

A Database Publication

ATARI USER

Vol 1 No 107 February 1986 £1

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,
C64 & AMSTRAD

FREE COLOUR
POSTER AVAILABLE
WITH DISK VERSION

BY D.K. MARSHALL
ADAPTED BY MIK SEN

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



A SPECTACULAR FLIGHT
SIMULATION OF THE
WORLD'S MOST EXCITING
JET FIGHTER WITH
STUNNING 3D SCULPTURE VIEW
AND DEADLY 3D AIR TO AIR
COMBAT.

The SUPREME SIMULATION...
It takes the hot action to your desktop
SPECTRUM VERSION VOTED
"Simulation of the year - 1987"
by CRASH MAGAZINE READERS.

- ATARI**
Fighter Pilot Box ☐ £12.95
Fighter Pilot ☐ £9.95
SPECTRUM
Sculpture ☐ £9.95
Fighter Pilot ☐ £9.95
Fighter Pilot Box ☐ £17.95
COMMODORE-64
Sculpture ☐ £12.95
Sculpture Box ☐ £9.95
Fighter Pilot Box ☐ £14.95
Fighter Pilot Sculpture ☐ £9.95
AMSTRAD CPC 644 ☐ £9.95
Fighter Pilot ☐ £9.95
Fighter Pilot Box ☐ £12.95

Checkers payable to Digital Integration Ltd
I enclose a cheque/P.O. for _____ Total
Name _____
Address _____

Please debit my Access/Visa card no. _____
Expiry date _____
M/C card no. & cvc number with M/C _____

Please send to
**DIGITAL
INTEGRATION**
Watchmoor Trade Centre,
Watchmoor Road,
Cambridge, Surrey
GU10 2JL
UK



Trade and Export enquiries
welcome. E-Mail: enquiries@digital-integration.co.uk



Vol. 1 No. 10 February 1988

Managing Editor: Derek Macklin
Features Editor: Cliff McKnight

Editorial Team:
Mike Babb
Alan McLaughlin
Kevin Edwards
Pete Babb
Roland Waddilove
Austin Willey

Technical Editor: Peter Glass
Production Editor: Heather Sheldrick
Design Editor: Mike Cowley

Advertisement Manager: John Belling
Advertising Sales: John Snowden
Editor in Chief: Peter Beafield

Editorial: 081 488 8838
Administration: 081 488 8383
Advertising: 081 488 8500
Subscriptions: 081 488 0113
Telecom Gold: 18 88403001
Telex: 355871 MONREP G
Quoting Ref: 79-MAJ0001
Postal Mailing: 01488 8383.

Published by:
Database Publications Ltd,
Europa House, 88 Chester Road,
Hazel Grove, Stockport SK7 8NT.

Subscription rates for
12 issues, post free:
£12 - UK
£15 - Europe
£20 - 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 *exclusive basis*.

© 1988 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:
European Sales and Distribution Limited, 11 Brighton Road, Crawley, West Sussex BN10 8AP. Tel: 0293 37083.

News

All the latest developments in the expanding world of Atari computing.

7

Atari Computer Show

Your red-hot-price advance ticket for the biggest event of the year for all Atari users.

11



Logo

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

12

Machine Code

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

18



Game

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

23

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 Brillog boldly goes where no hand has set foot.

38



Software

Something for everyone this month with Righter Pilot, First Steps with Mr Men, Axis Assassin and Panther Grenadier for the 8 bit machines and an adventure starter pack for the ST.

41

Programming

Ian 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 Emeralds 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 Brillog!

See Page 60

Centretime Limited proudly announce

the NEW RELEASE OF

HILDERBAY SOFTWARE

By:
Mike Salem

CENTRETIME LIMITED
PO BOX 301, KINGSTON-UPON-THAMES
SURREY KT1 1SN TEL: 01-541 1424
TLX: 265871 MONFREP G. QUOTE: 72-28030

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

The ideal and versatile PAYROLL for
small and large business users

£119.00 plus VAT

HILDERBAY BOOK-KEEPER

A flexible Journal which may be used
as Purchases, Sales, General or Cash Ledger

£119.00 plus VAT

HILDERBAY INVOICER

Makes the tedious task of typing invoices
just that little bit easier

£119.00 plus VAT

HILDERBAY SSP STATUTORY SICK PAY

£119.00 plus VAT

PAYROLL UPDATE FOR EXISTING USERS: £48.00 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 301, 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!

AM 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 based.

To be held at the Royal Hotel, Manchester, 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 Denis 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 subsidiary 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 recent 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 Sigma 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 1300XL.

"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 1300XL'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 capacities as 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 1300XL exclusively".

ST software growing

THE new year began with an amazing total of nearly 180 software items available from UK suppliers for the ST085.

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 des-

cribes 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 160 titles of which only 81 are classified as "entertainment".

The others include 14 accounting packages, 10 word processors, three spreadsheets, nine databases, five communications packages, six graphics packages, 18 programming languages and 11 utilities.



Right on cue

DOMCASTER based software house CDS is right on cue with its introduction of Steve Davis Breaker 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.

Ball 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 shoot key allows the move to be reset and the table to be reset to its previous position.

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

Steve Davis Breaker 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 Lawton, boss of utility specialist Computer Support, told Atari User last month that he will give £100 for infor-

mation leading to the successful prosecution of those guilty of pirating his products.

This followed his discovery that his firm's machine code monitor Ultimem and 80 column text mode 80 Columns Pack had

been copied and were available on the black market. But Lawton's stand has angered several Atari users who feel he wants to "have his cake and eat it too".

One of them, Andrew Rafter, secretary of the Plymouth Atari User Group, said: "I personally find it very hypocritical of Mr

pirate either 'compared' software. The offending products are the disc, cassette and cartridge backup programs and most notably the disc drive modification that Sector which is especially useful to anyone wishing to copy commercially available programs (protected by - yes, you've guessed it - bad sectors).

"Even the ROM-based Ultimem could be used to pirate software if it is anything like its American look-alike 'Ultimem'.

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

Mr Lawton's range of utilities comprises mainly piece aids such as Ultimem 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 Lawton.

He told Atari User: "Any utility can be part of the toolset 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".

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.

Swan Sparitus 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 5BB.

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

Barnes and Davies Council for the Disabled is sponsoring New Developments in Disabled using on April 2 at Barnes in Surrey. Enquiries to Mrs S. Hodgins, Health Education Department, The Rectory, Bridgen Street, Uxbridge, Cumbria.

Reward offered to trap pirates

REWARD for the catching of those guilty of pirating his products.

From last month's Atari User

major leading to the successful prosecution of those guilty of pirating his products.

This followed his discovery that his firm's machine code monitor Ultimem and 80 column text mode 80 Columns Pack had

Lawton 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

Atari UK denies ST price - slashing report

A REPORT from America that Atari is about to dramatically slash the price of the £2087 has been officially dismissed as "speculative rubbish".

The story which subsequently appeared on Microsoft, the UK electronic mail service, claimed that the price of the machine was to be dropped to \$239.

It alleged that this was to be timed to coincide with the launch of a 1 megabyte version of the ST - known as the 12400ST - to be marketed "with colour monitor for \$999".

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

"There are simply no plans to reduce the price of the £2087 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 will come with a modulator. And it will not be sold in the UK."

"We remain convinced that the present £2087 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 diplomatic.

"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 a further report from the United States that the proposed 2400ST was to be dropped, Rob Harding insists it is still on its way.

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

Failure

ATARI has pulled out of a deal to bundle Digital Research's GEMWare and GEMPhone with the £2087 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 SST, and DB Master One, a business database from USA's Businessmaster.

"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

Software to fight heroin

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

Granville Graphics, Anticipation and US Gold have



all donated programs to "Off the Hook", a games competition 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 £750,000 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

TERRORSOFT is working on an incorporation of its Fleet Street Editor program which it claims will turn the £200ST 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.

February 1986 A User's Guide 9

Five get converted

BUGGET software house Blue Ribbon has converted five of its established range for the 486 Atari - *Castle Assault*, *Diamond Mine*, *1, Highways*, *Mane*, *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 manager of menials". In *Diamond Mine* it is to gather precious stones from tunnels

and shafts while avoiding a host of obstructive bugs.

Cups of coffee have to be found, escape keys collected and monsters avoided in *Highways*. *Mane*, 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 8008L.

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 positive with the prospects for 1986.

"This will be the year of Atari", says Tony Deane of Silica Shop. "For the sale of all

these XLS has helped create an enormous marketplace for software and peripherals.

Competitive

"And the 1300XL is doing 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 £200ST 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 - *MageWorks*, a version of the *AtariSoft* arcade game, and *DocEd*, a graphics painting package.

"We believe that these will

make the £200ST 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 £200ST.

"Now we appreciate the fact we were a month late in



As Harding: "Even stronger package now".

delivering for approval", he told Atari Users. "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: "It is in this case, we'll market it ourselves to Atari users".

SOFTWARE EXPRESS

COMPUTER SYSTEMS LIMITED



SC's Quest for Ties.....	(B)	14.95
City Mail.....	(B)	14.95
Alternate Reality.....	(B)	29.95
Spell Breaker.....	(C/L)	24.95
Acrypt.....	(B)	24.95
Surviving.....	(B)	24.95
Sliver Service.....	(B)	24.95
Bounty Box Strikes Back.....	(B)	22.95
Paperyell..... Special Offer.....		24.95
Huntspat.....	(B)	29.95
Continental's Universe.....	(B)	29.95
Bytefile.....	(B)	49.95
Synword.....	(B)	49.95
Synword.....	(B)	29.95
Highway Pilot.....	(C/D)	9.95/12.95
Super Jason.....	(C/D)	9.95/14.95
Kennedy Approach.....	(C/D)	14.95
Monetary.....	(C/D)	9.95/14.95
Bravura..... Interactive Disk Adventure.....		29.95
Trax..... Interactive Disk Adventure.....		29.95
Masterblast.....	Imaginative Disk Adventure.....	29.95
Party Quiz.....	(B)	29.95
Education/General Knowledge Quiz Disk.....		19.95
U.S.S. Toolkits.....	(B)	22.95

Hobo Day.....		29.95
Hobo Hopper 'C'.....		24.95
Hobo Writer.....		24.95
Hippo Almanac.....		24.95
Hippo Background.....		29.95
Hippo Simple (Database).....		49.95
A Mind Forever Voyaging.....		44.95
Out Thru.....		29.95
Destiny.....		22.95
Erchanter.....		29.95
Hostlers Guide to the Galaxy.....		29.95
Infidel.....		44.95
Planetfall.....		22.95
Scavenger.....		22.95

Spellbreaker.....		49.95
Scatter.....		24.95
Scatter.....		49.95
Scatter.....		24.95
Suspended.....		49.95
Wanderings.....		29.95
Winnies.....		29.95
Zone II.....		22.95
Zone II.....		44.95
Zone III.....		44.95
K-Ram.....		29.95
K-Ram.....		49.95
K-Speed.....		49.95
Box.....		29.95
PC Interchange (XT/100 Personal Emulator).....		129.95
The Final Word.....		199.00
Figures.....		19.95
Land of Holes.....		19.95
Mr/Disk + Soft Speed.....		19.95
Multiplex.....		19.95
Personal.....		29.95
Resonance.....		24.95
Ultima II.....		67.95
Module 2.....		29.95
Amiga (Hard Processor).....		To be announced
Pixelate (Database).....		29.95
Ham Disk/Printer Spooler.....		24.95
ZOLL/Word (Adventure Twin Pack).....		24.95

NOW AVAILABLE!

