Mysteries of USR explained
New super-fast checksum listing
Analysing loans on your micro

Game of the month: GREEDY GUNTHER

Reviews:
Printshop Companion
4010 four-head printer
OS Controller board
+ all the latest games

IT'S MAGIC! How to conjure up spellbinding effects
ACTION • EXCITEMENT • DESTRUCTION
IT IS THE WAY OF THE

Win an Actual Jackal Arcade Machine
See pack for details

COMMODORE DISC £14.95
COMMODORE CASSETTE £8.95
SPECTRUM CASSETTE £7.95
AMSTRAD DISC £14.95
AMSTRAD CASSETTE £8.95
ATARI DISC £14.95
ATARI CASSETTE £9.95

Another gripping Arcade Conversion

DISTRIBUTED BY: N.M.C. LTD., 2 IFFLEY ROAD, LONDON W6 0PA. TEL: 01-846 9701

For subscription details please send a S.A.E. to:
KONAMI SOFTWARE CLUB
Bank Building, Bank Street, Newton Abbot, Devon TQ12 2JL.

KONAMI HELPLINE
0626 56789
Link your Atari to the outside world with...

**MicroLink**

Electronic mail – The cheapest and fastest form of communication possible. It costs the same to send a message to one mailbox as to 50!

Telex – Link up with 96,000 telex subscribers in the UK and 1.5 million worldwide. You can even send and receive telexes after office hours or while travelling.

Telemessages – Type in your message before 8pm and delivery is guaranteed by first post the next day (except Sunday), anywhere in the UK and USA.

Tele-booking – Reserve train and theatre tickets, check flight details worldwide, or order from a vast range of products – from flowers to floppy discs.

Telesoftware – Download directly into your Atari any program from the ever-growing library now available on MicroLink – both games and utilities.

Company searches – Obtain facts about any British limited company in seconds, and fully analysed financial information on over 100,000 major companies.

Translation – Access the biggest and most up-to-date multi-lingual dictionary in the world, with over 380,000 words.

News – Use the powerful search commands to pinpoint vital business information from the world’s leading news services, newspapers and periodicals.

Radiopaging – If you also have a pocket radiopager you’ll be alerted each time an urgent message arrives in your mailbox. So you’re always in touch.

Gateways – Get through to New York in just five seconds – or key into the EEC computer in Luxembourg, which links you to 600 databases throughout Europe.

When you join MicroLink you’ve got the world of communications at your fingertips – 24 hours a day. You’ll have immediate access to ALL the facilities offered by Telecom Gold ... and a great deal more besides.

All you need – apart from your Atari – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided two possible options on the left.

Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.

---

**Two recommended packages**

**If you have an 850 interface:**

- Pace Nightingale manual modem + cable (£116.15) PLUS Mini Office II (£19.95).
- Total price: £136.10.

**If you don’t have an interface:**

- Total price: £149.95.

With either combination you can also log on to other databases and bulletin boards all round the world.

More than 90 per cent of subscribers can connect to the MicroLink computer at local call rates.

---

Please send me full details about MicroLink, and information sheets about the following hardware and software options (please tick):

- [ ] Pace package
- [ ] Miracle package

Name:

Address:

Postcode:

Send to: MicroLink, Europe House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY
Games console ‘stars’ on TV

A HARD-HITTING pre-Christmas television advertising campaign has been launched featuring the new Atari games console.

It is part of Atari’s commitment to its 8 bit range and backs up the company’s prediction of massive sales of video consoles and games before the end of the year.

As an Atari spokesman put it: “With the video games system starting from as little as £49.95, good software backup and outlets in a number of leading High Street stores, we can’t see how it can fail”.

The brash, colourful and exciting advert with its highly developed video graphics and stirring music is designed to stand out among the mass of pre-Christmas product promotions on the small screen.

Atari launched the campaign at the PCW Show, where it took the largest exhibiting area, occupying more than 1,000 square metres.

Another 43 companies took stands in specially-designed “pavilions” within the Atari area with a range of hardware, software and peripherals which showed the wealth of products now available for Atari computers.

Bargains in store at show

EXHIBITORS at this year’s Atari Christmas Show have begun to reveal the new products and bargain offers they have in store for 8 bit users.

Last year the first Atari Christmas Show was a resounding success, with nearly 10,000 people packing the Royal Horticultural Hall in London.

This year’s show will be held in the plush setting of the Champagne Suite at the Novotel, Hammersmith, scene of so many great computer events staged by Database Exhibitions.

From November 20 to 22, the Atari Christmas Show will mirror all the year’s past developments — with emphasis on the entirely new approach to the games market.

All the leading suppliers of Atari add-ons and software will be at the Novotel, their stands piled high with their latest products and cut-price offers.

Software Store has imported a large range of new cartridge games from America for the 8 bit machines, and will have an increased supply of bargain software on disc and cassette.

A revolutionary multi-function joystick will be launched at the show by RH Design. The company claims that its new joystick is completely different from all others on the market. Priced at under £19, the joystick includes a free two metre extension lead.

In addition to supplying cut-price discs, Zonefour will be catering for the games player with more than 30 disc based titles to choose from at the bargain price of £1.99 each.

A full range of bargain cartridge, cassette and disc based games are on offer from MCD. About 40 cut-price titles will be available as well as massive savings on Atari 400 and 800 computers, cassette recorders, joysticks and paddles.

A money saving advance ticket order form is on Page 17.

A whirl on the wheel

A FORTUNE can be won or lost at the roulette wheel — without endangering the family savings — on a new gambling game for the Atari 8 bit.

Casino Roulette is from CDS (0032 21134), the software house which has specialised in bringing traditional games to the home computer.

Using the International or French style table, the game allows up to eight players to gamble at once.

Players place their bets in any combination of 15 wagers allowed. The wheel spins, the number is selected and the program works out the winnings, adds chips to players' stacks and rakes the table.

Features include standard odds, play analysis which keeps track of individual performances, statistical analysis of the fall of the ball over the previous 370 spins and instructions including a dozen established betting systems.


Atari sales are soaring

Sharply improved results for the first half of 1987 have been revealed by the Atari Corporation. Compared with the same period last year income is up more than a massive 132 per cent, with sales showing an improvement of nearly a third at around $136 million.

"Atari continues to enjoy a favoured market position throughout the world", said a spokesman. "Record sales were achieved in both the video game and computer product lines".

"Pursuing a vertical integration, the company intends to make acquisitions in computer or related fields. An active search is underway to identify appropriate businesses whose activities will complement Atari’s operations".

