ashford.**

★★★

ON reading G Whittaker's letter, I feel I must agree with him. I own a 800XL 1020 printer 1100 recorder and touch tablet. Just recently I bought a 1050 disc drive.

On getting my newly acquired 1050 home imagine my horror on opening it up to find the 1050 leads and transformer there and that was all.

I went back to Laskys who said that there should be manuals and a DOS disc. I asked if they could take them from another box but in each one opened the instructions were in German.

They suggested I write to Atari at Slough which I have now done three times and each time as in Mr Whittaker's case silence or plain ignorance.

I think before Jack Tramiel boasts about backing all existing ranges and new launches and the like he should put his UK house in order.

I have been so disappointed over this that I have convinced the 17 members of our local user group that if things don't pick up with Atari we had better consider going over to Commodore as a last resort.

Over the years I have grown to love Atari but recent events are making it hard for me to get excited about Atari's future prospects – **J B Gray, London W19.**

★★★

YOU are right G Whittaker of Swinton you are not the only one with difficulties with Atari UK.

Some time ago I sent a letter about vertical lines covering the screen display of my 130XE asking whether it was my machine at fault or whether it isn't compatible with my Philips TV – and I'm still waiting to see if it can be fixed – **A Boxward, Worcester.**

★★★

I WAS not surprised to read of D Whittaker's account of his dealings with Atari UK. There must be dozens of people in the same boat.

I am a midwifery tutor and as yet in all but one or two schools computers do not feature in our educational techniques.

However tutors all over the country are very keen to know how and where computers could be put to good use in midwifery and nursing education.

Being an Atari owner and battling with Basic at present so that I can write my own programs for our student midwives I read with interest in your magazine that Atari are offering a discount on their hardware to educational establishments.

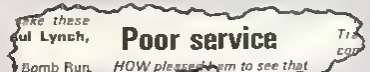
I believe that Atari without the discount offers good value for money therefore being a good samaritan I wrote to Atari UK and informed them of this very large virgin territory in midwifery and nursing schools.

Companies selling the BBC B already know that they have a large untapped pool of budget holders and I know of at least two firms who are trying to make inroads into this market in my area alone.

We have regular regional meetings where an Atari representative could have demonstrated the computer's uses to about a dozen budget holders at once.

Did they acknowledge my concern for them? No fear I have not as yet so much as received a reply. In fact the sheer rudeness caused me to invite a firm selling the BBC B to come to our school and demonstrate that computer's potential.

When a few schools purchase computers the others will follow suit and probably with the same make so that there can be interchange of software. So Atari beware there is a section of the market that you are ignoring at your cost. Computers are bound to mushroom into offices and ward areas in hospitals throughout the country. The hospital classroom is one foot in the door – **Mrs Jackie Paddison, Eggborough, Goole.**



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

Atari User compliments of my English relatives

I must say first and foremost well done on a fine magazine I was most impressed with the layout Your articles make excellent reading also your type-in programs are unique which brings me to the reason for writing this letter

I am a member of MACE (Michigan Atari Computer Enthusiasts) group I am also the disc librarian and program coordinator for my local Atari group ERACE (Essex Regional Atari Computer Enthusiasts)

I would like to correspond with any Atari user group in the UK or individual who would like to exchange ideas and public domain programs with our group

At present our membership is around 150 and growing, our library consists of approximately 50 discs all public domain and 100 MACE discs

We would also like to trade new and interesting programs for the 520ST public domain

Anyone or group can write to us care of myself at the address below – **Herold Warne, 2630 Reddock Avenue, Windsor, Ontario, Canada, N9E 4J4**

Taming the printer

MY 1020 printer will print standard upper and lower case from a command from Atari Writer and Home Filing Manager

But I cannot access the character widths set character, etc as described in the manual

Please what am I doing wrong? My age is 65 (old codger) I do know a younger man (30ish) who sells TVs and micros and he is having the same problem

A second problem We are encouraged to make a working disc of DOS but when I tried to make a working copy of my Home Filing Manager I cannot

I get Format incompatible using DOS 2 or 3 However using Atari Writer I have been able to list and print the files but giving 000 sectors used and 000 unused

EMI programs Billiards Cribbage etc made for the 400 and 800 models, when loading into XL models they stop after loading the first part

What happens is the first part loads then the TV screen flashes and then crashes To overcome this as soon as the TV flashes press Reset then the program continues to load normally I discovered this by experimenting

I am now converting my daughter to Atari and she is putting her Sinclair Spectrum (cannot get on with it) up for sale – **S C Jones, Gillingham**