ST COLOUR MONITORS

PRINTER LEADS

5MB 5.25" DRIVES

1MB 5.25" 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.



"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 return will (name £1) £
☐ Under 16s return £1 (name £1) £
 Total £
☐ Charge enclosed made payable to
 Database Publications Ltd.
☐ Please debit my credit card account

**ATARI
COMPUTER
SHOW**

**Advance
ticket order**

Post to: Atari Show Tickets,
 Europa House, 68 Chiswick Road,
 Uxbridge, Middlesex UB7 5DZ.

Name
 Address

Amount Enclosed Amount Enclosed Amount Enclosed

The
 distribution at show:
 £2 (adults) £2 (under 16s)

Typed

PLEASE ORDER BY PHONE: 061-488 8171
 Please quote code and number and full address.

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 last 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 talking 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 4 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 BB, 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

The Turtle



SOL GUBER
looks at list
processing on
the Atari using
Logo

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 list 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.

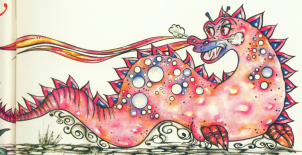
To make the turtle draw a dragon curve is very easy. The classical dragon curve, of order 1, is L. This means that the turtle walks forward so far and then makes a Left turn and

walks the same distance again. Order 2 takes the Order 1 curve, adds an R 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 made from the Order 2 curve. It is L-LR-L-LRR, again reversing the Ls and Rs in a backward direction. Order 4 is L-LR-LR-L-LR-LRR, 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 as 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 recursion 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 Logo 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 **R**. If it is, then **DRAG** is made equal to **[L]** and a classical dragon is drawn. If the character is not **R** then a line is printed to tell you to type **R** and **L** 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 (KEY?). If it has then the program stops.

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

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

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 D-COUNT DRAG then stop. 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 equal to WORK and CHAR 82 BL. 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, DRAW 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 made up of a series of R's and L's. 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 10 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 R's and L's 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 tasks of Logo is that there is not a screen dump routine written specifically for it that will work with any set 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 00 1 2 30, this corresponds to which pen is used to make the dot.

What the screen dump does is take the eight bits and divides 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 P 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 138 to put a black square on the printer. The 825 uses a 162 and the Epson a 235.

On the 825 a 160 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 (48-48-48-50) and then finally the coding for the actual printing (0-0-0-255-255-255-255). I have thus generated 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

6802 ASSEMBLY LANGUAGE

THE 6802 chip supports an 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. When an address is followed by X or Y this indicates that this is an indexed operation.

For example, STA 37692,Y means store the contents of the accumulator in address 37692 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 (37692+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 #15 means load the accumulator with a value of 15 — this is similar to the Basic command A=15 — whereas LDA 1526 means load the accumulator with whatever value is stored at address 1526.

Instructions such as BND or BNC are branching instructions. If a branch instruction is followed by a number between 0 and 127 the program jumps forward. Followed by 128 to 255 the program jumps backwards. For example, the routine CMP 15, BND 13 means compare the accumulator with 15 and branch if equal 13 bytes forward. The routine CMP 15, BND 238 again compares the accumulator with 15, but branches if equal 238-238 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.

NOW FOR ASSEMBLY LANGUAGE

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 37692,Y, whereas most assemblers replace the full word with a comma to give STA 37692,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 6802 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 6802 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



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

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 8, addresses 1838 to 1792, and I have also allocated some

[illegible]

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26



100	6300	100	6400	170	6600
200	6400	200	6500	200	6600
300	6500	300	6600	300	6700
400	6600	400	6700	400	6800
500	6700	500	6800	500	6900
600	6800	600	6900	600	7000
700	6900	700	7000	700	7100

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

It would perhaps have been enough to just use page 0 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 1 is a list of the stores used by Ellen Attard.

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

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

Figure 11 provides a list of these

MEMORONICS USED IN ALIEN ATTACK

ADD	Add specified contents to accumulator.
ASL A	Shift left contents of accumulator.
BCR	Branch if carry clear.
CCS	Branch if carry set.
DEC	Decrement if equal.
INE	Increment if not equal.
CMR	Compare accumulator with specified contents.
CPR	Compare X with specified contents.
CPY	Compare Y with specified contents.
DEC	Decrement X by one.
DEY	Decrement Y by one.
INC	Increment X by one.
INY	Increment Y by one.
JMP	Jump to specified address.
JSR	Jump to subroutine and save return address.
LAR	Load accumulator with specified contents.
LDR	Load X with specified contents.
LDR	Load Y with specified contents.
LSR A	Shift right one bit of accumulator.
NOP	No operation.
PLA	Pop accumulator from stack.
PXA	Return from subsequence.
RCS	Return specified contents from accumulator.
RDR	Return X in memory.
RTY	Return Y in memory.
STX	Store X in accumulator value to X.
TAX	Transfer accumulator value to X.
TXA	Transfer value of X to accumulator.

304	Ship player horizontal coordinate.
305	Ship player vertical coordinate.
306	Allen 1 player horizontal coordinate.
307	Allen 1 player vertical coordinate.
308	Allen 1 player direction flag.
309	Allen 2 player horizontal coordinate.
310	Allen 2 player vertical coordinate.
311	Allen 2 player direction flag.
312	Allen 3 player horizontal coordinate.
313	Allen 3 player vertical coordinate.
314	Allen 3 player direction flag.
315	Ship missile fire flag: 1 = on screen 0 = off screen.
316	Ship missile vertical coordinate.
317	Allen 1 missile flag: 4 = on screen 0 = off screen.
318	Allen 1 missile vertical coordinate.
319	Allen 2 missile flag: 16 = on screen 0 = off screen.
320	Allen 2 missile vertical coordinate.
321	Allen 3 missile flag: 64 = on screen 0 = off screen.
322	Allen 3 missile vertical coordinate.
323	Score 0 register (initial explosion routine).
324	Score 7 register (initial explosion routine).
325	Number of lives left.
326	Score 11 (0x).
327	Score 12 (0x).
328	Score 13 (0x).

Label	Start address	Function
—	38978	Initialization.
clr	38980	CLEAR — Clears scores and performs further initialization routines.
cont.	38989	Controls order in which subroutines are executed.
del	38997	Delay 1000.
ship	38997	Controls movement of ship.
ali1	38997	Controls movement of alien 1.
ali2	38997	Controls movement of alien 2.
ali3	38997	Controls movement of alien 3.
fire	38997	Detects press of fire button and controls movement of ship missile.
missile	38997	Controls movement of alien missile.
coll	38997	Detects if space ship is hit.
kill	40734	Detects if aliens are hit.

Figure 17: Subroutine 0049

labels and a brief description of what each subroutine does.

Figure 18 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.

INITIALIZATION

Lines 180 and 190 initialize the game.

180

ORG 38978 calls the RMM assembler where to start storing machine code in memory. 85 is stored at address 53260. This sets the size of all missiles to double normal size. 144 is stored at address 54278 to tell the PM system that the PM base address is 38984.

All the data for the PM shapes are stored from 38984 onwards. 3 is stored in address 53277 to turn on the PM system. 62 is stored at address 538 to give single line resolution PMs on a normal size playfield.

190

16 is stored in the score places 1847.

20	Clock.
77	Attract mode clock.
508	Affects size of playfield and PM resolution.
632	Detects position of joystick 2 similar to STICK2.
640	Detects if fire button has been pressed similar to STRIG0.
704	Colour register of ship.
705	Colour register of alien 1.
706	Colour register of alien 2.
707	Colour register of alien 3.
716	Colour register of weapon background.
24840-24879	Top row of screen display.
38884	PM base address. This address is discarded by the program. Other programs using the PM system may use a different PM base address.
37632-39688	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.
53780	Pitch sound channel 0.
53781	Volume sound channel 0.
53782	Pitch sound channel 1.
53783	Volume sound channel 1.
53784	Affects word clinking and flaring. Causes white noise explosion sound.

Figure 18: Operating system addresses used by Alien Attack

1648, 1649 to put the character zero in these scores. A value of 5 is stored in address 1648 which holds the number of lives left. To increase this number, a higher one can be stored at 1648. 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 260 perform further initialization functions and clear many of the scores 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 (38978). 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. This is put into the Alien 1 and 2 scores 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 enter the unrequired 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.

238

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

239

Another loop clears all the Pfd 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 + 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 debugging 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 Module-2/ST, the only Module-2 compiler for the Atari 520ST. Accessed through Atari GEM icons, and driven by mouse, icons or keyboard input.

TDI Module-2/ST

£99.95

The package: TDI Module-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 Module-2/ST. GEM software can be developed with windows, mice, menus and graphics.

Advanced user friendly language: TDI Module-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) 742798

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 Module-2/ST

Please tick credit card type

VISA/Barclaycard

ACCES8

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 0GF.
Tel: (0509) 262259**



SEE OUR ADVERTISEMENT ON PAGE 31
FOR OTHER AMAZING ATARI DEALS



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.

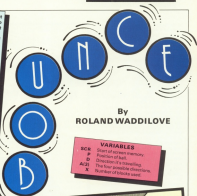
A ball rolls round the screen, bouncing off the walls. By pressing the fire button on your joystick, or any key, a block will be placed behind the ball.

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.

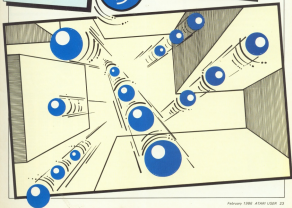
▲ Handy hint: Build traps for the ball, wait for it to bounce in, then place a block behind it so it can't get out.