The figures show that at the end of the period under review, Atari had $198 million in capital, as compared with $40 last year.
This Company has given years of full support to ATARI users Countrywide from their retail shop premises at Ormskirk Road, Preston. Now from their NEW Mail Order Depot they can offer the same Excellent service to all Mail Order Customers.

All Software and Hardware is fully tested prior to selling. This ensures Customers receive working items so that returned goods, and all the attendant frustration are a thing of the past. All Hardware is supported by our own 'ON SITE' engineers, therefore quick turn round on all repairs is Guaranteed. All prices quoted are fully VAT inc. and there are no 'hidden extras', what you see is what you get. Delivery included in price. Please ring for latest prices, new releases, etc.

130XE Computer ............... £119.00
Disk Drive ........................ TBA
XC12 Recorder .................. £32.00

Our ATARI trained engineers will repair all Hardware in minimum time at competitive rates. Please ring for a quotation. All repairs carry a 90 day warranty.

<table>
<thead>
<tr>
<th>PRINTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dot Matrix</td>
</tr>
<tr>
<td>Star NL10 ........................ £240.00</td>
</tr>
<tr>
<td>NL10 Sheeletter ............... £55.00</td>
</tr>
<tr>
<td>National Panasonic PHONE</td>
</tr>
<tr>
<td>MP165 ........................... PHONE</td>
</tr>
<tr>
<td>MP135 ........................... PHONE</td>
</tr>
<tr>
<td>LX86 Tractor Feed ............ £19.50</td>
</tr>
<tr>
<td>LX86 Sheeletter .............. £55.00</td>
</tr>
<tr>
<td>LQ800 24pin D/M ............... £25.00</td>
</tr>
</tbody>
</table>

All Printers, Disk Drives etc supplied with cables etc. NO HIDDEN EXTRAS

TO ORDER: Simply send, or phone your order, stating Full Name, Address, Visa or Access Nos, Cheque or Money order. Make payable to Ladbroke Computing International, 33 Ormskirk Road, Preston, Lancs. PR1 2QF.

We have a complete range of Software in stock and fully tested.

IF IT'S AVAILABLE we have it!
Send SAE for full catalogue.

Any Software problems? Queries?
give us a ring we usually have the answer

All Dedicated books and mugs in stock

FOR MORE INFO CALL ON THE
ABOVE NUMBERS OR SEND SAE
AND STATE FULL REQUIREMENTS
**News**

**XL answer to the dole queue**

ENGINEER Philip Gibbs has emerged from the dole queue to the brink of self-employed success with the aid of his Atari 800XL.

He bought the machine three years ago – adding a Touch Tablet, Atari Artist, 1027 printer and 1050 disc drive – but 12 months later found himself unemployed at the age of 56.

After reading a review in Atari User he bought Super-script and used it to write more than 200 job applications, but without success.

"When, after all this effort, I still couldn't get a job my thoughts turned to self-employment", Philip told Atari User.

He decided to solicit support to help him develop a new engineering product and was successful in obtaining grants from business development agencies in his home town of Sheffield.

"I added Super 3D Plotter II and a 1029 printer which enabled me to produce convincing 3D drawings. The suppliers, Demon Software, gave me lots of help to modify the program".

Philipp's prototype of a self-erecting steel tower for communications and security systems is already nearing completion.

"I'm now receiving financial support from British Steel Enterprise, British Coal and the Government to go into production", he said.

"I'm grateful to both my Atari 800XL and Atari User – they have not only helped me to survive a very difficult time, but have also helped to create jobs for five people at my new Sheffield Skyhook company".

**More games on way**

A SERIES of games old and new are about to be released on the Atari 8 bit by Tynemouth.

Due out soon is Winter Olympics '88, timed to coincide with the opening of the real thing which is taking place at Calgary in Canada.

Tynemouth (091-414 4611) says six of the most challenging Olympic events have been selected to test the player's abilities to the full.

Ski Jumping, slalom, downhill racing, tobogganing, the gruelling biathlon and speed skating are all on the £3.95 cassette.

Mirax Force, the space war game which sets a lone fighter against the guardians of a fleet of heavily protected motherships, has been rewritten for the 8 bit, price £7.95 on cassette and £9.95 on disc.

Tynemouth's first Four Great Games compilation proved so popular that the company plans to release another.

The Atari 8 bit version will have Who Dares Wins II, Space Hawk, Mousetrap and Killer Cycle, at £3.99 for a twin cassette pack or £5.99 on disc.

**SILENCE IS GOLDEN**

A CLEVER new device which allows computer game players to run their favourite programs without disturbing the rest of the household has just been released.

Chasing those high scores without fear of complaint has been made possible through Sound Master, which costs just £14.99 from Database Electronics (061-480 0171).

The package which can be used with all Atari 8 bit machines except the 400 includes a special interface encased in tough plastic with a graded volume control.

The beautifully constructed Ross stereo headphones are fully guaranteed. They come with a special adapter which allows them to deliver crystal clear reproduction with personal stereo or hi-fi systems.

Every Sound Master is supplied in a colourful presentation pack with detailed instructions.

Nine games enter the chart this month – you can find reviews of 180, Storm, On Cue, Feud and Boulder Dash II in this issue of Atari User. The Top 10 is dominated by budget software with the £1.99 Decathlon holding the number one position.

---

**THE GALLUP CHART**

<table>
<thead>
<tr>
<th><strong>THIS MONTH</strong></th>
<th><strong>LAST MONTH</strong></th>
<th><strong>TITLE</strong></th>
<th><strong>PRICE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>DECATHLON Firebird</td>
<td>1.99</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>180 Mastertronic</td>
<td>2.99</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>MILK RACE Mastertronic</td>
<td>2.99</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>STORM Bulldog</td>
<td>1.99</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>ON CUE Mastertronic</td>
<td>2.99</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>FEUD Bulldog</td>
<td>1.99</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>LIVING DAYLIGHTS Domark</td>
<td>9.95</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>GAUNTLET US Gold</td>
<td>9.95</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>SILENT SERVICE Micropro/US Gold</td>
<td>9.95</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>SUPERMAN First Star/Prism</td>
<td>2.99</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>FRENESIS Mastertronic</td>
<td>1.99</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>TABLE FOOTBALL Rhino</td>
<td>1.99</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>BOULDERDASH First Star/Prism</td>
<td>2.99</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>BOULDER DASH II First Star/Prism</td>
<td>2.99</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>LEADERBOARD Access/US Gold</td>
<td>9.95</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>DIZZY DICE Players</td>
<td>1.99</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>BMX SIMULATOR Codemasters</td>
<td>1.99</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>MOLECULE MAN Mastertronic</td>
<td>1.99</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>GUN LAW Mastertronic</td>
<td>1.99</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>MICRO RHYTHM Firebird</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Compiled by Gallup/Microscope

November 1987 Atari User 7
USA link back in action

THE giant American database Mnematics is once again available to MicroLink subscribers after a complete reorganisation.