● You might find that the problem is one of shifting between modes If you check the 1020 manual you will find the best way to access the extra modes is to go into Graphics Mode (ESC ESC Ctrl G) then change the size etc by following the manual and try a sample by sending a line such as

```
P (Text goes here - )
```

The P tells the Graphics Mode that some text to print follows not more Graphic commands Afterwards you can quit Graphics Mode by using command A and send normal text again

By the way don t forget that your commands must be the first thing on a line they cannot come after some text

Most commercial discs are protected against home copying to avoid the potential problem of piracy

However unless badly treated a disc should last an awfully long time so you shouldn t really need to copy it

If your disc does go faulty your dealer should be able to replace it very quickly

Good luck with converting the rest of your family to Atari! It s nice to find we have such a wide age range in our readership

Mystery command

I BOUGHT an Atari 800XL a year ago last December and on looking at some coloured pamphlets pretending to be instructions was disappointed at the feeble effort which Atari had put into explaining their machine

I hoped that the computer would not be so useless, and luckily it was not.

I have now figured out how most of the main commands work but there are still some lesser known ones which I have never seen before

A fellow Atari user mentioned the XIO command He said it was used to fill shapes in but neither he nor I know how it works how to use it or even if there is such a command I hope you can help – **C Macdonald, Paisley**

● Yes there is an XIO command It s a general input/output command which can be used to fill an area of the screen between plotted points and lines

A typical example might be

```
XIO 18,#6,0,0,"S:"
```

The 18 is the part which is needed for a fill operation – replace this with 12 and it performs a CLOSE operation instead

For an example of its use see the Microscope program on page 50 of our November issue

Directory reader

ATARI USER along with other magazines often reminds us and quite rightly that when writing to advertisers for information about their products we should enclose an SAE if we want a reply

I wonder if you could remind advertisers that if they are sent an SAE then a reply is expected

If they don t reply they can be sure that they have lost a sale, as there are only two reasons for not replying – they are no longer trading or they are not interested in selling their products, which is strange if they are paying for adverts in magazines

On a more constructive note, the DOS directory reader, December Mailbag can be performed much quicker by typing in direct mode

```
OPEN #1:4:"D:*.*"
TO #6:PRINT #1;A$:?
```

This can be done at any time without affecting the program in the machine The directory list will end with an Error 136 (end of file) which can be ignored

If you have already used A$ in your program you will get Error 9 so leave out the DIM or do a CLR first – **P Goulter, Twickenham**

Auto-boot tapes

I STARTED to load in Gat

Knotted from the October 1985 Atari User but had to stop for lunch. So I decided to put what I had printed so far on to a blank tape – a Boots C15 computer cassette.

But after loading it an Error 139 message came up on the monitor.

I would like to know what an Error 139 means and what I am doing wrong as I followed the instructions out of the Atari 1010 program recorder owner's guide – **Gareth Lowe, Cowbridge**

● Error 139 is Device NAK which doesn't mean quite what it sounds like! Rather it means that the device with which the micro is trying to communicate isn't acknowledging.

Make sure the power is getting to the recorder (is the light lit up?) and that the cable from the micro to the recorder is firmly pushed home at both ends.

With your program in memory press Record and Play together, type CSAVE and press Return twice.

This should save the program which can later be loaded back in using CLOAD.

Cheaper RAM pack?

I AM the unfortunate owner of an Atari 600XL. I say unfortunate because I only bought the damn thing just over two years ago before the 800XL was released, in the full anticipation that the promised expansion RAM pack would be available early in 1984.

I have not only seen the price of Atari drop to £165 for Atari 800XL with disc drive I've seen the 600XL disappear without a trace.

So I am now fully resigned to leaving the Atari name and changing date I say it to Commodore.

But before I take this painful step – one last chance can somebody tell me how I get my hands on an Atari 600XL expansion RAM pack?

Or better still come on Jack, let's have a RAM pack offer with free software for £60 or less to show those who had faith in Atari when in the doldrums that it was not misplaced – **J B Giscott, Bideford**

More on utilities

CONGRATULATIONS! For the first time that I can remember you have reviewed a utility in Stephen Donaghue's excellent little article on Basic XL (December 1985).

Of course as with other Atari software the sting comes in the tail with the usual exorbitant price £75 or so, but that is Atari's fault or the software houses not Mr Donaghue's.

We normally get reviews of four games in Atari User but in the 1985 December issue we had no less than 14 games reviewed if you count Brilig's Adventuring article.

Utilities business and educational software gets scant attention by comparison. May I make a suggestion that you make a New Year resolution to put this imbalance right, and in future issues divide your software reviews equally between games and the non-games software?