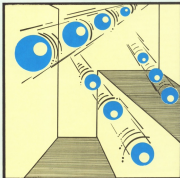
By
ROLAND WADDILOVE

VARIABLES

SCR	Start of screen memory
P	Position of ball
D	Direction it's travelling
A/21	The four possible directions
X	Number of blocks used



Game

[illegible][illegible][illegible][illegible]

日期		星期	天气	温度	湿度	风速	风向	气压	能见度	云量	降水	日照	蒸发	土壤湿度	土壤温度	植物生长	动物活动	人类活动	其他
1980年	1月1日	星期一	晴	5~10	65%	2.5	北风	1012	10	10	0.0	12	1.5	15%	5.0	正常	正常	正常	正常
1980年	1月2日	星期二	晴	6~11	68%	3.0	北风	1013	12	12	0.0	14	1.8	18%	5.2	正常	正常	正常	正常
1980年	1月3日	星期三	晴	7~12	70%	3.5	北风	1014	15	15	0.0	16	2.0	20%	5.5	正常	正常	正常	正常
1980年	1月4日	星期四	晴	8~13	72%	4.0	北风	1015	18	18	0.0	18	2.2	22%	5.8	正常	正常	正常	正常
1980年	1月5日	星期五	晴	9~14	75%	4.5	北风	1016	20	20	0.0	20	2.5	25%	6.0	正常	正常	正常	正常
1980年	1月6日	星期六	晴	10~15	78%	5.0	北风	1017	22	22	0.0	22	2.8	28%	6.2	正常	正常	正常	正常
1980年	1月7日	星期日	晴	11~16	80%	5.5	北风	1018	25	25	0.0	25	3.0	30%	6.5	正常	正常	正常	正常
1980年	1月8日	星期一	晴	12~17	82%	6.0	北风	1019	28	28	0.0	28	3.2	32%	6.8	正常	正常	正常	正常
1980年	1月9日	星期二	晴	13~18	85%	6.5	北风	1020	30	30	0.0	30	3.5	35%	7.0	正常	正常	正常	正常
1980年	1月10日	星期三	晴	14~19	88%	7.0	北风	1021	32	32	0.0	32	3.8	38%	7.2	正常	正常	正常	正常
1980年	1月11日	星期四	晴	15~20	90%	7.5	北风	1022	35	35	0.0	35	4.0	40%	7.5	正常	正常	正常	正常
1980年	1月12日	星期五	晴	16~21	92%	8.0	北风	1023	38	38	0.0	38	4.2	42%	7.8	正常	正常	正常	正常
1980年	1月13日	星期六	晴	17~22	95%	8.5	北风	1024	40	40	0.0	40	4.5	45%	8.0	正常	正常	正常	正常
1980年	1月14日	星期日	晴	18~23	98%	9.0	北风	1025	42	42	0.0	42	4.8	48%	8.2	正常	正常	正常	正常
1980年	1月15日	星期一	晴	19~24	100%	9.5	北风	1026	45	45	0.0	45	5.0	50%	8.5	正常	正常	正常	正常
1980年	1月16日	星期二	晴	20~25	100%	10.0	北风	1027	48	48	0.0	48	5.2	52%	8.8	正常	正常	正常	正常
1980年	1月17日	星期三	晴	21~26	100%	10.5	北风	1028	50	50	0.0	50	5.5	55%	9.0	正常	正常	正常	正常
1980年	1月18日	星期四	晴	22~27	100%	11.0	北风	1029	52	52	0.0	52	5.8	58%	9.2	正常	正常	正常	正常
1980年	1月19日	星期五	晴	23~28	100%	11.5	北风	1030	55	55	0.0	55	6.0	60%	9.5	正常	正常	正常	正常
1980年	1月20日	星期六	晴	24~29	100%	12.0	北风	1031	58	58	0.0	58	6.2	62%	9.8	正常	正常	正常	正常
1980年	1月21日	星期日	晴	25~30	100%	12.5	北风	1032	60	60	0.0	60	6.5	65%	10.0	正常	正常	正常	正常
1980年	1月22日	星期一	晴	26~31	100%	13.0	北风	1033	62	62	0.0	62	6.8	68%	10.2	正常	正常	正常	正常
1980年	1月23日	星期二	晴	27~32	100%	13.5	北风												



Tired of
tweaking?

Take advantage of your foreign currency

Display

[illegible][illegible][illegible]

1	0.00000	0	0.00000	10	0.00000
2	0.00000	0	0.00000	11	0.00000
3	0.00000	0	0.00000	12	0.00000
4	0.00000	0	0.00000	13	0.00000
5	0.00000	0	0.00000	14	0.00000
6	0.00000	0	0.00000	15	0.00000
7	0.00000	0	0.00000	16	0.00000
8	0.00000	0	0.00000	17	0.00000
9	0.00000	0	0.00000	18	0.00000
10	0.00000	0	0.00000	19	0.00000
11	0.00000	0	0.00000	20	0.00000
12	0.00000	0	0.00000	21	0.00000
13	0.00000	0	0.00000	22	0.00000
14	0.00000	0	0.00000	23	0.00000
15	0.00000	0	0.00000	24	0.00000
16	0.00000	0	0.00000	25	0.00000
17	0.00000	0	0.00000	26	0.00000
18	0.00000	0	0.00000	27	0.00000
19	0.00000	0	0.00000	28	0.00000
20	0.00000	0	0.00000	29	0.00000
21	0.00000	0	0.00000	30	0.00000
22	0.00000	0	0.00000	31	0.00000
23	0.00000	0	0.00000	32	0.00000
24	0.00000	0	0.00000	33	0.00000
25	0.00000	0	0.00000	34	0.00000
26	0.00000	0	0.00000	35	0.00000
27	0.00000	0	0.00000	36	0.00000
28	0.00000	0	0.00000	37	0.00000
29	0.00000	0	0.00000	38	0.00000
30	0.00000	0	0.00000	39	0.00000
31	0.00000	0	0.00000	40	0.00000
32	0.00000	0	0.00000	41	0.00000
33	0.00000	0	0.00000	42	0.00000
34	0.00000	0	0.00000	43	0.00000
35	0.00000	0	0.00000	44	0.00000
36	0.00000	0	0.00000	45	0.00000
37	0.00000	0	0.00000	46	0.00000
38	0.00000	0	0.00000	47	0.00000
39	0.00000	0	0.00000	48	0.00000
40	0.00000	0	0.00000	49	0.00000
41	0.00000	0	0.00000	50	0.00000
42	0.00000	0	0.00000	51	0.00000
43	0.00000	0	0.00000	52	0.00000
44	0.00000	0	0.00000	53	0.00000
45	0.00000	0	0.00000	54	0.00000
46	0.00000	0	0.00000	55	0.00000
47	0.00000	0	0.00000	56	0.00000
48	0.00000	0	0.00000	57	0.00000
49	0.00000	0	0.00000	58	0.00000
50	0.00000	0	0.00000	59	0.00000
51	0.00000	0	0.00000	60	0.00000
52	0.00000	0	0.00000	61	0.00000
53	0.00000	0	0.00000	62	0.00000
54	0.00000	0	0.00000	63	0.00000
55	0.00000	0	0.00000	64	0.00000
56	0.00000	0	0.00000	65	0.00000
57	0.00000	0	0.00000	66	0.00000
58	0.00000	0	0.00000	67	0.00000
59	0.00000	0	0.00000	68	0.00000
60	0.00000	0	0.00000	69	0.00000
61	0.00000	0	0.00000	70	0.00000
62	0.00000	0	0.00000	71	0.00000
63	0.00000	0	0.00000	72	0.00000
64	0.00000	0	0.00000	73	0.00000
65	0.00000	0	0.00000	74	0.00000
66	0.00000	0	0.00000	75	0.00000
67	0.00000	0	0.00000	76	0.00000
68	0.00000	0	0.00000	77	0.00000
69	0.00000	0	0.00000	78	0.00000
70	0.00000	0	0.00000	79	0.00000
71	0.00000	0	0.00000	80	0.00000
72	0.00000	0	0.00000	81	0.00000
73	0.00000	0	0.00000	82	0.00000
74	0.00000	0	0.00000	83	0.00000
75	0.00000	0	0.00000	84	0.00000
76	0.00000	0	0.00000	85	0.00000
77	0.00000	0	0.00000	86	0.00000
78	0.00000	0	0.00000	87	0.00000
79	0.00000	0	0.00000	88	0.00000
80	0.00000	0	0.00000	89	0.00000
81	0.00000	0	0.00000	90	0.00000
82	0.00000	0	0.00000	91	0.00000
83	0.00000	0	0.00000	92	0.00000
84	0.00000	0	0.00000	93	0.00000
85	0.00000	0	0.00000	94	0.00000
86	0.00000	0	0.00000	95	0.00000
87	0.00000	0	0.00000	96	0.00000
88	0.00000	0	0.00000	97	0.00000
89	0.00000	0	0.00000	98	0.00000
90	0.00000	0	0.00000	99	0.00000
91	0.00000	0	0.00000	100	0.00000
92	0.00000	0	0.00000	101	0.00000
93	0.00000	0	0.00000	102	0.00000
94	0.00000	0	0.00000	103	0.00000
95	0.00000	0	0.00000	104	0.00000
96	0.00000	0	0.00000	105	0.00000
97	0.00000	0	0.00000	106	0.00000
98	0.00000	0	0.00000	107	0.00000
99	0.00000	0	0.00000	108	0.00000
100	0.00000	0	0.00000	109	0.00000
101	0.00000	0	0.00000	110	0.00000
102	0.00000	0	0.00000	111	0.00000
103	0.00000	0	0.00000	112	0.00000
104	0.00000	0	0.00000	113	0.00000
105	0.00000	0	0.00000	114	0.00000
106	0.00000	0	0.00000	115	0.00000
107	0.00000	0	0.00000	116	0.00000
108	0.00000	0	0.00000	117	0.00000
109	0.00000	0	0.00000	118	0.00000
110	0.00000	0	0.00000	119	0.00000
111	0.00000	0	0.00000	120	0.00000
112	0.00000	0	0.00000	121	0.00000
113	0.00000	0	0.00000	122	0.00000
114	0.00000	0	0.00000	123	0.00000
115	0.00000	0	0.00000	124	0.00000
116	0.00000	0	0.00000	125	0.00000
117	0.00000	0	0.00000	126	0.00000
118	0.00000	0	0.00000	127	0.00000
119	0.00000	0	0.00000	128	0.00000
120	0.00000	0	0.00000	129	0.00000
121	0.00000	0	0.00000	130	0.00000
122	0.00000	0	0.00000	131	0.00000
123	0.00000	0	0.00000	132	0.00000
124	0.00000	0	0.00000	133	0.00000
125	0.00000	0	0.00000	134	0.00000
126	0.00000	0	0.00000	135	0.00000
127	0.00000	0	0.00000	136	0.00000
128	0.00000	0	0.00000	137	0.00000
129	0.00000	0	0.00000	138	0.00000
130	0.00000	0	0.00000	139	0.00000
131	0.00000	0	0.00000	140	0.00000
132	0.00000	0	0.00000	141	0.00000
133	0.00000	0	0.00000	142	0.00000
134	0.00000	0	0.00000	143	0.00000
135	0.00000	0	0.00000	144	0.00000
136	0.00000	0	0.00000	145	0.00000
137	0.00000	0	0.00000	146	0.00000
138	0.00000	0	0.00000	147	0.00000
139	0.00000	0	0.00000	148	0.00000
140	0.00000	0	0.00000	149	0.00000
141	0.00000	0	0.00000	150	0.00000
142	0.00000	0	0.00000	151	0.00000
143	0.00000	0	0.00000	152	0.00000
144	0.00000	0	0.00000	153	0.00000
145	0.00000	0	0.00000	154	0.00000
146	0.00000	0	0.00000	155	0.00000
147	0.00000	0	0.00000	156	0.00000
148	0.00000	0	0.00000	157	0.00000
149	0.00000	0	0.00000	158	0.00000
150	0.00000	0	0.00000	159	0.00000
151	0.00000	0	0.00000	160	0.00000
152	0.00000	0	0.00000	161	0.00000
153	0.00000	0	0.00000	162	0.00000
154	0.00000	0	0.00000	163	0.00000
155	0.00000	0	0.00000	164	0.00000
156	0.00000	0	0.00000	165	0.00000
157	0.00000	0	0.00000	166	0.00000
158	0.00000	0	0.00000	167	0.00000
159	0.00000	0	0.00000	168	0.00000
160	0.00000	0	0.00000	169	0.00000
161	0.00000	0	0.00000	170	0.00000
162	0.00000	0	0.00000	171	0.00000
163	0.00000	0	0.00000	172	0.00000
164	0.00000	0	0.00000	173	0.00000
165	0.00000	0	0.00000	174	0.00000
166	0.00000	0	0.00000	175	0.00000
167	0.00000	0	0.00000	176	0.00000
168	0.00000	0	0.00000	177	0.00000
169	0.00000	0	0.00000	178	0.00000
170	0.00000	0	0.00000	179	0.00000
171	0.00000	0	0.00000	180	0.00000
172	0.00000	0	0.00000	181	0.00000
173	0.00000	0	0.00000	182	0.00000
174	0.00000	0	0.00000	183	0.00000
175	0.00000	0	0.00000	184	0.00000
176	0.00000	0	0.00000	185	0.00000
177	0.00000	0	0.00000	186	0.00000
178	0.00000	0	0.00000	187	0.00000
179	0.00000	0	0.00000	188	0.00000
180	0.00000	0	0.00000	189	0.00000
181	0.00000	0	0.00000	190	0.00000
182	0.00000	0	0.00000	191	0.00000
183	0.00000	0	0.00000	192	0.00000
184	0.00000	0	0.00000	193	0.00000
185	0.00000	0	0.00000	194	0.00000
186	0.00000	0	0.00000	195	0.00000
187	0.00000	0	0.00000	196	0.00000
188	0.00000	0	0.00000	197	0.00000
189	0.00000	0	0.00000	198	0.00000
190	0.00000	0	0.00000	199	0.00000
191	0.00000	0	0.00000	200	0.00000
192	0.00000	0	0.00000	201	0.00000
193	0.00000	0	0.00000	202	0.00000
194	0.00000	0	0.00000	203	0.00000
195	0.00000	0	0.00000	204	0.00000
196	0.00000	0	0.00000	205	0.00000
197	0.00000	0	0.00000	206	0.00000
198	0.00000	0	0.00000	207	0.00000
199	0.00000	0	0.00000	208	0.00000
200	0.00000	0	0.00000	209	0.00000
201	0.00000	0	0.00000	210	0.00000
202	0.00000	0	0.00000	211	0.00000
203	0.00000	0	0.00000	212	0.0000