Mnematics' switch to a more efficient system carrier caused the temporary severance of UK links with the dynamic electronic information source.

But now MicroLink subscribers can again chat to enthusiasts in the USA and tap the vast array of computer-related and special interest group sections.

All the old Mnematics features are back - plus some new departments - and there are plans for even closer ties with MicroLink.

These include a reverse gateway to allow the Americans to make direct calls to MicroLink and see what's on offer over here.

Farming baronet on line

DOWN on the farm or in the factory, baronet and MicroLink subscriber Sir Charles Legard is equally at home thanks to computer communications.

Information technology makes sure he's always up to date with what's happening on his North Yorkshire estates in the Vale of Pickering as well as the family businesses in Leeds and Bradford.

Sir Charles farms 1,700 acres of arable land around Scampston Hall, Malton, in addition to running companies involved in engineering and wholesaling electrical components.

Legards have owned land in Yorkshire since the 12th Century, but the micro and modern are now as much a part of the scene at Scampston Hall as the family portraits.

"Whether I'm at home or in one of my offices, computer communications keep me constantly in touch with what's going on elsewhere", said Sir Charles.

Communicating to cut unemployment

TWO organisations at opposite ends of the spectrum are using MicroLink communications as they attempt to reduce unemployment.

Camden Jobtrain in North London provides local youngsters with opportunities to learn the specific skills which surveys have revealed are most wanted by employers in the area.

There are 120 places on courses in motor mechanics, carpentry and joinery, office skills, catering, and care for the elderly and young children - all leading to City and Guilds or other qualifications.

At the other end of the scale, the Mid-Career Development Centre in Croydon helps business and professional people who have been made redundant or want a more fulfilling job.

The Centre's experienced career counsellors provide individual help to restore confidence and practical assistance in getting a new job.

"Many people find that being made redundant turned out to be a lucky break because it galvanised them into action they might otherwise never have taken", says principal Kieran Duignan.

Your chance to join MicroLink - turn to Page 4

BR BOOKING EASIER

MICROLINK's convenient British Rail telebooking service has been given a complete update.

It allows subscribers at any hour of the day or night to order train tickets for journeys between London and more than 20 major UK centres from Aberdeen to York.

Subscribers can book their journeys via MicroLink after studying the electronic timetables in the comfort of their own home or office, and charge them to their Access, Barclaycard, American Express or Travel Key account. Tickets are sent by return post.
USR is the most powerful and versatile function in Atari Basic—but it’s also the most poorly documented. You’ll come across it frequently in magazine listings, but very few Basic text books give it more than a passing mention. In this two-part series, we'll examine the rules for using USR and present a few programs to show how you can make it work for you.

First of all, let's define it. USR is a function (like PEEK, LOG or STRIG) and it allows you to run a machine code subroutine from inside a Basic program. That may not sound too earth-shattering, but in fact it adds enormously to the range of things your computer can do.

There are many tasks which Basic can't handle, either because it's too slow or because it doesn't contain the relevant commands. Vertical movement of player-missile graphics, fine horizontal and vertical scrolling, display list interrupts and direct CIO calls are among these.

Machine code, on the other hand, can do almost anything and executes at lightning speed, but it makes heavy weather of some tasks which Basic can handle easily, like complex arithmetic, string manipulation and drawing things on screen.

USR gives you the best of both worlds. You can write most of your program in Basic, and use machine code for only those bits that need it. But USR is rather finicky, and you have to be very careful to observe all its rules, otherwise your program will probably crash. So here's how to use it, step-by-step.

First of all you need a machine code routine for USR to execute; if you can't write machine code, you can't use USR. But you don't need to be an expert machine code programmer—even very short and simple routines can be extremely interesting and worthwhile. Here's the simplest we can think of:

```
LDA #0
STA 710
```

This is the equivalent of POKE 710, 0, so it's not particularly exciting, but it will serve to demonstrate how USR works. If you were programming entirely in machine code, the routine would be fine in this form, but if it has to be called by Basic and hand control back to Basic afterwards, you need to add two linking instructions.

The routine should start with a PLA (for reasons which will become clear next month), and the very last command must be RTS. The full working machine code routine is shown in Program I.

You can't type these instructions in Basic, of course. Some form of assembler is needed, such as Atari's Assembler Editor cartridge. This can accept Program I in its listed form (which is known as source code) and will convert it into object code—a string of numbers which the 6502 processor can understand.

Since we're planning to run this routine from inside Basic, it has to be stored in memory along with the Basic program. The easiest way of doing this is to write the numbers into your Basic program in the form of DATA statements and get Basic to put them into an appropriate memory location—Program II shows one way of doing it. But first you need to convert your source code into decimal numbers.

Any Assembler will work out the numbers for you, but it will usually display them in hexadecimal form. Converting them into their decimal equivalents is easy enough for small routines—just look up the corresponding numbers in tables, or use a hex-to-decimal converter program such as Program III.

But for longer routines it's worth using a more sophisticated program which will do all the conversion and also write the DATA statements for you—we'll give you one next month. The four-line routine at Program I translates like this:

```
Source code          Hexadecimal      Decimal
PLA 68   104
LDA #0  A9 00   169 0
STA 710 80 C6 82 141 198 2
RTS 60   96
```

These decimal numbers have to be stored somewhere safe in memory, and Page 6 (addresses 1536 to 1791) is a good place to use while you're learning.

Try running Program II: If all is well, the screen will turn black. No big deal so far, but here's something interesting to try—press Reset to restore the blue screen colour and type NEW to get rid of the Basic program.

Now type X=USR(1536) and hit Return—the screen goes black again—even though there's no visible program in memory. The reason is, of

Turn to Page 10 ▶
course, that NEW doesn’t wipe page 6, so your machine code routine will survive until the power is turned off.

If we were to write line 40 in English, it would go something like this: Stop processing the Basic program, execute the machine code routine whose first instruction is at address 1536, then return to the Basic program and resume at the instruction immediately following this USR statement.

The syntax of USR can be a bit confusing - what’s the significance of X, for example? Well, remember that USR is a function, like PEEK or STRIG, so it needs an argument to make it work. In Program II we could have used PRINT USR(1536) or LIST USR(1536), but this would have interfered with the screen display, so instead we use X=USR(1536).

Although a number will be returned in X, it is usually of no significance, so you can regard X as a dummy variable. And of course you need not use the letter X - any variable name will do - but be careful you don’t overwrite any variables you’re currently using.