Beginners like me haven't a clue which non games software is worth looking at. Most of them are just names to us and we would like a lot more information on what they do so that we can decide whether or not to buy.

Take a look through the lists of your advertisers to see just how little information is provided – and of course they are biased. We do need impartial reviews on non-games software, please.

Perhaps Jack Tramiel & Co should be looking at getting software prices reduced, as well as the hardware? Even if you can afford it Atari software is a real pain to find – unlike other popular makes of computer.

May I confirm what some of your other readers have said about the failure of Silica Shop to provide an information mailing service as advertised.

I bought my 800XL and peripherals in March 1985 and I am still waiting for my first information sheet.

When you phone them they tell you that there have been delays or words to that effect.

This is simply not good enough – they should stop advertising this service if they cannot provide it.

With production of the 800XL now coming to an end, I hope that Atari User will still cater for the 800XL owner for some time to come and not get carried away with enthusiasm for the new machines at least until owners of the older machines have up-dated their hardware.

Hopefully as the new machines become more plentiful, retailers will start to offer worthwhile trade in deals to encourage owners of older machines to update.

Otherwise I can see the market becoming saturated with no movement of the new machines.

How about a dustcover for the 800XL like the one for the 130XE?

Best wishes – keep up the good work. Atari User is improving all the time – **C H Tadman, Westgate-on-Sea**

● To a large extent we rely on software being sent by the manufacturers for review. Since most of the software released is games the review pages reflect this.

We produce a dust cover for the 800XL – see Page 61

York group

We are a group of Atari enthusiasts in and around York setting up a user group.

I would be grateful if all people interested in joining would in the first instance contact me on York 706391 or at the address below – **J P Nelson, 10 Dringfield Close, Dringhouses, York YO2 2TQ.**

Not-so-smashing hits

I HAVE a problem with Smash Hits volume 1. It has suddenly decided that it is not the original version and when it boots it cannot get past the stage where it searches for its bad sector.

I have a feeling that it is my disc drive's speed even though I can still access my old files from when I first bought my Atari about three years ago.

I am a Christian and have designed my alternate (very alternate) version of Pacman. It involves you running around the church collecting up the hymn books after the service.

The pews make up the maze and devil shaped characters chase you around the screen. Of course there were Bibles scattered around the maze so you could chase the devil away with scripture.

The first time I typed my program into my Atari 800 it locked up just as I typed in the SAVE command – it locked mid sentence not after I had pressed Return.

The second and third times I typed it in the same thing happened. The fourth time however – 10 very sore fingers later – I saved the program every 10 minutes.

However when it came to save the final version the computer started its save and then stopped after about two seconds leaving me with all the pretty colours my computer usually saves for when I can't get a display list to work properly.

I came to the conclusion that someone didn't want me to finish this program – **Matthew Sims, Epsom**

● You could have a drive speed problem – in which case have the drive tested by an engineer. It should be 288 rpm or thereabouts.

Also the disc could be faulty which you can check by trying it out on a friend's machine or at a friendly local shop.

MIKES COMPUTER STORE

292 London Road, Westcliff-on-Sea, Essex.
Tel Southend (0702) 332354

ATARI 520ST + FREE SOFTWARE	749.99
ATARI 520ST + 2 DRIVE SYSTEM	899.99
ATARI 520ST + EPSON LX80 PRINTER	999.99
ATARI 130XE COMPUTER	129.99
ATARI 1050 DISK DRIVE (DDS 2.5)	129.99
ATARI 130XE/1050 DISK DRIVE PACK	259.99
ATARI 102D PRINTER + TOUCH TABLET	189.99
NEW ATARI XG11 FAXGRAM RECORDER NEW	34.99
EPSON LX80 PRINTER + TRACTOR FEED	299.99
EPSON LX80 + TRACTOR + INTERFACE	338.99
ATARI 850 INTERFACE	99.99

ALL THINGS ATARI + PLUS SOFTWARE GALORE

YOUR LOCAL ATARI SPECIALIST

VISA

OPEN 9.00-5.30pm MON-SAT

STOCKSOFT

ATARI ONLY* MAIL ORDER ONLY

BOUGHT A DISA PRINT?
Stock with programs on tape
TRANS-PAC REV 2 Now released. Six disks with many more utilities including multi-tape to multi-tape disk, multi-tape to mono disk, tape to tape, tape to disk etc disk. Much more all files convert packaged on three double-sided Memorex disks.
£25 post free

TAPE CRACKER REV 2
BRIDA A Will not M/C prog to screen, you edit. Download your extended/short version with or without M/C knowledge. Has a full load changing text to save personal messages on screen. Stuck on an adventure screen? No cheat. Also lets to back up your Atari saves.
S.E.I.S. For the advanced user contains a disassembler. All this for only £10 on 3.5" disk. Tape post free.