**Tired of
typing?**

Take advantage of our long-standing coffee shop. Open 24/7

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.
400-420	Get directory.
500-530	Load DOS format or cassette file.
600-630	Save DOS format or cassette file.
700-730	Load block of disc sectors.
800-810	Save block of disc sectors.
900-940	Full-screen routine.
940	Change to full screen display list to get until a key is pressed.
920	Cancel pressed key and switch back to split screen display list.
930	Back to get loop.
940	Back to routine cycle.
1000-1230	Read in Sector load/save routine.
1000-1008	Sector load/save routine cycle data.
1040-1140	Sector load/save routine.
1100	Read in file load/save routine.
1210-1230	File load/save routine cycle 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 list.
3000	Start with graphics mode B = 16.
3010	Use a string DLS for second display list. First address of start of DLS.
3020	Switch to display to speed up.
3030	Print start of original display list.
3040-3100	Change original display list from Graphics B to 16. This allows the program to run on the 400-800 which do not support graphics Mode 16 normally.
3110	First start of screen memory beam for bank display list.
3120	Copy original display list to DLS.
3130	Make two changes to DLS to tell display list where it starts.
3140	Having created first display list screen with graphics B larger text window.
3140-3190	Convert to graphics 16.
5000	Enter handling routine.

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

Program 1 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 1 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 2 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 2 you will be asked for the start sector. This will tell the program which disc sector to start loading from.

The first 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 800.

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

Graphics

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 3 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

AB	Used to get command input and also file names.
DLB	Being used to hold second (full screen) display list.
DL	Start of full screen display list.
DLH	Low byte of this.
DLH	High byte of this.
DLST	Start of graphics screen display list.
DLH	Low byte of this.
DLH	High byte of this.
START	Sector to start from.
SECT	Address of sector memory.
NO	Number of sectors to load.

Program II is a short Basic program to set up and load a microprinter 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 ran will ask for a filename. These can be D-filename or disc or C for cassette. It will then load and display the picture.

9999

DATASCAPE ATARI SOFTWARE SPECIALISTS

9999

EEEE! Special discount prices

UTILITIES

Megafast II	24.95
Page Designer	24.95
Slide (Share)	24.95
Truetype	24.95
Graphics Art Dept.	24.95
Article Comp. III	24.95
Print Shop	24.95
Bank B. M. Writer	24.95
Super Report	24.95
Formmaster	24.95
U.S. Doubler	24.95
Symbol II	24.95
Real Time Desk	24.95
File Connection	24.95

CARTRIDGES

Robotron	12.95
Mr. Pommel	12.95
Pommel	8.95
Centipede	8.95
IC-Quest	8.95
On the Border	8.95
Beauty Ball	24.95
Miss Defender	7.95

ALL NEW BAND INFOCOM TITLES IN STOCK! SALE NOW! NEW LOW PRICES

ALL US 4840, 4850, 4860, 4870, 4880, 4890, 4900, 4910, 4920, 4930, 4940, 4950, 4960, 4970, 4980, 4990, 5000, 5010, 5020, 5030, 5040, 5050, 5060, 5070, 5080, 5090, 5100, 5110, 5120, 5130, 5140, 5150, 5160, 5170, 5180, 5190, 5200, 5210, 5220, 5230, 5240, 5250, 5260, 5270, 5280, 5290, 5300, 5310, 5320, 5330, 5340, 5350, 5360, 5370, 5380, 5390, 5400, 5410, 5420, 5430, 5440, 5450, 5460, 5470, 5480, 5490, 5500, 5510, 5520, 5530, 5540, 5550, 5560, 5570, 5580, 5590, 5600, 5610, 5620, 5630, 5640, 5650, 5660, 5670, 5680, 5690, 5700, 5710, 5720, 5730, 5740, 5750, 5760, 5770, 5780, 5790, 5800, 5810, 5820, 5830, 5840, 5850, 5860, 5870, 5880, 5890, 5900, 5910, 5920, 5930, 5940, 5950, 5960, 5970, 5980, 5990, 6000, 6010, 6020, 6030, 6040, 6050, 6060, 6070, 6080, 6090, 6100, 6110, 6120, 6130, 6140, 6150, 6160, 6170, 6180, 6190, 6200, 6210, 6220, 6230, 6240, 6250, 6260, 6270, 6280, 6290, 6300, 6310, 6320, 6330, 6340, 6350, 6360, 6370, 6380, 6390, 6400, 6410, 6420, 6430, 6440, 6450, 6460, 6470, 6480, 6490, 6500, 6510, 6520, 6530, 6540, 6550, 6560, 6570, 6580, 6590, 6600, 6610, 6620, 6630, 6640, 6650, 6660, 6670, 6680, 6690, 6700, 6710, 6720, 6730, 6740, 6750, 6760, 6770, 6780, 6790, 6800, 6810, 6820, 6830, 6840, 6850, 6860, 6870, 6880, 6890, 6900, 6910, 6920, 6930, 6940, 6950, 6960, 6970, 6980, 6990, 7000, 7010, 7020, 7030, 7040, 7050, 7060, 7070, 7080, 7090, 7100, 7110, 7120, 7130, 7140, 7150, 7160, 7170, 7180, 7190, 7200, 7210, 7220, 7230, 7240, 7250, 7260, 7270, 7280, 7290, 7300, 7310, 7320, 7330, 7340, 7350, 7360, 7370, 7380, 7390, 7400, 7410, 7420, 7430, 7440, 7450, 7460, 7470, 7480, 7490, 7500, 7510, 7520, 7530, 7540, 7550, 7560, 7570, 7580, 7590, 7600, 7610, 7620, 7630, 7640, 7650, 7660, 7670, 7680, 7690, 7700, 7710, 7720, 7730, 7740, 7750, 7760, 7770, 7780, 7790, 7800, 7810, 7820, 7830, 7840, 7850, 7860, 7870, 7880, 7890, 7900, 7910, 7920, 7930, 7940, 7950, 7960, 7970, 7980, 7990, 8000, 8010, 8020, 8030, 8040, 8050, 8060, 8070, 8080, 8090, 8100, 8110, 8120, 8130, 8140, 8150, 8160, 8170, 8180, 8190, 8200, 8210, 8220, 8230, 8240, 8250, 8260, 8270, 8280, 8290, 8300, 8310, 8320, 8330, 8340, 8350, 8360, 8370, 8380, 8390, 8400, 8410, 8420, 8430, 8440, 8450, 8460, 8470, 8480, 8490, 8500, 8510, 8520, 8530, 8540, 8550, 8560, 8570, 8580, 8590, 8600, 8610, 8620, 8630, 8640, 8650, 8660, 8670, 8680, 8690, 8700, 8710, 8720, 8730, 8740, 8750, 8760, 8770, 8780, 8790, 8800, 8810, 8820, 8830, 8840, 8850, 8860, 8870, 8880, 8890, 8900, 8910, 8920, 8930, 8940, 8950, 8960, 8970, 8980, 8990, 9000, 9010, 9020, 9030, 9040, 9050, 9060, 9070, 9080, 9090, 9100, 9110, 9120, 9130, 9140, 9150, 9160, 9170, 9180, 9190, 9200, 9210, 9220, 9230, 9240, 9250, 9260, 9270, 9280, 9290, 9300, 9310, 9320, 9330, 9340, 9350, 9360, 9370, 9380, 9390, 9400, 9410, 9420, 9430, 9440, 9450, 9460, 9470, 9480, 9490, 9500, 9510, 9520, 9530, 9540, 9550, 9560, 9570, 9580, 9590, 9600, 9610, 9620, 9630, 9640, 9650, 9660, 9670, 9680, 9690, 9700, 9710, 9720, 9730, 9740, 9750, 9760, 9770, 9780, 9790, 9800, 9810, 9820, 9830, 9840, 9850, 9860, 9870, 9880, 9890, 9900, 9910, 9920, 9930, 9940, 9950, 9960, 9970, 9980, 9990, 10000