We’ll finish this month by looking at a couple of programs which use USR, first to do something outside Basic’s capacity and second to do a conventional job faster than Basic.

Program IV, which can be loaded from Basic using Program V, contains

```
10 COTMA#226
20 COTMU#226
30 CHACT#213
40 #=$60B
50 SETVEC
60 PLA
70 LDA #BLINK255
  Tell the computer where the
80 STA COTMA
  'blink' routine starts - it
90 STA #BLINK256
  will JSR
through this address
100 STA COTMA+1
  when COTM V counts down to 0
110 LDA #10
120 STA DELAY
Set blink rate
130 BNLK
140 LDA CHACT
Read content of 735
150 EOR #2
Change it from 2 to 0,
150 STA CHACT
  or vice v
160 RST
reset keyboard
170 LDA DELAY
reset fl.
time the routine is called
180 STA COTMV2
routine is called
190 RTS
return to Basic
200 DELAY ####+1
```

Program IV: Machine code flashing cursor

```
20 $=60B
30 START
40 PLA
50 LDA #213
51 LDA #214
52 BSR DONE
53 STA #214
54 BSR STORE
55 RTS
```

Program V: Basic loader for Program IV

```
10 TSS #R78
20 $=60B
30 START
40 PLA
50 CMP #15
If stick centered
51 JMP DONE
52 BUS DONE
53 STA #215
54 RTS
55 RTS
```

Program VI: Machine code etch-a-sketch routine

Program VI is a simple Etch-a-sketch routine, loaded from Basic in Program VII. It reads the joystick, checks that screen boundaries will not be exceeded and calculates the new X and Y coordinates.

Basic could do all these things, but machine code is much faster. The GRAPHICS and PLOT commands, on the other hand, are difficult to program in machine code, so we leave these jobs to Basic, which finds them easy.

You can play around with Program VII by changing the last six DATA numbers in line 60. These control, in order, the pixel’s X and Y starting position and the maximum/minimum limits for horizontal and vertical movement. By altering these values you can tailor the routine to suit other Graphics modes.

Next month we’ll look at how USR can be made to transmit data, such as variable values or the results of arithmetical calculations, from Basic to the machine code routine.

```
10 FOR A=0 TO 93:READ D:POKE 1536+A,
15:NEXT A:REM insert the machine code,
20 DATA 106,175,126,2,201,15,240,78,14
30 DATA 1,87,6,41,1,280,14,173,95,6,285,89,
40 DATA 6,175,24,286,8,6,7,4,173,87,6,4,
50 DATA 4,173,14,173,95,6,285,88,6,
60 DATA 175,24,286,8,6,7,6,6,173,87
70 DATA 4,173,14,173,95,6,285,89,
80 DATA 6,175,5,236,8,6,96,8,20,79
90 DATA 5,20,9,
100 GRAPHICS 5,
110 COLOR PEEK(644):POKE(1624),PEEK(1625),PEEK(1625),
120 COLOR 60
```

Program VII: Basic loader for Program VI
JAMES PIE unravels some of the mysteries of micro jargon

- "Delivery will be at the end of the month" – Another way of stating the universal constant, for the innumerate.
- "In stock" – We have ordered it from the manufacturers.
- "Now in stock" – When the closing date for the advertisement was reached three weeks ago, we were promised delivery inside a fortnight.
- "Tomorrow's technology, today" – It arrived here a day early.
- "Obselete" – We've had it in stock for more than a week.
- "Will be available shortly" – We haven't actually made one yet, but can foresee no problems.
- "Will be available later in the year" – We discovered a few problems.
- "Will be available sometime next year" – We lost the blueprints.
- "Extensive documentation" – Large, poetically written tome of no technical use whatsoever.
- "Operating system" – Something we sell you every six months or whenever you find the bugs in the last one we sold you.
- "The program can easily be modified to run on other versions of Atari computers" – Sometimes seen at the end of articles: A disclaimer for any intelligence the author might have falsely indicated to the reader.
- "User friendly" – You are asked for every little option and parameter to see if it needs to be included. This will take at least 10 minutes and you will have to go through the whole lot again if you want to change something.
- "Easy to use" – The average graduate of computer science should experience no difficulty.
- "Powerful" – It's so good, even we can't understand it.
- "Advanced" – So complex, even the programmer can't understand it.
**Feature**

- **From Page 11**
  - "Easily expandable" — There's a lot of sockets on it, but we don't know what to do with them.
  - "A must for every Atari user" — It's nothing new and we couldn't think of anything original to say about it.
  - "Rom" — An illiterate ram.
  - "Massive ram" — Mean looking beast, approach with extreme care.
  - "WYSIWYG" — What you see is what you get. We don't supply the plug, the cassette lead, the instructions...
  - "WIMP" — Any computer literate person of non-Atari persuasion.
  - "Disclaimer" — We do not accept there are any bugs in this software preventing it from doing its job.
  - "Software" — You must be soft in the head to buy this rubbish.
  - "Hardware" — Software made from steel wool.
  - "Firmware" — Another name for hardware.
  - "Shadow ram" — Memory chips that work in the dark.
  - "Second processor" — The first one we sold you doesn't actually enable you to do anything useful, for that you'll need a new one.
  - "Mouse" — Small, incredibly cute, but odiferous rodent.
  - "8 bit Atari" — Keyboard, monitor, disc drive, tape deck, joystick and three transformers.
  - "16 bit Atari" — Twice as many pieces as an 8 bit Atari.

---

**SALE**

- **Buy now at specially discounted prices** — The product is about to be discontinued.
- **Bug** — A feature not included in the documentation.
- **Feature** — A documented bug.
- **Ram** — Unintelligent, male herbivorous quadrupedal mammal.