XL FIXER
We'll now easy to play games we rise to 400/800

For details of our other utilities of tape disk game packs with games for only £2 each, send large SAE to

STOCKSOFT
15 Woodbrooke Road Birmingham B30 1UE

CARTRIDGE TRANSFER SYSTEM

FAST LOADER

CENTRONICS PRINTER INTERFACE

PROM PROGRAMMER

S TERRELL
17 Cock Close Road, Yaxley, Peterborough PE7 3HJ

SUNARO
software

**** WINTER SPECIAL OFFERS ****
** ORDER TWO CASSETTES DEDUCT £1 EXTRA **
** ORDER TWO DISKS DEDUCT £2 EXTRA **

Cassettes			Disks			Disks	
FIGHTER PILOT	48k	8.95	SUPERSCRIPT		99.95	FIGHTER PILOT	19.95
ZYBEX	64k	6.95	GRAPHIC ART DEPT.		59.95	SUPER BASE 64	19.95
ZORRO	48k	9.95	PAGE DESIGNER		29.95	SUNARO W.P. 64	19.95
TAPE COMPARE	48k	5.50	ATTACK OF THE ASTEROIDS		19.95	HOROSCOPE FRACTALUS	2.75
SPITVENTURE	48k	9.95	WIZARD & PRINCESS		12.95	BALL BLAZER	12.95
TAPPER	48k	9.95	INTRUDER		9.99	GT POWER BOAT RACE	7.75
KENNEDY APPROACH	48k	12.95	DARK CRYSTAL		12.95	KARATE ACE	9.95
PHOTON FRACTION	48k	9.50	IMPOSSIBLE MISSION		14.95	HACKER	9.95
HACKER	48k	9.95	CYTRON MASTERS		24.95	REALM IMPOSSIBILITY	9.95
DUKTRA IX 3D	48k	9.50	Kingdom Apprehension		4.95	SPITFIRE 40	11.50
BREAKTHRU 2	48k	9.50	1 TO 1 TRIPLE EAGLE		14.95		
MIDNIGHT	48k	9.50	THE KEEPER		12.95		
ISLAND PARADISE	64k	9.50	SPITVENTURE		12.95		
JAMBUNT	48k	9.50	BLUE BOX 3D		12.95		

New titles always available on release. Please include postage and VAT

SUNARO SOFTWARE (AU)
PO Box 78, Macclesfield, Cheshire SK10 3PF
Telephone 0625 25333

ATARI USER *is looking for new writers.*

The ever-expanding ATARI USER needs more new writers and programmers.

If you think you can fit the bill – can write good English, have a working knowledge of the Atari range and/or feel at home among all kinds of programs – write to us sending a curriculum vitae and sample of your work to:

The Managing Editor
Atari User
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

Do it now *– this could be your big chance to enter the exciting world of computer journalism!*



You'll be driven to distraction by

ELEKTRAGLIDE

– the new high-speed fantasy racing game from English Software suitable for all 48k Atari machines

. . . and you can

SAVE ALMOST £8

if you buy it at the same time as you take out a subscription to Atari User!

Our price:

£3.50 on tape *(RRP £8.95)*

£5.00 on disc *(RRP £12.95)*

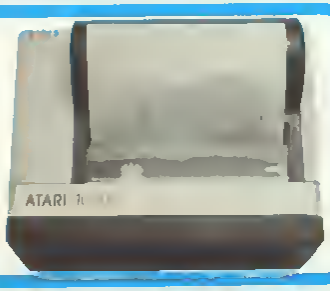
Not at or above all these special prices without subscription

Atari 1020 printer/plotter

The Atari 1020 comes complete with a power unit, input/output cord, 2 sets of pens, a roll of paper, an operating instruction book and a cassette containing demonstration programs

Atari User price £75.79

Recommended retail price £99.00



These back issues are still available



May 1985 issue: Profile of Jack Tramiel preview of the new machines Attack Squash Adventuring Alphabet Train Hexer utility, Software reviews Sounds, the 6502 Microscope, Atari Insights Bit Wise Beginners and Graphics

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

July issue: Disassembler Bomb Run DOS 2.5 I/O Commandments Adventuring Display List Tutorial Software reviews Power Functions, Treasure Hunt, Keyboard Sounds Microscope Insights Bit Wise Beginners and Graphics