ADVENTURES

Mask of the Sun	12.95
Serpent's Eye	12.95
Wizard's Progress	12.95
Dark Crystal	12.95
Ultima II	12.95
Ultima III	12.95
Ultima IV	12.95
Ultima V	12.95
Ultima VI	12.95
Ultima VII	12.95
Ultima VIII	12.95
Ultima IX	12.95
Ultima X	12.95
Ultima XI	12.95
Ultima XII	12.95
Ultima XIII	12.95
Ultima XIV	12.95
Ultima XV	12.95
Ultima XVI	12.95
Ultima XVII	12.95
Ultima XVIII	12.95
Ultima XIX	12.95
Ultima XX	12.95
Ultima XXI	12.95
Ultima XXII	12.95
Ultima XXIII	12.95
Ultima XXIV	12.95
Ultima XXV	12.95
Ultima XXVI	12.95
Ultima XXVII	12.95
Ultima XXVIII	12.95
Ultima XXIX	12.95
Ultima XXX	12.95
Ultima XXXI	12.95
Ultima XXXII	12.95
Ultima XXXIII	12.95
Ultima XXXIV	12.95
Ultima XXXV	12.95
Ultima XXXVI	12.95
Ultima XXXVII	12.95
Ultima XXXVIII	12.95
Ultima XXXIX	12.95
Ultima XL	12.95
Ultima XLI	12.95
Ultima XLII	12.95
Ultima XLIII	12.95
Ultima XLIV	12.95
Ultima XLV	12.95
Ultima XLVI	12.95
Ultima XLVII	12.95
Ultima XLVIII	12.95
Ultima XLIX	12.95
Ultima L	12.95
Ultima LI	12.95
Ultima LII	12.95
Ultima LIII	12.95
Ultima LIV	12.95
Ultima LV	12.95
Ultima LVI	12.95
Ultima LVII	12.95
Ultima LVIII	12.95
Ultima LIX	12.95
Ultima LX	12.95
Ultima LXI	12.95
Ultima LXII	12.95
Ultima LXIII	12.95
Ultima LXIV	12.95
Ultima LXV	12.95
Ultima LXVI	12.95
Ultima LXVII	12.95
Ultima LXVIII	12.95
Ultima LXIX	12.95
Ultima LXX	12.95
Ultima LXXI	12.95
Ultima LXXII	12.95
Ultima LXXIII	12.95
Ultima LXXIV	12.95
Ultima LXXV	12.95
Ultima LXXVI	12.95
Ultima LXXVII	12.95
Ultima LXXVIII	12.95
Ultima LXXIX	12.95
Ultima LXXX	12.95
Ultima LXXXI	12.95
Ultima LXXXII	12.95
Ultima LXXXIII	12.95
Ultima LXXXIV	12.95
Ultima LXXXV	12.95
Ultima LXXXVI	12.95
Ultima LXXXVII	12.95
Ultima LXXXVIII	12.95
Ultima LXXXIX	12.95
Ultima LXXXX	12.95
Ultima LXXXXI	12.95
Ultima LXXXXII	12.95
Ultima LXXXXIII	12.95
Ultima LXXXXIV	12.95
Ultima LXXXXV	12.95
Ultima LXXXXVI	12.95
Ultima LXXXXVII	12.95
Ultima LXXXXVIII	12.95
Ultima LXXXXIX	12.95
Ultima LXXXXX	12.95
Ultima LXXXXXI	12.95
Ultima LXXXXXII	12.95
Ultima LXXXXXIII	12.95
Ultima LXXXXXIV	12.95
Ultima LXXXXXV	12.95
Ultima LXXXXXVI	12.95
Ultima LXXXXXVII	12.95
Ultima LXXXXXVIII	12.95
Ultima LXXXXXIX	12.95
Ultima LXXXXXX	12.95
Ultima LXXXXXXI	12.95
Ultima LXXXXXXII	12.95
Ultima LXXXXXXIII	12.95
Ultima LXXXXXXIV	12.95
Ultima LXXXXXXV	12.95
Ultima LXXXXXXVI	12.95
Ultima LXXXXXXVII	12.95
Ultima LXXXXXXVIII	12.95
Ultima LXXXXXXIX	12.95
Ultima LXXXXXXX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95
Ultima LXXXXXXXV	12.95
Ultima LXXXXXXXVI	12.95
Ultima LXXXXXXXVII	12.95
Ultima LXXXXXXXVIII	12.95
Ultima LXXXXXXXIX	12.95
Ultima LXXXXXXXI	12.95
Ultima LXXXXXXXII	12.95
Ultima LXXXXXXXIII	12.95
Ultima LXXXXXXXIV	12.95

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 88000 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 8PZ, UK.
TELEPHONE: BRISTOL (0272) 428781

In the USA, call 1-800-252-6382

Lattice is a trademark of LATTICE INC. MCCOMCO is a trademark of METACOMCO LIMITED. Other names may be trademarks of their respective owners. Prices include VAT and postage wherever applicable. Delivery times up to 2 weeks.

PHONE TODAY, OR POST THIS COUPON TO: METACOMCO, 26 PORTLAND SQUARE, BRISTOL BS2 8PZ.

PLEASE SEND ME:

MACRO ASSEMBLER £49.95

FOR THE ST/MS ST

MCC PASCAL £89.95

FOR THE ST/MS ST

LATTICE C £99.95

FOR THE ST/MS ST

MORE INFORMATION

☐

I ENCLOSE A CHEQUE FOR £

OR CREDIT

☐

MY ACCESS/VISA NO.

☐

CARD EXPIRY DATE

☐

NAME

☐

ADDRESS

SIGNATURE

POSTCODE

TEL. NO.

Keywords: child sexual abuse; disclosure; self-blame; social support

NEW!
Low cost
home computers
now available

Computart

Price Deals



Best Price for

ATARI HARDWARE

In the U.K.



Atari 1000 Computer

£119 1000 1000

Atari 1000 Disk Drive
(with FREE Home File Manager, Payoff
Adventure, Bombs/Disk & 10 FREE
Blank Disks)

£129 1000 1000

Atari 1001 Letter Quality
Printer (with FREE Atari Printer)

£145 1000 1000

Atari 1000, 1000Disk Drive
& 1001 Letter Quality Printer
(with FREE Home File Manager, Payoff
Adventure, Bombs/Disk, Atari Printer
& 10 Blank Disks)

£350 1000 1000

Home computers, software and accessories are available in the U.K. only. Prices are subject to change without notice. All prices are in pounds sterling.

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

Planned development in
Computart (Europe)
11 Cavendish Road, Longmeadow
Leeds LS2 9JF

Best Prices for

BLANK DISKS

in the U.K.

Top Quality 5 1/4" Soft Plastic Disks
Made in England and available throughout the U.K. (Minimum 1000)

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

FREE!! Perspex Disk Storage Box worth
£30 when you buy 50 Disks

10 - 5 1/4" Single Sided Double Density
Blank Disks (with FREE case) £9 1000 1000

10 - 5 1/4" Double Sided Double Density
Blank Disks (with FREE case) £13 1000 1000

10 - 5 1/4" Single Sided Double Density
Blank Disks (with FREE case) £49 1000 1000

10 - 5 1/4" Double Sided Double Density
Blank Disks (with FREE case) £69 1000 1000

Home computers, software and accessories are available in the U.K. only. Prices are subject to change without notice. All prices are in pounds sterling.



BRATTACAS

THE INTERACTIVE VIDEO - AVAILABLE NOW

Brattacas engineers like no other software already described as the product that broke the result, it is the ultimate software experience. Take the challenge, become Krue like earth scientist, discover the secrets of the solar system, struggle to survive in the hostile environment, above all prove your innocence.

Brattacas an innovation, an incredible concept, other products pale into insignificance.

BE PART OF THE BRATTACAS EXPERIENCE

Brattacas - Designed for the SCIBET, 800k Araya and 512k Masterdisk, compatible with colour and black & white monitors.

Original poster by Roger Dean included. Available now for £24.95 inc. VAT and p&h. Allow 7 days for delivery. Europe add £1.50 for postage.

Don't miss out on this unique Ltd. for Film, Part of European Holdings, the best, Europe's 1st in these such as: copies of Brattacas for my ☐ Atari 500B ☐ Commodore Amiga ☐ Apple II/IIx. Please send my Address/Postcode (write in letters)

First Name Surname

I prefer Cheque/PG for £

Name

Address

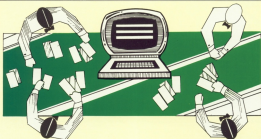
Postcode

SUPERFAST CREDIT CARD SALES LINE



051-227 4800





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 18K.

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 simultaneously 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, 3 for East, 2 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. 'Cuebys' (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

BRIDGE

By JOHN HOOPER

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	12-16 points, with a five-card suit in the bid suit.
1NT	12-16 points, but with no five-card suit.
2C	12-15 points, with clubs as the five-card suit.
2D, 2H, 2S	20+ points, with a five-card suit in the bid suit.
3NT	30+ 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 12-16 points – Jump response to 2 'something'. If you have a five-card suit, the 'something' should be that suit, otherwise NT.
- More than 16 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 four 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 'stair' bidding.

After 3D, 3H, 3S, 3NT

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, 3D-3H.

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

After 1C, 3D, 3H, 3S are opened

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 partners suit, say, 3D-4D.

Bidding to slam. This can be tricky

(spend the punt). If you wish to bid to slam (6 or 7 'something'), signal this by bidding '4C'. The computer will probably assume you are asking for ases, and will respond:

- 4D-0 ases
- 4H-1 ace
- 4S-2 ace
- 4NT-3 ace
- 6C-4 ases

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 ases? 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 goal 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 'doubling' as an indication of strength. It will not double for penalty points.



PROGRAM DESCRIPTION

- 0-17** Define variables, arrays.
20-900 Random deal into array C(4,13). I.e. 4 hands with 13 cards.
- 900-1000** Subroutines for direct displays. Note the symbols for the suits. Also, on the first run through, C(0)=0, therefore only South's hand is displayed. After C(0) has been set to 1, other hands can be displayed.
- 1000-2310** Subroutine to evaluate hand strength. Each card is read in line 2010, and suit lengths (SL) and points (P) are calculated.
- 2300-3520** Subroutines for bidding: display, plus analysis of South's bid SL. Each time a bid is made, a value is assigned to B(0), and n is incremented. For example, if the opening bid is "Five", B(0)=1 is set to 50, and n increases to 2.
- 3500-4650** Main bidding control. Variable n is used to monitor the state of the bidding, so as to pass control to the rest of the program when bidding has finished. 2 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 minimum values to be given to find the bidding - SL(0)=2. This effectively determines the contract.
- 4600-7000** Responding bid control. The value previously given to B(0) is now seen to be of use. B(0)=2 is the strength of your partner's last bid. B(0)=1 is the strength of the opponent's intervening bid.
- 7000-8130** 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 trump, who has won the trick, and so on.
- 8000-8900** Choose subroutines to select either the highest or lowest card.
- 8000-8100** Journal routine. B(100) gets the card. The suit is given by the value of Q, which is dependent on the current row position.
- 8100-8500** Display routines for card play.
- 7500-7600** and
8900-8995 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.

```

0 DATA *****
1 DATA *** 000000 ***
2 DATA *** 40 0000 00000 ***
3 DATA *****
4 DATA *****
5 DATA 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 208
```


[illegible][illegible][illegible]

Tired of typing?