---

**MILES BETTER SOFTWARE**

221 Cannock Road, Chadswood, Cannock, Staffs WS11 2DD. Tel: (05435) 79089

---

**US GOLD**

- **Rebel Charge** 22.95
- **Bizzarthe** 25.95
- **Atari Mentor** 2218 Baker Street 15.95
- **Broodside** 25.95
- **UL 251** 22.95
- **Computer Ambush** 24.95
- **Warship** 25.95
- **Carrier Force** 25.95
- **Colonial Conquest** 24.95
- **Wizard** 25.95
- **Battle of Antares** 25.95
- **Kangaroo** 19.95
- **Printshop** 35.50
- **Graphics Disc I** 17.00
- **Graphics Disc II** 17.00
- **Platform Perfection** 2.50
- **Beer - Droplets + Cannons** 8.00
- **Atari Acorn** 8.50
- **Shots are us** 8.50
- **Summer Games** 10.95
- **Arcade Classics** 7.95
- **Temple of Apeshe Trilogy** 11.95
- **Ultima IV** 16.95
- **Red Over Moonstone** 7.95
- **Beach Head II** 7.95
- **Leaderboard** 7.95
- **Super Huey** 8.95
- **Field of Fire** 8.95
- **Vietnam** 8.95
- **Guerilla** 8.95
- **Alternate Reality III** 8.95
- **Phantasm** 16.95
- **Gryphons** 25.95
- **Payday** 25.95
- **Broderbund** 25.95
- **War Game Construction Set** 25.95
- **Medal Of Honor** 25.95
- **Leaderboard Tournament** 4.99
- **Gaudet Deep Blue Dungeon** 4.99
- **War In Russia** 25.95
- **ENGLISH SOFTWARE**
  - **Cass. Disc.**
  - **Smash Hit Vol. I** 8.95
  - **Smash Hit Vol. II** 8.95
  - **Phone for availability**

---

**ACTIVISION**

- **Ghostbusters** 8.95
- **IDEAL MASTERS** 12.95
- **BMX 3** 9.95
- **Rescue Me** 9.95
- **DOMARK** 12.95
- **Living Daylights** 8.95
- **Trivial Pursuit** 8.95
- **ELECTRIC DREAMS** 12.95
- **Dazzle** 8.95
- **DIGITAL INTEGRATION** 12.95
- **Fighter Pilot** 8.95
- **Tomahawk** 8.95
- **NOVAGEN** 8.95
- **Mercenary** 8.95
- **Second City** 7.95
- **Mercenary Comp. Pack** 12.95
- **DATABYTE**
  - **Spy V Spy I** 7.95
  - **Spy V Spy II** 7.95
  - **Brute Force** 11.95
  - **Hijackers Guide to the Galaxy** 8.95
  - **Lurking Horror** 8.95
  - **MASTEROUS**
    - **On Cue** 7.95
    - **Storm** 8.95
    - **Amerosol** 8.95
    - **Universal Hero** 8.95
    - **Kick Start** 8.95
    - **Last V8** 8.95
    - **Ninja** 8.95
    - **S.W.A.T.** 8.95
    - **Crystal Raiders** 8.95
    - **Gun Law** 8.95
    - **Minimal Carnage** 8.95

---

**Frimex** 1.99
**Holler Bowler** 1.99
**RAIDER** 1.99
**Jewels of Darkness** 1.99
**Silicon Dream** 1.99
**BUBBLE BUS** 4.95
**Stampede** 4.95
**GREMLIN GRAPHICS** 9.95
**Phantasm** 9.95
**FUTURIST** 9.95
**SYSTEM 3**
  - **International Kart** 5.60
  - **SEGAR** 9.95
  - **Zytron - Powerd** 9.95
  - **TYNESOFT**
    - **Who Dares Wins II** 4.95
    - **Railway Speedway** 8.95
    - **DATABASE** 12.95
  - **MINI OFFICE E** 18.50
  - **MICROPROSE**
    - **Silent Service** 9.95
    - **F-15 Strike Eagle** 9.95
    - **Super Fight** 9.95
  - **Beverland Commander** 9.95
  - **Decision at the Desert** 11.95
  - **Coast to Coast** 11.95
  - **C.D.S. SOFTWARE**
    - **Brian Clough's Football** 12.95
    - **Colossus Chess IV** 12.95
  - **ORIG** 8.95
  - **AutoCAD** 17.95
  - **Otto** 10.95
  - **Ultralite** 16.95
  - **Ultima IV** 16.95
  - **ATAI SOFTWARE**
    - **Star Raiders II** 12.95
    - **CAMELI**
      - **Joust** 5.65
      - **Trek** 5.65
      - **RED RAT SOFTWARE**
        - **Astro Droid** 5.65
        - **Space Lobster** 5.65
        - **Spring** 5.65
        - **Gambles Odes** 5.65
        - **Screaming Wings** 5.65

---

**BUDGET TITLES**

- **Cass. Disc.**
  - **Colony** 1.99
  - **War Hawk** 1.99
  - **Football Manager** 1.99
  - **Master Chess** 1.99
  - **Micro Rhythm** 1.99

**HARDWARE**

- **Sega System 249.95**
- **Nintendo System 295.00**
- **Atari 2600 TV 299.00**
- **Ensoniq XE 299.00**
- **Ferguson CMWQ Monitor/TV 299.00**
- **XECL cartridge unit + green screen 244.00**
- **65XE Console incl. software & joystick 273.00**
- **65XE Computer incl. joystick & lightgun 110.05**
- **130XE Computer incl. Computer XECL 219.00**
- **F51-D-S Disc-Drive 275.00**
- **IBM M801 Printer 181.00**
- **CGA Touch Tablet 420.00**

**PHONE FOR LATEST ST PRICES**

For full list of ST Software see our advert in the Atari ST User. All prices are correct at time of going to press. Access или cage orders welcome. Please add £1 per line for overseas orders. Please make cheques or Postal Orders payable to: "INDOOR SOFTWARE" Phone or write for comprehensive stock list for Atari and ST software — hardware.
**Storm blows up**

**Product:** Storm  
**Price:** £2.99  
**Supplier:** Mastertronic, 8-10 Paul Street, London EC2A 4JH  
**Tel:** 01-377 8411

THE beautiful Corrine, beloved wife of Storm the Warrior, has been captured by the evil minions of Una Cum and is being held prisoner in his laboratory somewhere within his castle.

Storm has decided to make his way there and hack and slash and generally chop anything that gets in his way.

To aid him, Storm has enlisted the help of his comrade and powerful wizard Agravain the Undead.

Luckily for the two heroes, Una Cum has left his castle to search for a mystical box called The Fear. So off they trot to create complete havoc and destruction.

The game has a two-player option (Storm and Agravain the Undead respectively) with the heroes controlled by joystick.

You must battle your way through the game avoiding the deadly traps while watching out for Una Cum's evil minions who lurk around the castle.

The on-screen display has the score and energy level for both players at the top with the main game screen directly underneath.

Here are some useful starting points: You must collect three brooches before you are able to unlock the door to Una Cum's laboratory.

The armour will provide protection for you against Una's evil minions, while food and restorative fluids will improve your energy levels.

Various scrolls and amulets will temporarily destroy the evil horde, and the Mask magic is very powerful so use it wisely.

While Cabbalasis will release traps, sometimes this will land you in trouble.

The inlay card describes this game as a thrilling, highly addictive arcade adventure — it impressed me because of the quality.