August issue: Analysis of 520ST program protection routines Fruity Gambler Assembler Touch Tablet programs, first look at Logo for the 1027 Disc 2.5 upgrade offer Display List Tutorial, Microscope Software reviews, Insights Bit Wise Beginners and Graphics

September issue: 8-page special on the 520ST Mode 4 screen dump routine Maze Munch Data Maker Display List Tutorial, 68000 addressing modes list processing with Logo Software reviews Insights Bit Wise Beginners and Graphics

October issue: Computer Canvas graphics program Updates for RAW 6502 assembler 130XE Ram disc utility Hex/Ascii memory dump utility Pentoon, Software reviews 68000 operating environment, Wraptrap Insights – Bit Wise Beginners and Graphics

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

December issue: Check sum program, Special keyboard characters Basic XL review GemWrite and GemDraw Countdown game Disco Display List tutorial Software reviews Left handed joystick, Adventuring Beginners and Graphics

January 1986 issue. Machine code gamer Pt. 1, Atari in education, Sony ST monitor review, Hunchy game Check sum update, Listing utility Dungeons game 1020 screen dump routine programming in C on the ST Adventuring, Software reviews

Keying in long programs too much of a chore?

Then give your fingers a rest by sending for our monthly disc or cassette containing all the programs from each issue of Atari User. See order form opposite



MAY Alphabet Train The combination of colour sound and an inborn makes this early learning game a winner with the children. **Sounds Interesting** Drive your neighbours up the wall with these ready-made sounds. **Hexer** Enter, display and run machine code programs with this hexadecimal loader. **Attack Squash** A fast action game to keep you on your toes. **Reaction Timer** See how fast your reactions really are. **Binary** Convert denary numbers to binary notation.

JUNE Frog Jump Guide the frog across the road and over to his home in this version of the arcade classic. **130XE Ram Power** Use the extra 64k of memory to good effect, or use the drive to put lots of pictures on the pretty displays. **Submarine** Scuttle the Kriegsmarine. **Etcha Sketch.** Draw pretty pictures with only a joystick. **Random Numbers** Get random numbers from machine code. **Filthy Fifteen.** Can you keep the Filthy Fifteen happy in their cells?

JULY Bomb Run. Flatten the deserted city and land safely. **Disassembler** Find out what's going on deep inside your Atari. **Treasure Hunt.** Use logical thinking to find the treasure. **Password Generator** Keep getting log passwords till you find one you like. **Keyboard** Convert your micro into an organ. **Quasimodo** Can you sort out the mess of ropes in the belfry?

AUGUST Assembler Make machine code programming easier. **Fruity Gambler** Save money, with this fruit machine simulation. **Mandala** Complex patterns made easy. **Protection:** Protect your programs from prying eyes. **Display List:** Demonstration programs. **Raider 1997** Futuristic text adventure. **Touch Tablet** Demonstration programs.

SEPTEMBER. Maze Munch. Help Horace the Blob munch the maze monsters' morsels. **Data Maker** Convert your machine code routines to DATA statements. **Display List** Demonstration programs. **Screen Dumps:** Dump your Mode 8 screens to 1029 printer. **Bricks:** Solve the Jinks problem.

OCTOBER. Pontoon: Twist? Bust! **Memory Dump:** Examine memory in hex and Ascii. **Display List:** Demonstration programs. **Wrap Trap** Action game for one or two players. **Computer Canvas** Make your own picture master piece. **Assembler Update.** Improvements for the RAW assembler. **Ram Disc.** Make the most of the 130XE's extra memory.

NOVEMBER. Guy Fawkes: Help Guy escape from the guards. **Converse:** Teach your Atari to be a psychotherapist. **Display List** Demonstration programs. **Bitwise Operators:** Utility to provide logical functions. **Circle.** Draw and fill a circle. ***Plus*** Freebie of the month – **Creepshow** machine code pinball game.

DECEMBER. Countdown Micro version of the famous TV game. **Get It Right!** Atari User's own check-sum program. **Disco** Boogie on numbers on your Atari. **List Utility:** Makes listing easier. **Display List:** Demonstration programs. **Plus:** Freebie of the month – **June's Program** machine code entertainment.

JANUARY 1986 Bells Help Mr Humpy rescue Esmerelda. **Get It Right!** Atari User's own checksum program. **Alien Attack:** The game to accompany the machine code series. **Lister** Make listing programs easy. **Dots.** Play the micro or another player at this strategy game. **Dump** 1020 printer/plotter routine. ***Plus*** Freebie of the month – **Scramble Fighter** machine code game.