Take advantage of our finger-saving offer on Page 68.

```

# 编译选项: 使用 GCC 编译, 生成可执行文件
g++ main.cpp -std=c++11 -O2 -o main

# 运行程序
./main

```


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 *Ayckum* from Borengrey, 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 *Ayckum* is quite like is designed for the likes of you and I (and not before time for some of us where adventures 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 inmates trapped.

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

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

By Brillig

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 look 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 dormant under the guise 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 veridical 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. Lacking the *Opera House* is problematic however, as you then have to locate the Phantom's lair, and there is only one way back in.

Musician abounds in the game, especially if you try to act out the role, and the usual Bignose play on obvious veridical 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 £9.95 for the cassette and £9.95 the disc the game is excellent value.

Scott Liddle, among others, has



Fighter Pilot is right on target

If you've ever fantasized 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 F16 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 perisights 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.

It warned though, the enemy returns your fire, and it becomes a real struggle.

If you really want to live dangerously you can opt in crosswinds and air turbulence, not to mention a tilted 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 foot runways and various navigation bases, 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 - Locklok. 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, Microsoft 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 spent 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. Man is quite charming and seems well suited to the computer environment.

Mr. Man's hat game is a simple matching activity. Mr. Man 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 spot 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. Man set of programs from Microsoft 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 least the little fat men have a useful task to perform.

They might learn story books alone, although I doubt it.

Alan Coode

Stand by with the insecticide

IN *Axis Assassin* from Activision your task is to fight off an army of insects which quickly multiply and attack you in waves. It's an interesting vision of the well known arcade title *Tarantula*.

Each screen holds a 2D 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 Android sends out a Spinner to weave strands across the grid. With an unlimited amount of ammo you must try and see off the meemies sent after you by firing at them down the corridors.

They take the form of Hunters, Bombs, Spines and Assassins and each has an individual shade of black and its own point system. You have to try to destroy enough of the enemy to make the Master Android reappear.

When he does you can zap him with a pulse beam. 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 *Android* 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.

Honestly 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 Activision's Mid-Price series so the disc will only set you back £9.95, with the cassette costing £3 less.

David Andrews



The high price of war

It seems that every second computer wargame that arrives from the States now is labelled 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 Grenadier* 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 Garmen 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 Luthnessa*, is an ideal introduction for the novice player.

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

users adequately for beginners and experienced players alike.

SSI has moved away from the normal videogame 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 *Master Commander* 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 Mischin



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 Kingdoms of Zhal 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. *Zhal* weighs in at 73k but *West* is a smaller 48k. 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 this is spectacular is an understatement. They have to have been seen to be believed, leaving 8 bit screens very 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 initially I found it limited to two word entry.

The plot involves tracking down dark robbers and duly telling them, before taking the money they stole back to the town. During 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 careen 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 give *West* just to get used to their screen.

Zhal, 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 Ederick waits for you.

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

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

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

So far I have rapped 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.

Zhal 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 thinking waits a bit of mathematical 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 making a real headache. This does add a touch of reality, for you take your sense of direction in real maps too.

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

Zhal lasted for the review but *West* is. The combination makes a good starter pack for novice adventurers. It's quite a fair package for the average ST owner and is worth buying just for *Zhal*. With *West* included, at £24.95 it makes an attractive buy to anyone.

Joel Glover

P.F. SOFTWARE (Dept. AU)
14 BIRNSTALL AVENUE
LITTLEBOROUGH
LANCS. GU16 5JA



DEFECT AMERICAN REPORTS FROM OUR USA BRANCH
FOLLOW BOARD WITH SUBJECT, NORMAN SCHWARTZ
CONFIDENTIAL



100 University Road, Preston, Lancashire PR1 1BP
Tel: 07723 33392
Mail order: 07723 33338 - 10am-5pm
Business Hours: 07723 33388 - 9pm-11am
www.0772333338.com

SERIOUS BUSINESS OR SERIOUS HOBBY

Information about this and other interesting new books is available through <http://www.oxfordjournals.org>. For more information, contact the Oxford Journals Department, 100 Brook Hill Drive, West Nyack, NY 10994-2133, USA. Tel: +1 845 353 4500. Fax: +1 845 353 4501. Email: oxfordjournals@oxfordjournals.org

[illegible]

© 2006 Blackwell Publishing Ltd Journal of Internal Medicine 260: 379–387

different models ranging from 1980s to very recent leading brand names. Please try to replace your car with the best one you can choose. For more information on how to get the right model, please see the list of our other services (below).

K.E.C.M.

Abstract

© 2000 Blackwell Science Ltd, *Journal of Internal Medicine* 247: 395–402

**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 president.

Please reserve me a copy of *Star Line* magazine
every month until further notice.



☐ I contacted them if indicated by my answer

Abstract

State to management. After 1 year should be able to
know your local conditions, or contact Steve Fisher.
Presentation Manager on 0100 0000.



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 re-defined character sets require data tables. Custom graphics modes, DUs 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 area stays 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 16384 - are reserved for use by the operating system.

A 256 byte data buffer starts at 17982, 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 16384 to 17984. 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 (1024-1151) and the printer buffer (9495-9999).

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 POKE 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:

$$\text{SAVMSCL} = \text{PEEK}(88) \\ + 256 * \text{PEEK}(89)$$

If you POKE any number from 0 to 255 into this address it will be printed as an Ascii character at top left of the screen. If you select a different graphics mode, the address contained in SAVMSCL 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 (1026) 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 APPEND (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 600 bytes in the supposedly safe area, so watch out.

Changing HIMEM (141,142) 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 have 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

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 numeric data into Atari symbols, then type a program line with the symbols between double quotes:

```
10 DIM A$(10):A$="123456"
```

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 100 bytes.

Secondly some characters are hard to store in literal form: the numbers 34 (double quotes) and 133 (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$(10):B$=""
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 ADDR(A\$).

Backward 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$(2):A$="X"Y":
A$(2,1)=CHR$(34):PRINT A$
```

Control of atoms such as 128 (clear screen), 28 (cursor up) and 260 (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 768. CHR\$(128) 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 768,0 or

press Break to restore the control functions.

The only number that can never be printed as a screen character is 133 (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)):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 it, 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$(10)
20 FOR X=1 TO 8
30 READ B$(X):A$(X)=CHR$(B)
40 NEXT X
50 DATA 35,36,37,38,39,40
```