If you want a challenge but don't want to break the bank, buy Storm and see how much havoc you can cause on a peaceful sunny day.

**Elizabeth Jones**

**Graphics**............. 6  
**Sound**............... 7  
**Playability**........... 6  
**Value for money**..... 7  
**Overall**.............. 6

---

**Right on cue**

**Program:** On Cue  
**Price:** £1.99  
**Supplier:** Mastertronic, 8-10 Paul Street, London EC2A 4JH  
**Tel:** 01-377 8411

DON'T worry if you can't decide whether you'd prefer to play a snooker or a pool simulation on your computer, On Cue gives you both of these green baize games on a single cassette. That works out at just under £1 a simulation.

And the games are good. Most of the display is taken up with an overhead view of a black (not green) table with red cushions. At the bottom of the screen is a message area used for keeping a record of the score, whose turn it is and various prompts.

The balls are clearly depicted and it is not difficult to distinguish between the colours. For example, the black ball in snooker is specially marked so that you can pick it out against the black background.

Controlling your shots (with a single joystick only) is simple and involves three stages. You are prompted by an appropriate instruction in the message area at the bottom of the screen at each step of the way.

First you move across to the point at which you are aiming. Then you select the direction of the spin. Finally you dictate the strength of the shot by setting the power meter — and away flies the ball.

From time to time it may be necessary to position the cue ball — this, too, is accomplished with a simple joystick movement. There is also an option to edit the table.

The balls move quite smoothly and while some of the collision effects are a little unpredictable — sometimes a ball may stop suddenly or continue rolling for longer than seems probable — overall the simulation is quite decent.

The cassette has been recorded so that both games are present on both sides of the tape, with snooker being first on one side and pool first on the other. A thoughtful touch.

You can opt to play against another player or the computer and the micro's skill level can be adjusted to suit your own taste.

On Cue is an entertaining pool and snooker simulation.

At this low price, it represents an opportunity too good to be missed.

**Bob Chappell**

**Sound**................. 6  
**Graphics**.............. 7  
**Playability**........... 9  
**Value for money**..... 9  
**Overall**.............. 8
Bull’s eye

Product: 180  
Price: £2.99  
Supplier: Mastertronic, 8-10 Paul Street, London EC2A 4JH  
Tel: 01-377 8411

IF I were to talk of the "crafty cockney", which sport would you visualise? The only possible answer could be darts and 180 is the new darts game from Mastertronic.

You have three basic options: Practice, tournament or the two-player game. The practice game is very useful and I recommend that you play it to get a feel of the joystick movements.

You are playing against the clock and have to hit the numbers in sequence from 20 to 1. This isn’t easy but is fun and can improve your aim for the competition proper to come later.

In the tournament the computer can field eight different opponents. You come into the tournament at the quarter-final stage and have to beat three opponents to win the world championship.

Your opponents all have improbable names such as Belly Bill, Limp-Wrist Larry and the World Champion is called Jammy Jim.

Each player has his individual style with favourite own doubles and finishing techniques. The instructions said that it is useful to work these out but it didn’t improve my game greatly.

The choice of opponent is random and so you get a different game almost every time.

The main game is standard matchplay darts, where two players play against one another to see who can score 501 first. The winner must win on a two out of three basis - called a set.

You can aim at any part of the dart board but you must remember that you have to finish on a double.

You aim with the joystick. When the dartboard appears push your joystick up to set the hand in motion, all movement is by using the diagonals, and the dart is released by pressing fire.

The game contains a lot of humour and is superb value for money. If you score the magic 180 the computer will let out a digitised yell of “180!”.

The graphics are nice and the movement of the hand is very smooth and this game will give the enthusiast hours of lasting enjoyment, cheaply.

Ruth James

---

Feudin’s fun

Program: Feud  
Price £1.99  
Supplier: Bulldog Software, 8-10 Paul Street, London EC1A 4JH  
Tel: 01-377 8411

THERE were once two brothers, Learic and Leanoric, extremely knowledgable in the arts of magic, and they lived together in peace and quiet in the small village of Little Dullford.

Then one summer Leanoric turned his brother into a frog. Not a very nice thing to do to anyone, let alone your own brother. After a week, Learic was restored to human form, but already the dark clouds of a feud were beginning to build up.

Then everything changed. The forest went quiet, then shouts, bangs and explosions erupted from the trees. Leanoric left his house to move to the other side of the village, and the feud began. And woe betide anyone who got in their way.

That’s the story, so on with the game. Leanoric is your deadly enemy, and will do his utmost to destroy you. So, as all good feuds go, you have to destroy your brother, or be destroyed.

To do so, you must travel around the kingdom (mainly in the garden of the farmer Hieke) collecting herbs in order to mix and cast spells of different results.

But the villagers, especially Hieke, don’t take kindly to warring wizards fighting it out in their back yards, especially Learic (for some unknown reason), who is controlled by you.

To collect a herb, you just stand in front of it and walk towards it. Learic will then bend down and pick up the herb.

Then the page on which the herb is shown will suddenly flip into view (a nice touch). To mix a spell, you have to stand in front of the cauldron, press fire and left or right to move to the page in the spell book with the spell that is required.

Release the fire button, and bingo, the spell will be mixed, but only if you have both ingredients (shown in red). You will then be armed with that spell.

Fantastic graphics, great sound, addictive gameplay and lots and lots of action-packed screens make this game a must. And for only £1.99. It may not appeal to everyone, but if you’ve got some time to spare play Feud. You won’t be sorry.

Robert Swan

---

Table of scores:

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Sound</th>
<th>Playability</th>
<th>Value for Money</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>
**Slightly soured**

Program: Milk Race
Price: £1.99
Supplier: Mastertronic, 8 Paul Street, London EC1A 4JH.
Tel: 01-377 8411

There have been racing games galore on the Atari and most seem to bear more than a passing resemblance to Pole Position. Now Mastertronic has released Milk Race, the target of which is to win a cycle race around Britain.

You start in Newcastle, and must make your way down to London before a certain date in order to win the race.

The game starts with a nice piece of music, and a colourful splash over the title page. You are also presented with the option to turn the music on or off.

You begin on the line with a few other racers when the starter waves a flag, and you're off.

Well, not quite. Other racers do have a nasty tendency to cycle up behind you and knock you off.

If you do manage to pull away without mishap, you can work your way through the bike's 12 gears to gain maximum speed.

As you speed up your energy level decreases, so you must collect pints of milk, found in bottles strewn along the roadside, to replenish your falling energy stock.

These come few and far between, so when you do see one make sure you get to it before the other racers, or they'll take it.