FEBRUARY Horse Play: Knights tour program. **Micropainter** Programs to manipulate Micropainter screens. **Clock:** Interrupt driven clock utility. **Flasher** Flashing colour utility. **Bounce!** Simple to play hand to master. **Bridge:** The thinking person's card game. ***Plus:*** Freebie of the month. **Demon's Lair** – an adventure game you may never escape from.

FREE

Can you escape from the Demon's Lair this month's freebie? It's an adventure game with enough red herrings to start a fish factory.

And remember you won't find it listed in the magazine – it's only available if you buy the monthly cassette or disc

See order form opposite

Your Atari needs protecting

Now for the 800XL

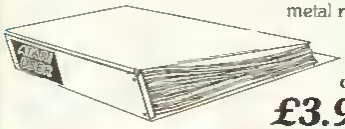
Protect your 130XE or 800XL with our luxury dust cover made of soft, pliable, clear and water resistant vinyl, bound with strong cotton and decorated with the magazine's logo.



only **£3.95**

Keep your collection complete

Bound in chocolate brown pvc and bearing the Atari User logo, this handsome binder will hold a year's supply of the magazines firmly secured in place with metal rods



only **£3.95**

Double your disc capacity

Allows you to cut out a correctly positioned notch which will enable you to use BOTH sides of the disc – and HALVE your costs. Extremely well made to a compact design, it has a unique position guide to assure pin point accuracy!

Order now and we'll also send you an Atari disc containing DOS 2.5 absolutely free of charge!



£9.95

All prices include postage, packing and VAT. Overseas orders despatched by Air mail.

Valid to Feb 28, 1986

Please enter number required in box. √ | £ | p

Annual subscription
UK & EIRE £12 (sterling only) 7001
Europe £15 7005
Overseas (Air mail) £30 7006
Commence with ____ issue

Add £3.50 (tape) or £5 (disc) to your subscription to receive Electraglide — Tape* 7061, Disc* 7062
*Only available if covered by subscription order

Back Issues
£1.25 UK & Eire
£1.75 Europe
£2.75 Overseas Air mail

May	7005
June	7006
July	7007
Aug	7008
Sept	7009
Oct	7010
Nov	7011
Dec	7012
Jan 1986	7013

Monthly Cassette/Disc

Cassette
£3.95 UK
£4.95 Europe Overseas

Disc
£5.95 UK
£6.95 Europe Overseas

	Cassette	Disc
May	7017	
Jun	7018	
Jul	7019	
Aug	7020	
Sept	7021	
Oct	7122	7022
Nov	7123	7023
Dec	7124	7024
Jan 1986	7125	7025
Feb	7126	7026

T-Shirt
£4.95 UK
£5.95 Europe
£6.95 Overseas Air mail

Small	7047
Medium	7048
Large	7049

Dust Cover
£4.95 UK
£4.95 Europe and Overseas

130XE	7091
800XL	7060

Binder
£3.95 UK
£5.95 Europe — Overseas Air mail £6.95
7029

Disk Doubler + free DOS 2.5
£9.95 UK & Overseas
7051

1020 Printer/Plotter
UK only
£75.79
7063

Learning is fun

TellyTurtle	tape £7.95	7055
	disc £11.95	7056
Simulated Computer	tape £7.95	7057
	disc £11.95	7058
Brain Strainers	disc £11.95	7059

Overseas orders add £1 p&p per order

Payment please indicate method (√) TOTAL

☐ Access, Mastercard, Eurocard

☐ Barclaycard/Visa

☐ Cheque/PO made payable to Database Publications Ltd

Credit card expiry date /

Name _____

Address _____

Signed _____

Send to: *Atari User* FREEPOST, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

(No stamp needed if posted in UK!) *Please allow 28 days for delivery*

Orders by phone: 061 480 0171
by Prestel: Key *89 Mailbox No. 614568383
by Telecom Gold: Mailbox No. 72 MAG001

Don't forget to include your credit card number and full address. ATI

PLEASE NOTE

ATARI 600/800XL/130XE
DUAL OPERATING SYSTEM

You could have a dual operating system with the flick of a switch. This will allow you to run all known software written for the 400 and 800 computers or your XL/XE.