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 statements, then print it in literal form so that you can enter it as a program line. Try adding to the program above:

```
60 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

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 *Do It Yourself*.

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 ADDR function.

They can't be used to hold things

Programming

rather of converting to and from Atari-style symbols, and the entries can be changed easily without resorting 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 Atari-style 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 Atari-style symbols immediately after the REM statement. For example:

10 REM at @5%

will store the numbers 97, 33, 32, 64, 53 and 37. Note that any space after 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.

STMT#1 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

“Once settled into a finished program REM will stay in the same place”

length, statement length and the token for REM). So your data start at $PEEK(136) + 356 - PEEK(137) + 5$. You cannot place more than about 112 bytes in this way, and the technique is relatively cumbersome.

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
AMROG
APOLASOFT
BATTERIES INC
BIG FIVE
BRODERBUND
DATABYTE
DATAMOST
DATASOFT
DIGITAL INT
ENGLISH
FIRST STAR
FUNSOFT
GRENIN

ICD Inc
LEVEL 9
M.M.G.
MELBOURNE HOUSE
MICROPROSE
MINDSCAPE
NOVAGEN
OSS
PRECISION
SIERRA
SSI
SUBLOGIC
TRONIX
U.S. GOLD
XENIX

Source the best compact software for your ATARI game and visit our store now. OPEN 7 Days a week.

Open until 10pm.
CALL us on 0523 60400 (09) 05100

FREE CATALOGUE. Send a stamp with your name and address. Best order available.

FILM CITY VIDEO.
176 Chesterfield Road, Ashford, Middlesex.

MILES BETTER SOFTWARE

281 Canons Road, Chesham,
Chesham, Bucks. W911 2DD
Tel: (05495) 5817

ACTIVISION	£19.95	ACTIVISION	£19.95
ALPHA SYSTEMS	£19.95	ALPHA SYSTEMS	£19.95
AMROG	£19.95	AMROG	£19.95
APOLASOFT	£19.95	APOLASOFT	£19.95
BATTERIES INC	£19.95	BATTERIES INC	£19.95
BIG FIVE	£19.95	BIG FIVE	£19.95
BRODERBUND	£19.95	BRODERBUND	£19.95
DATABYTE	£19.95	DATABYTE	£19.95
DATAMOST	£19.95	DATAMOST	£19.95
DATASOFT	£19.95	DATASOFT	£19.95
DIGITAL INT	£19.95	DIGITAL INT	£19.95
ENGLISH	£19.95	ENGLISH	£19.95
FIRST STAR	£19.95	FIRST STAR	£19.95
FUNSOFT	£19.95	FUNSOFT	£19.95
GRENIN	£19.95	GRENIN	£19.95
ICD Inc	£19.95	ICD Inc	£19.95
LEVEL 9	£19.95	LEVEL 9	£19.95
M.M.G.	£19.95	M.M.G.	£19.95
MELBOURNE HOUSE	£19.95	MELBOURNE HOUSE	£19.95
MICROPROSE	£19.95	MICROPROSE	£19.95
MINDSCAPE	£19.95	MINDSCAPE	£19.95
NOVAGEN	£19.95	NOVAGEN	£19.95
OSS	£19.95	OSS	£19.95
PRECISION	£19.95	PRECISION	£19.95
SIERRA	£19.95	SIERRA	£19.95
SSI	£19.95	SSI	£19.95
SUBLOGIC	£19.95	SUBLOGIC	£19.95
TRONIX	£19.95	TRONIX	£19.95
U.S. GOLD	£19.95	U.S. GOLD	£19.95
XENIX	£19.95	XENIX	£19.95

Please provide the latest shipping address in this advertisement.
See 11.00 per day for contract orders. Post and Package is 10% in UK.
Please forward copy of Miles Computer.

All 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, 68 Chester Road, Hazel Grove, Stockport SN7 5NY.

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 wisely 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 RAW 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

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

fact it is – and therefore make it able to use both monitors.

The biggest problem with connecting 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 appropriate 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 Atari releases the full GEM word processor in the near future.

In the meantime, however, none 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 C – and using the printer's special capabilities such as underlined 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 'WY220.TXT' on your STWriter disc. Make a copy of the file on a 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

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 **Alt** once. The new directory will now be read in and will replace the old one on the screen.

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 codes 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.

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 Atari 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.



Come and see us at
THE ATARI COMPUTER SHOW
Newport Water, London
This is the 9th of March
Stand 52

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/SE and ST machines!

Subscription **£7.00**

(Europe £10.00 elsewhere £10.00)

Send to:

PAGE 6

PO BOX 54

STAFFORD

ST16 1DB

Tel: 0745 41153

Send £1.00 for a sample copy

Let's GET it right, VAL is not guilty

I NOTE that in Mike Brown's documentation for his Computer Countdown program in the December 1985 issue of Atari User, he reports that he found a bug while using the 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 subject is in fact the GET command. Bill Wilkinson, of Optimized Systems Software, identifies the problem in "The Atari Basic Source Book" from Computer Publications.

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

In Mike's program the subroutines at line 300 contain a GET (at line 370) followed by a VAL (at line 380).

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 DOST-MY=STRING or PRINTING

any number before executing the GET.

Either of these statements correctly resets the buffer pointer. Another solution is to use the statement R=GET(MYSTR+VAL+STRING) which effectively resets the buffer initialising routine in the floating point ROM package which GET uses.

Incidentally, CDCATE has similar problems, as this statement will GET:

The bug was present in Atari Basic Plus A (the original cartridge) but was corrected in the later B and C versions.

The version of Basic can be determined by PEELing location 43234. Rev A gives 102, Rev B gives 06 and Rev C gives 204.

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

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

It's all well and good to get 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 shops, Lanksy and Osborn can explain the situation?

Finally, congratulations on the continued publication of Atari User. I look forward to new series replacing the outstanding graphics and display art 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 parties 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, Birmingham.

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"

BASICs may or may not be well founded, we can't say at the moment.

Certainly some recently acquired BASICs 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 BASIC keyboard, but try as I may I can't produce the special character on line 5762 of your Commodore game in the January issue.

Just what is that first item of data? It's certainly given me the hump! — Greg Barton, Crawley, Sussex.

The offending character should be a 8, and once again we played innocence. The original artwork was perfect (at least) and the glitch occurred in the printing process.

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

Loading technique

I RECENTLY bought an Atari 8000, 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 repaired.

I still find that I cannot load any cassette, no matter how slowly 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 math look-up. Well, being a sufferer of this problem for about 17 months I was unconvinced about the guarantee coming out on my 8000X, 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 inevitably 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 get 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 "BEEP ERROR" and "MEMORY TEST" on the screen.

This happens with every one of my cassette cassettes and I am just about ready to smash the lot against the wall. I hope you can help me. — **Patrick McDonald, Lifford, 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 80081, 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

COMBIBOLATIONS on your magazine, particularly the business section.

I recently bought an 80081 and disc drive and I appreciate the monthly disc.

My first attempt at typing in a long program, Mike Munch said nearly all errors in debug fell 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 card I have heard nothing from Atari, whilst I gather it not arrived.

I would really like to contact a group, and particularly either one in the North Queens 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 Mac Nicholas, Blisworth Vale.**

■ We don't know of a user group in the North Queens area — perhaps one of our readers knows of one.

Reason for the error

I PYPED in the program Canvas on my Atari 80081, from your October magazine. When I tried to run the program it went to the graphics screen and printed "Error 8 on line 2000".

Please can you tell me what is wrong with the program? — **Robert Harvey, Cheadle, Cheshire.**

■ Guess what — you've made a typing error somewhere, probably between lines 2000 and 2100.

Books for beginners

I WOULD like to know if Dean are thinking of bringing out Atari 80081 and 8011. Expected, also could you recommend a good book for the beginner?

Could you please tell me if my 80081 is OK? I have saved a program a high pitched tone keeps going until I reset or press END. — **M. Fryer, Wincoburnfield.**

COULD you give me the rule 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 in 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 Teach Tablet as it does not say anything about it in the ad for the Atari User. — **Alan McGill, Middlesbrough.**

■ There is no problem if a machine carries on the high pitched tone after testing. Just hit Reset or type END — or use a SOUND statement — and it will go away.

The Teach Tablet comes as standard with the Atari-80081 cartridge, allowing you to test it to the full.

If you bought the package with the 1000 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 81 range.

There are dozens of books available, but you could do a lot worse than looking out the following titles:

The 81 Handbook (Century Publications) £8.95: A good book to take you from first steps up to some quite advanced topics.

Easy Programming for the Atari Micros (Shiva) £8.95: A similar book to the above, but covering less ground when it comes to the more advanced sections.

Your Atari Computer (Cheltenham McGraw Hill) £18.95: A superb book for someone who has perhaps mastered the very first steps, and wants an excellent to-the-point reference book with lots of information on all aspects of Atari programming. A must for the serious programmer.

Watsons Notes on the Atari (Clarendon Publications) £2.95 each: A series of six very reasonably priced books starting from first steps and moving eventually up to plots/masks graphics, etc.

The full range consists of:

- 1) First steps in Basic.
- 2) Expanding 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.A.J. Sumner

regarding *Tiger in the Snow*.

My first Atari dealer Graham, has this title for £14.95, that's the same price as the CAMEL and some £20 cheaper than Mr (or is it Ms) Sumner's latest bid!

I bought a copy myself and am very pleased with this excellent strategy game — Apple version one side of the Atari version the other. — **Mrs L. Prossidge, Reading.**

■ The game also appears in the latest *Silica Shop* list as a UK first 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 use them 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 files.

So give a thought for the future generations of computer users. — **Euphemia 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 *Possible Cases in Hollywood*, which told us how good the game was going to be when it was released in "Vase 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

All in the same boat...

version and it's great. Even the Spectrum version is very good.

Considering the Atari's superiority over other low machines the 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 words. — **A. Karyanayalparaman, Manchester.**

■ Our advice is to switch them lightly and serve in a white wine sauce.

Bridging the gap

I WOULD not where or to whom I should write to express my disappointment.

Last April I purchased a 1200F 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 help sellers, whereas bridge is one of the most popular games in the country with far more participants than chess.

Many hotels hold bridge tournaments throughout the year. Evening classes certainly in my area are over-subscribed.

Even the BBC has produced its own £200 computer dedicated to the game.

I would be grateful if you could help me with the right contacts. — **A.G. Forreay, Springfield.**

■ 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 immigrant to Canada for 13 years, I was most pleased to receive my first issue of

1986 were interested in read it. Whitaker'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 repairs, where one 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.

It is wrong to presume that the recommended repairs can mend a computer and we make many faults. A few 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 machines have failed it up! — **Mrs A.D. Hes, Ashford.**

On reading G. Whitaker's letter, I feel I must agree with him. I own a 800XZ, 1020 printer, 1200F monitor and touch table. Just recently I bought a 1050 disc drive.

On getting my newly acquired 1050 home tonight my horror on opening it up to find the 1050, leads and transformer there, and that was all.

I went back to Centre, who said that there should be manuals and a 003 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 MY Whitaker's case, silence or plain ignorance.

I think before Jack Travelle wrote about backing all existing tapes and new launches and the like, he should get his MS figure 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.

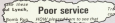
Over the years I have given to have Atari but recent events are making it hard for me to

re-evaluate and running education.

Being an Atari owner and dealing with Atari as present so that I can write my own programs for our students' machines, 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 salesman I write to Atari (US) 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



get excited about Atari's future prospects. — **J.B. Dray, London W19.**

YOU are right G. Whitaker of Jorwick, 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 1200F asking whether it was my machine at fault or whether it isn't compatible with my Philips PP — and I'm still waiting to see if it can be fixed. — **A. Seaward, Worcester.**

I WAS not surprised to read of G. Whitaker'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

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 as much as received a reply. In fact the other rudeness caused me to make 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 word areas in hospitals throughout the country. The hospital classroom is one foot in the clinic. — **Mrs Jackie Padden, Eggham, Gosport.**

Atari User, compliments of my English relatives.

I must say that and foremost what I do on a few magazines, I was most impressed with the layout. Your articles make excellent reading, and 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 site director and program coordinator for my local Atari group (ROCKY MOUNT Regional Atari Computer Enthusiasts).

I would like to correspond with my Atari user group in the UK or individuals who would like to exchange ideas and public domain programs with our group.

All present our membership is around 150 and growing. Our library consists of approximately 50 disks all public domain and FOD MACII files.