Cars also zoom along the roads (which in itself is strange, as cars are banned from travelling along the same roads as the racers) so make sure they don't hit you, or it'll cost you another few precious moments.

Crowds watch from the roadside, but some spectators must be as fast as the racers, as they reappear every so often along the route.

The racers are all exactly the same, so it's almost impossible to tell who you are without waggling the joystick from side to side, thereby losing precious time.

Gaining speed is extremely difficult, and when you do actually manage to collect a milk bottle, the energy level rises by a most insignificant amount.

I am more than a little disappointed.

Robert Swan

**Spellbinding**

Product: Druid
Price: £3.95 (cassette) £14.95 (disk)
Supplier: Firebird, First Floor, 64-68 New Oxford Street, London WC1A 1PS.
Tel: 01-379 6755

In the kingdom of Belorn, balance of power and peace has been held for many years. But this peace has now been upset by the arrival of four demon princes, who have appeared through an interdimensional gateway and arrived in the dungeon of the thoroughly evil Lich Acamantor.

Terror has now spread across the kingdom, and the task of their destruction has been passed into your hands.

As the last of the Great Druids you must herculeanly cast all fears and do mortal combat with the evil ones.

You must search the lands collecting keys that allow you to travel through the eight dangerous levels, infested with hordes of evil creatures including snakes, slimes, beetles and demons.

Your only weapons are the awesome spells you have at your disposal if you find the magic chests containing them.

Most effective is the golem spell, which creates a creature to protect you. You have the option of controlling the golem by joystick or having the computer control him for you.

As you move around the various levels you will find several chests. Opening them is simple - just walk on to them. You will now be able to use the spells contained within.

However, this acquisition is not without risk, as once you have removed anything from a chest the Prince of Darkness will sense that it has been opened and destroy it so that no more spells can be taken from it again.

If any of the creatures you encounter touch you they will drain your energy reserves - indicated by a bar in the top left of the screen.

To recharge your energy, Pentagrams of Life have been scattered around. By standing on them you will be partially restored. Creatures can be destroyed with spells by pressing the fire button.

Stairs are scattered around the dungeon levels and allow you to go up or down levels.

I enjoyed Druid - an arcade style shoot-em-up, which involves thought if you want to finish. The graphics are clear, the sound acceptable, and the scrolling very smooth.

Neil Fawcett
Dashed good

Product: Boulderdash II: Rockford's Riot
Price: £2.99 (cassette) £4.99 (disc)
Supplier: Prism Leisure, Unit 1, Baird Road, Enfield, Middlesex EN1 1SJ.
Tel: 01-804 8100

THIS is one of those games where I would like to take the programmer by the hand and give it a good shake. Very rarely do I get addicted to a game, but this one had me playing until early in the morning.

You are met by a superb title screen and from there it gets better. The game has everything going for it, stunning graphics, superb scrolling, neat sound effects and the cutest little hero you would ever want, Rockford the rockmite.

Game play is as for the original Boulderdash and equally as addictive, and we now have it in the shops for a fantastic £2.99.

Rockford must search through each cave and collect as many jewels in as short a time as possible. Once this is done a door to an escape tunnel will appear. This is the easy part of the game, and luckily the boulders scattered around the screen fall in predictable patterns.

This does however leave the growing amoebas, fireflies and butterflies. You will have to kill them to turn them into jewels.

And a great deal of thinking and strategy is required if you want to survive.

You start with three lives and gain an extra one for every 500 points scored. Another life is also gained if you succeed in finishing a bonus screen.

There are 16 caves (A–P) to conquer each consisting of several scrolling screens, not including the four intermission screens.

Each cave has five difficulty levels and you have a choice of four caves from which you can start (A,E,I or M).

You can choose a combination of level and starting cave from the main menu using the joystick. On levels four and five you must start in cave A.

Rockford's animation is superb; if you leave him standing around for too long he stamps his foot and blinks at you.

If you haven't been initiated into the world of Rockwell here is your chance, so don't miss out.

Neil Fawcett

---

Tricky text adventure

Program: Escape Part 1 and 2
Price: £3.95 each (cassette) £4.75 (disc)
Supplier: AD400, 40 Children Gardens, New Malden, Surrey KT3 6RT.

ESCAPE is a two part text adventure designed to run on smaller-memory Atari Micros (those with at least 16k).

Availability is by mail order only, Escape follows the traditional path of text adventures for limited memory machines. That is, locations, vocabulary and descriptions are necessarily restricted and input is generally of the single verb and noun variety.

However, what marks Escape for special attention is the fact that a lot of solid puzzles have been crammed into each of the two parts, making them especially good value for money.

Another point worth mentioning is that owners of smaller Atari's have been starved of good adventures, and any decent programs that try to satisfy this hunger deserve to be treated with respect.

As special agent AD400, Escape Part 1 sets you down in a foreign prison. Not only must you set about an escape attempt, but you must also make adequate preparation for Part 2.

The second part cannot be played until you have successfully completed Part 1 - you need a special password that only victory in Part 1 will produce.

You begin in the prisoner's quarters in which there is a stove and mirror. Your door is not locked, and you are free to roam the prison's inner confines.

However, escape is not going to be that easy - a guard is constantly on patrol.

While nothing nasty will happen if he catches you out of your cell, he will confiscate any object you happen to be carrying and return it to its rightful place.

And he's not the only one who will retrieve any items you are not supposed to have. The governor, mail clerk and store clerk are ever vigilant too.

Locations include a guardhouse, mess hall, kitchen, stores and offices of the mail clerk, governor and store clerk. There are other places, but most can only be accessed after you've found the entrances or unlocked locked doors.

Escape Part 1 is fairly straightforward, but by no means a walk-over. Part 2 is a shade tougher. In this you must complete your escape from the prison.

You start just outside the gatehouse. It is dark but there's a full moon and a light breeze.

In the stores nearby you'll find a map, compass, bottle, candle, wire cutters, mail-bag, matches, coal dust and chocolate - perhaps you amassed this collection during Part 1?

There are some neat puzzles in this adventure, my favourite being the one which involves making your face less likely to be seen in the dark. As the author told me, all you need is logic.

Escape Parts 1 and 2 are good value for money, containing as they do a good variety of puzzles and an enjoyable challenge.

You can obtain even better value if you buy the two parts together (tape £6.75, disc £7.75).

These are two little gems you would be well advised to acquire.

Bob Chappell
The big event of 1987...

Atari User Christmas Show

Organised by Database Exhibitions

Champagne Suite, Novotel, Hammersmith, London W6

10am-6pm Friday  November 20
10am-6pm Saturday November 21
10am-4pm Sunday  November 22

The record-breaking Atari User Show is back - with three action-packed days devoted to the ever-expanding Atari market.