It consists of a small circuit board which simply plugs inside your computer

Price £29.95

Mail Order to

G. PAUL

3 Francis Ward Close, Hilltop, West Bromwich, West Midlands B71 2BY

ADVERTISERS INDEX

Atari	16 & 17	Mikes Computer Store	59
Centretime	6	Miles Better Software	48
Chips	62	Modern Houses	39
Compumart	22 & 31	P F Software	44
Databyte	3	Page 6	52
Datascope	28	Psygnosis	31
Digicom	62	G. Paul	62
Digital Integration	2	Rock Hard Soft	62
Film City Video	46	Silica Shop	63
Haystack Peripherals	43	Software Express	10
Homeview Video	50	Stocksoft	56
J & J Softsales	62	Strategic Plus	50
K E C M	44	Sunaro Software	59
Kuma	64	TDI Modula	21
Ladbroke Computing	44	Teletex	62
Metacomco	25	Wootton Computers	50
Microworld	43	Zimmer Computers	62

TELETEX

West Yorkshire's ATARI Specialists

Retail Division Discounted hardware & Software

Special Offers
- * Blank Disks — £9.95 (TEN-PACK!)
- * 1050 Disk Drive & Software — £128
- * 1027 Letter Quality Printer — (RRP £249) – £149
- * 130XE Cassette Pack — £104
- * 520ST (Full Package) — £749

Mail Order Division Please send £1.50 for full catalogue inc. software hardware offers peripherals, and books

Owners Club HQ of West Yorkshire Atari Owners Club (WYACO) Meetings newsletter discounts software hire, exhibition trips free helpline Full details & application form from Rod Bates at address below or phone 0274 875209 anytime. (0924 422048 Eve)

TELETEX (YORKSHIRE) LTD

26 Brooklyn Court, Bradford Road, Cleckheaton, West Yorkshire BD19 4TJ Tel 0274 875209

AFFORDABLE SOFTWARE

AVAILABLE ON CASSETTE, DISC AND CARTRIDGE

Just look at this small selection from a Big range

Chuckie Egg (c)	6.25	Demolition (c)	7.50	Ghostbuster (c)	7.50
Emmanuelle (c)	7.50	Baseball (c)	7.75	Up n Down (c)	7.50
Dropzone (c)	7.75	Emerald Isle (c)	5.75	Mine 2049er (c)	9.25
Spyhunter (c)	7.75	Dungeon Adv (c)	7.75	Gremlins (c)	7.75
Colossus Chess (c)	7.25	Pool Mania (c)	6.95		
Colossus Chess (d)	9.50	Bounty Bob (c)	7.50	THIS MONTHS SPECIAL	
Kissing Cousins (c)	5.95	Ghostbusters (d)	10.95	Mercenary (c)	7.50

All prices include postage and packing

Please send a stamped addressed envelope for price list

To order any of the above titles just send a cheque or Postal Order payable to

J + J SOFTSALES (Mail Order)

(Dept. AU) 17 Vernon Road Uckfield East Sussex TN22 5DX.

AT LAST!!
ST SOFTWARE

We have a selection of high quality arcade style games for the monochrome ATARI 520ST at sensible prices

INVAOERS FROM SPACE — **£7.50**
High speed machine code action all the features

POOL — **£7.50**
A superb simulation of this classic game

MUNCHERS — **£7.50**
Eat the pills before the ghosts get you Several mazes
Or any two on one diskette for only £10.00 All programs supplied on quality 3½" diskettes with full instructions

(Mail order)

ROCK-HARD SOFT

Rock House Great Elm Frome Somerset BA11 3NY

MIDI SYNTHESISER INTERFACE
for the Atari 800/800XL/800XL/130XE

Central MIDI equipped electronic instruments from your Atari
Hardware comprises MIDI IN THRU and OUT ports Complete instruction and example programs supplied Disk drive required
£59.95 inclusive

RS232 PRINTER INTERFACE

Connect your Atari to RS232 printers Works with BASIC ATARIWRITER etc Disk drive required £39.95 inclusive

MULTI TAPE TO DISK UTILITY

Transfer single AND multi stage tapes to disk and then run them from a fast autoload menu The only one that can handle five stages.
£10.95 inclusive

CASSETTE BACK-UP UTILITY

* Re-records cassette software at any of thirteen different speeds Can even handle non-standard format tapes £9.95 inclusive

Cheques/P O to **DIGICOMM**

120 Bradwell Common Boulevard, Milton Keynes, Bucks MK13 8BB

Tel 0908 69360

* These products shall not be used on copyright material

ZIMMER COMPUTERS

Warp speed with True Double Density

THE HAPPY 1050 ENHANCEMENT

Allows you to backup any disk

ONLY £195.00 Inc P&P

(NOT TO BE USED ON COPYRIGHT MATERIAL)

No Notch Disk Protector

Write to the reverse side of disk without notches protects from accidental erasure