We would also like to trade new and interesting programs for the 800ST public domain.

Anyone or group can write to us care of myself at the address below. — Harold Warner, 2630 Redback 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 60 (old codger). I do know a younger man (20ish) who sells TVs and mirrors 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 "Fatal incompatibility" using DOS 2 or 3. However using Atari Writer I

ATARI Mailbag USER

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
Europe House
68 Charter House
Hazel Grove
Stockport SK7 5NT**

have been able to fix and enter the data, but giving DOS version used and DOS command (RAM) programs (BASIC), C-8000s made for the 400 and 800 models, when dealing into 85 models they stop after loading the first pass.

What happens is the first pass loads then the TV screen flashes and then crashes. To overcome this as soon as the TV flashes press Atari 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 (I cannot get on with it up for sale. — E.E. 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-Alt), then change the bits, 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 Graphics 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 copy-

ing 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 bad, try 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 RECENTLY an Atari 800X, a year ago last December and/or 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 four most of the main commands work, but there are still some fraser known ones which I have never seen before.

A fellow Atari user mentioned the XID command. He said it was used to fill stages 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 XID 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:

XID 20,10,1,0,70"

The 20 is the point which is needed for a fill operation — replace this with 12 and it performs a CLOS operation instead.

For an example of its use, see the Microscope program on page 50 of our November issue.

Directory reader

ATARI USERS, along with other magazines, often send 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:

DOS 00000000 0,0,0,0,0,0,0,0 0,0,0,0,0,0,0,0 0,0,0,0,0,0,0,0 0,0,0,0,0,0,0,0

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 list) which can be ignored.

If you have already used AJ in your program you will get Error 3, so leave out the DIM or do a CLR first. — P. Boulter, Twickenham.

Auto-boot tapes

I STARTED to load in the

Featured: From the October 1988 Atari User, but had to go for levels. So I decided to put what I had pointed out for on in a Atari User - a classic C78 computer cassette.

But after loading it, an error 128 message came up in the monitor.

I would like to know what an error 128 means and what I am doing wrong as I followed the instructions out of the Atari 1000 program recorder owner's guide. — **Gareth Lewis, Crowthorne.**

■ Error 128 is Device NAK, which doesn't mean quite what it sounds like! Basically, 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 (the light is 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 C84VE and press Return twice.

This should save the program, which can later be loaded back in using CLOED.

Cheaper RAM pack?

I AM the unfortunate owner of an Atari 8000L. I am unfortunate because I only bought the damn thing just over two years ago, before the 8000L was released, in the full anticipation that the promised expansion RAM pack would be available early in 1988.

I have not only seen the price of Atari shops in £795 for Atari 8000L with also above the Atari 8000L cheaper without a trace.

So I am now fully resigned to leaving the Atari name and changing, dare 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 8000L expansion RAM pack?

Or better still, come on Jack, let's have a RAM pack offer with the software for 800 or less to show those who

had faith in Atari when in the doldrums that it was not misplaced. — **J.B. Gicourt, Bideford.**

More on utilities

CONGRATULATIONS! For the first time that I can remember you have reviewed a utility. In Stephen Donoghue's excellent Atari article on Basic XL (December 1988).

Of course, as with other Atari software, the sting comes in the tail with the usual maintenance price, "£75 or so". But then it *isn't* Atari, or the software house's, nor Mr Donoghue's.

We normally get reviews of New games in Atari User, but in the 1988 December issue we had no less than 14 games reviewed, if you count *Wing's* Advertising utility.

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 letters divide your software reviews equally between games and the non-games software?

Basically, like me, haven't a clue which non-games software is worth looking at. Most of them are just names

in 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 list of your advertisements to see just how MUCH information is provided — and of course, they are listed. We do need impartial reviews on non-games software, please.

Perhaps Just Travel & 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 8000L 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 worse to that effect.

This is simply not good enough — they should stop advertising this service if they cannot provide it.

With production of the 8000L now winding to an end, I hope that Atari User will still cater for the 8000L, games 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, readers will want to offer worthwhile cash-in plans 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 discount for the 8000L like the one for the 1300XL?

And wishes — keep up the good work, Atari User is improving all the time. — **C.H. Tisdale, Wokingham.**

■ 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 8000L — see Page 51.

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 705899 or at the address below. — **J.P. Nelson, 16 Springfield Close, Dringhouses, York YO2 2TG.**

Not - so - smashing hits

I HAVE a problem with *Demash* this volume 1. It has recently decided that it is not the original version and when it boots it cannot get past the stage where it searches for its host sector.

I have a feeling that it is my old 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 abbreviated) version of *Parman*. It involves you running around the church collecting up the hymn books after the service.

The game makes up the maze and devil-shaped

characters chase you around the screen. Of course there were subtle alterations around the maze so you could chase the devil away with surprise.

The first time I typed my program into my Atari 800 I looked up just as I typed in the *SAVE* command — it looked 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 in my computer usually saved 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, Ipswich.**

■ You could have a drive speed problem — in which case have the drive tested by an engineer. It should be 288.6 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.



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 £5.00 on disc

(RRP £8.95)

(RRP £12.95)

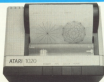
(Purchasable at this special price with a subscription.)

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 (1984-present) Fulfilled Jack's financial purpose of the new machines, Black Knight, Squid, Advertising, Alphabet Train, Chess skills, Software system, Storage, the 100% Microscope, Air Imagery - the Blue, Diagrams and Graphics.

Topic Areas: Analysis of the LORR, Informative Advertising, Randomness tests, Software reviews, Free Jump, Message, Records, Next Images - No Film, Beginners and Diagrams (special) to new features on Communication.

[illegible]

Report Issues: Analysis of KORE program provides readers, Frank Costello, Providence, South Tabor gas plant, 500 feet at Laga, Bader 1997. See 2.2 upgrade offer. Chapter, Lee Talmid, Mowbray, Software review. Images - Sir Nils, Ragners and Gerd.

September Issues: 51 pages spread on the 10/10/10. Starts 11 weeks (longer) earlier.
More Months: 1 Year More, 10 Days Less
 Total: 10/10/10 (10/10/10) 10/10/10

generating with Logo, Holman reviews insights on the Web, Mathematics and Science.

Desktop issue: Computer Canvas graphics program, Updates for IBM 6000 modules, 10000 Remstar unit, Hirschmann graphics utility, Fortran Software version, 60000 operating environment, Mapping, Image - B. (Mac, Repertoire and Graphics)

Microsoft (cont.) Learning program, Windows operation skills, NT graphics examples, NT software: Int. Clay Finkler joins, Display List tutorial, Advancing Windows, Software review, Insights - In Blue, Reviews and Comments.

December issue: Char's new program, Special keyboard characters, How to review, ElmWare and Claridian, Countdown game, Easi, Copying, Lint tutorial, Software reviews, Left-handed people, Advertising, Register, and Games.

January 1988 issue: Modified code games, Pt. 1. Read in education. New 3D location games. Horrific games. Check new updates. Listing silly. Entertainers guide. 1620 screen dump routine programming in C on the AT. Adventure. Software review.

£1.25



Keying in long programs too much of a chore?

HAFT Alphabet Series: The combination of action sound and animation makes this early learning game a winner with the children. **Soundz Introducing:** From your neighborhood pet, with three ready-made words. **Wings:** Birds, ships, and sea machines make progress with this fundamental lesson. **Attack Squads:** A fast-action game to keep you on your toes. **Shooting Trainers:** Hit from far your reactions really are. **Ministry Crossover:** dramatic moments to inspire, motivate.

JPFA: Pump Damage Fluids entering pump can be reduced
 more by the pump or the contents of the pump. Some

1999SA Rain Power I bet the extra bits of inventory to good effect, or use the drawing machine to produce some pretty displays. **Subcompact:** Seattle: the information. **Edco-Match** (See pretty pictures with color is possible. **Random Systems:** Can produce random numbers from random code. **FilePro:** Can give users the ability. **FilePro System** is 100% safe.

R.I.Y. Bomb Film: Flame the decorated city, and local ally **Demarcus** finds out what's going on deep inside your town. **Paranoid Heart:** Use logic withholding to find the answers. **Paranoid Generation:** Deep-generating paranoia will give you that new idea. **Keywords:** Connect your movie with an image. **Characterize:** Can you without the main of topics in the world?

BIG DATA *Assembly:* Rules for how code programs may access *Storage:* *Analytics:* Store memory with virtual flow from production. *Workloads:* Monitor systems work.

Then give your fingers a rest by sending for our monthly disc or cassette containing all the programs from each issue of *Altos User*. See order form inside.



43 of 43



Display Link Demonstration program. **Hitler FWD** - Political and religious Touch-Tone Demonstration program.

SUPPLIES: Many Months, Help Monitor the Web Search for Cheap Computer Hardware, Data Makers Control your machine code routines in DATA statements, Display Link Demonstration programs, Screen Dumpers, Dump your Hard Disk contents in KERNAL mode, Rotate Video the Video screen.

CGI/HTML: Passwords, Ties! Best Memory Design
 Courses training in how and when Display Lists
 and multiple programs. **Wings Pro: Animate** graphics
 on two planes. **Computer Camera** Make your
 own image-realistic. **Accelerator Update** Important
 details for the 100% acceleration. **RAM Drive** Make the
 most of the 100% RAM memory.

SEVERELY—Gay Families Help Gay escape from the guards. **Concave**—Touch your Arm to be a psychiatrist. **Display**—Link Demonstration program. **Hilary**—Operations—Unity to provide legal assistance. **Chloe**—Crisis center. **Shirley**—

[illegible][illegible]

FIBERGLASS: Home: Play Knight's new program. **Microspainter:** Programs to microspaint Microspainter screens. **Click:** Inexpensive screen click utility. **Flanker:** Flanking vulnerability. **Removal:** Simple to play, harder to master. **Setback:** The thinking person's computer. **Pha:** Flanker of the month. **Bummer's Last** - an adventure novel. ©1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653

FREE

Can you escape from the Demon's Lair, this month's *horrors*? It's an adventure game with enough red herrings to start a fish dinner.

And remember, you won't find it listed in the magazine - it's only available if you buy the monthly cassette or other.

These parties have responsibility

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 magazine, firmly secured in place with metal rods.



only
£3.95

Double your disc capacity

Allow your Atari to act as 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 ensure pinpoint accuracy!

Order now and we'll also send you an Atari disc containing DOS 2.5 absolutely free of charge!



£9.95

**DISK
DOUBLER**

All prices include postage, packing and VAT.
Overseas orders despatched by Air mail.

Valid to Feb 28, 1986

Please enter number required in box (1-7) E 8

Annual subscription

UK & EIRE £10 (including postage) 9049
Europe £15 7982
Overseas (Air mail) £20 7986

Commence with: 8028

Add £3.00 (post) to all orders to your subscription to ensure fortnightly 7980
Date? 7982

*Only available if received by subscription order.

Back issues

May 1985	7980
June 1985	7981
July 1985	7982
Aug 1985	7983
Sept 1985	7984
Oct 1985	7985
Nov 1985	7986
Dec 1985	7987

Monthly Cassette/Disc

Cassette	Disc	Price	Disc
May 1985	7987	7988	
June 1985	7989	7990	
July 1985	7991	7992	
Aug 1985	7993	7994	
Sept 1985	7995	7996	
Oct 1985	7997	7998	
Nov 1985	7999	8000	
Dec 1985	8001	8002	
Jan 1986	8003	8004	
Feb 1986	8005	8006	

T-Shirt

Small	7947
Medium	7948
Large	7949

Dust Cover

130XE UK	7981
800XL Europe and Overseas	7982

Binder

£3.95 UK	7979
£5.95 Europe	Overseas (Air mail) £9.95

Disk Doubler + free DOS 2.5

£9.95 UK & Overseas	7983
---------------------	------

1020 Printer/Plotter

UK only	7975/76
---------	---------

Learning is Fun

Tape/Tutor	Topic	7995
	Disc	7996
Simulated Computer	Topic	7997
	Disc	7998
Basic Games	Topic	7999
	Disc	8000

Overseas orders - add £2.00 per order

Payments please indicate method (1-7)

☐ Access, Mastercard and Eurocard

☐ Bank Giro ☐ Bank Transfer ☐ Bank of America ☐ Bank of Canada

☐ Bank of France ☐ Bank of Germany ☐ Bank of Italy ☐ Bank of Japan

☐ Bank of Spain ☐ Bank of Sweden ☐ Bank of Switzerland ☐ Bank of the Netherlands

☐ Bank of the United Kingdom ☐ Bank of the United States ☐ Bank of the United States

☐ Check/PO made payable to Database Publications Ltd Credit card expiry date / /

Name _____

Address _____

City _____

Postcode _____

Signature _____

Sent to: Atari User, FREEPOST, Europa House,

48 Chatter Road, Huddersfield, West Yorkshire HU1 1NY

(No stamp needed if posted in UK) Please allow 10 days for delivery

Orders by phone 061 488 0475

- by credit card 061 488 0475

- by cheque/PO 061 488 0475

- by bank transfer 061 488 0475

Please allow 10 days for delivery
include your credit
card number and
full address. (1)

What's on the desktop?

Kuma

K SPREAD 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 its mouse-driven icon selection and multi-window presentation.



NEW * NEW * NEW * NEW * NEW * NEW *

K SEKA 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.

K RAM 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 60 times faster.



Kuma Computers Ltd., Unit 12, Phoenix Park,
Moremore Road, Pangbourne, Bucks RG8 1JN

Please send further details of the Kuma ST range

Name

Address

Phone

Trade Enquiries Please 07267-4328

Get down to business with
Kuma - first off the mark for the ST

Available from your ST-Dealer