Simple plug in no cutting drilling or soldering

ONLY £15.00 Inc P&P

CWO allow 28 days despatch

Zimmer Computers

54 Chiltern Avenue, Shepshed, Leicestershire.

Tel 0509 505335 for details

CHIPS
ATARI SPECIALISTS

WE BUY, SELL, PART EXCHANGE

ALL TYPES OF COMPUTER EQUIPMENT

THE LOWEST PRICES POSSIBLE

XL, XE, ST RANGE ALL IN STOCK

RING US LAST FOR THE BEST QUOTE

CHIPS COMPUTER CENTRE

53 RUGBY ROAD, WORTHING, SUSSEX BN11 5NB

NEW BULLETIN BOARD SERVICE

300 Baud Ring Back Tel (0903) 503711 20.00hrs-08.00hrs.

TEL (0903) 40608 (24 hours)

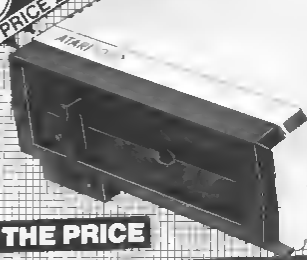
ATARI 1050 DISK DRIVE

WITH FREE SOFTWARE

WORTH £34.96

SAVE £70

PREVIOUS PRICE £199



NOW ONLY £129 inc VAT

OR 12 MONTHS AT £12.46

POWER WITHOUT THE PRICE

NEWS FOR ATARI 8-BIT COMPUTER OWNERS

Sutton Shop Limited, UK's leading Atari specialists based in Sidcup, Kent have produced an exciting new product for the Atari 1050 Disk Drive. The 1050 Disk Drive will work with the Atari 400 800 and XL/XE range of computers and is designed to give the user access to a huge library of software titles. The 1050 comes with DOS 2.5 software which can be used with Atari Basic and is also compatible with the Atari Pascal and Logo languages. Operating System making it compatible with the complete range of Atari computers. The Atari 1050 Disk Drive is a great enhancement for any Atari computer system increasing storage capacity, data transfer speed and reliability. Many programs which will not run on tape will run on disk and the 1050 Disk Drive makes the Atari computer more versatile than ever before.

SUPERB TECHNICAL SPECIFICATIONS

FREE SOFTWARE

BUY NOW - PAY LATER

OUR SPECIALIST SERVICE

FREE POST & PACKING

12 MONTH GUARANTEE

ORDER NOW - OR SEND FOR A CREDIT APPLICATION FORM

Silica Shop Limited, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX Telephone: 01 309 1111

HOTLINE!

If you can't wait to get your hands on a brand new 1050 Disk Drive for your Atari 8-bit computer and you have a credit card or charge card phone our hotline now! We accept Access American Express Barclaycard Diners Club Mastercharge and Visa. Telephone our hotline with your card number and your address details and we will dispatch a disk drive to you TODAY! You can also call the hotline to request a credit application form if you wish to take out credit facilities with HFC Trust.

☎ 01-309 1111

1050 ORDER FORM

To: Silica Shop Ltd, Dept WMI 0186, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

Please send me **1050 Disk Drive(a) at £129 each**

Mr/Mrs/Ms *Initials* *Surname*

Address

Postcode

☐ **I enclose a cheque** for £ (made payable to Silica Shop Ltd)

☐ **Please debit my credit card**

CREDIT CARD NUMBER £

We accept: Access, American Express, Barclaycard, Diners Club, Mastercharge, Visa

☐ **I wish to pay by credit** (12 monthly credit instalments)

Please send me written details and an application form

What's on the desktop?

Kuma ATARI

KSPREAD Spreadsheet

This professional package combines full use of the ST's large RAM capacity with its fast processing speed and facilitates easy data transfer with the KUMA word-processing, database and communications packages

An easy-to-use Spreadsheet enjoying the benefits of the user friendly *GEM system with it's mouse-driven icon selection and multi-window presentation



NEW ★ NEW ★ NEW ★ NEW ★ NEW ★ NEW

KSEKA Assembler

(Sixty eight K Assembler) – The fast and easy to use assembly system for the generation and analysis of 68000 code programs combining full use of the ST's large RAM capacity with an impressive list of useful features

KRAM RAM Disc

Enables one or more RAM discs to be set up as high speed *floppy discs The spectacular improvements in the speed of file handling are immediate! – files are accessed and written to between 40 and fifty times faster

Get down to business with Kuma - first off the mark for the ST

Available from your ST-Dealer

Kuma Computers Ltd Unit 12, Horseshoe Park Horseshoe Road, Pangbourne, Berks RG8 7JW

Please send further details of the Kuma ST range

Name ...

Address ...

Phone

Trade Enquiries Phone 07357-4335

AT2