★ Try out the very latest UK and US 8-bit software
★ See the full ST range, including the new mega-ST
★ Snap up the never-to-be-repeated bargains
★ Expand your system with powerful new add-ons
★ Get helpful advice from Atari User's own experts
★ Experience the fascinating world of communications ... and much, much more!

This is the one show you mustn't miss!

Bring this coupon to the show to get 50p per person off the normal admission price of £3 adults £2 (under 16)

50p OFF

ATARI USER CHRISTMAS SHOW

Friday
November 20
10am-6pm

Saturday
November 21
10am-6pm

Sunday
November 22
10am-4pm

Between shapes

SIMON REASON introduces you to the gentle art of tweening on your Atari

TWEENING – short for in betweening – is the changing of one shape to another. The shapes involved are mainly wireframe and amazing effects such as the title screen in Electraglide can be achieved.

The listing presented here gives you the power to tween several objects, using up to about 50 points, a number which is determined only by memory limitations.

Type in Listing 1 and use the new Get It Right checksum program to ensure you have made no errors.

When you run the program you are first asked to enter the maximum number of points for your shapes and here you must type in the number of corners the most irregular one will have. The display will then show a flashing dot on the screen which can be moved around by the cursor keys or a joystick. Pressing Fire on the joystick or Return on the keyboard will set that position as a point of your shape.

To help you draw the shapes you can add a grid of lines or dots. Pressing G will display a grid of lines 10 pixels apart and pressing D will display a grid of dots each five pixels apart. Pressing the same key again will toggle the grid off.

To tween two shapes which have different numbers of points, the shape which has the least number will have one corner as two corners, so it will appear that the shape has one side less that it really has (see Figure I).

<table>
<thead>
<tr>
<th>MAIN VARIABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXX, MAXY</td>
</tr>
<tr>
<td>MINX, MINY</td>
</tr>
<tr>
<td>P</td>
</tr>
<tr>
<td>X,Y</td>
</tr>
<tr>
<td>ACTUAL COL</td>
</tr>
<tr>
<td>COL</td>
</tr>
<tr>
<td>AX(I),AY(I)</td>
</tr>
<tr>
<td>BX(I),BY(I)</td>
</tr>
<tr>
<td>HZ(I)</td>
</tr>
<tr>
<td>VT(I)</td>
</tr>
<tr>
<td>PX(I),PY(I)</td>
</tr>
<tr>
<td>COL(I)</td>
</tr>
<tr>
<td>PKE</td>
</tr>
<tr>
<td>ST</td>
</tr>
<tr>
<td>X1,Y1</td>
</tr>
<tr>
<td>MX</td>
</tr>
<tr>
<td>STORE</td>
</tr>
<tr>
<td>S</td>
</tr>
<tr>
<td>GRID</td>
</tr>
<tr>
<td>DOTS</td>
</tr>
</tbody>
</table>
This can be done with any number of points, so that any wireframe shape may be tweened to any other.

Pressing C before setting a point on the screen will toggle the colour of the line to that point between white and black so you can draw invisible lines as part of your display.

This may only be done with the first shape and when the second is being drawn, then the colour which has already been selected on the first shape will be shown at the bottom of the screen.

An invisible line will not overwrite a white line that has been drawn so it is possible to tween more than one object. Each object tweened is connected by an invisible line. The current colour, point and shape number are displayed in the text window below the drawing.

Once both the objects have been drawn another sub-menu will appear giving you the option to join up the first and last points of the shapes or break them so that they are not joined up. The menu tells you whether these points are currently joined.

Once everything has been set up the computer takes control. Initially it draws your two shapes and joins each point to each corresponding point, ignoring invisible lines. This shows the path each point should take.

Then it asks you to press a key, and begins calculating the tweening. This is the slow part of the program.

Each point is moved, and its new location displayed on the screen as a shape. This screen is stored in memory for recall later. This process is repeated 13 times, and may take quite a while as each point is recalculated. On finishing, the program proceeds to animate the tweening at high speed.

Pressing < will slow the animation down and > will increase the speed. Pressing any other key will freeze animation, and transfer you to the last menu, which allows you to animate the tweening again (R), re-run the program with new shapes (C) or quit (Q).

If you don't want to type the points each time you run the program, Listing II adds load and save features to it. Unfortunately it also restricts the number of usable points to about 30.

To merge this new routine with Listing I type it in alone and list it to tape or disc using LIST"C:" or LIST"D:filename". Then load Listing I and merge the new lines using ENTER"C:" or ENTER"D:filename".

When you run the new program you will be prompted at the appropriate places to load or save sets of points if you wish.

Figure 1: To tween a five-sided object to a four-sided object

So that's how to tween one shape into another. You can create fascinating displays that will keep your friends mesmerised for hours.

Turn to Page 20
LISTING 1 BREAKDOWN

40 Sets up the machine code routines
50 Uses the subroutine at lines 5000 onwards for
input of shapes
120-150 Draw each shape, joining each relevant point, and
ignoring invisible lines
160-170 Wait for a key to be pressed
200-240 Calculate the size of the step for each point
250 Sets up the values which will make up the
points to the shape at each stage
260-280 Draw the first shape and stores it as the first
frame in memory
290-360 This is the main tweening part of the program
where 12 future frames are calculated
365 Uses the routine found at 2000 to animate
smoothly the stored frames
370-440 A simple menu
1000-1020 Two machine code routines for page-flipping
taken from the July issue of Atari User to give
smooth animation
2000-2090 Animation routine
5000-5590 Input the objects
5010 Sets up the size of the drawing area
5020 INPUTs the number of points, checking for
errors
5026 Sets up the x and y coordinates for the cursor,
the colour under the cursor and the colour
the current line will be drawn
5030 Dimensions the variables for the points of the
shapes
5035 Uses the subroutine at 6220 to draw a frame
for the drawing area
5052 Indicates which number point will be set
5055,5057 Show the current line colour if the second
shape is being drawn
5058,5059 Show which colour the line will be if you
press C when the first shape is being drawn

240 NEXT R
250 FOR R=1 TO P:PX(R)=AX(R):PY(R)=AY(R):NEXT R
255 GRAPHICS 1:SETCOLOR 2,8,8:COLOR 1
259 REM DRAW FIRST SHAPE
260 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)
=1 THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1)
:PY(T+1)
:PY(T+1)
278 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1)
:PY(T+1)
280 A=USR(1536,STORE=STORE+5
289 FOR R=1 TO 12
300 FOR T=1 TO P
310 PX(T)=PX(T)+H2(T)
320 PY(T)=PY(T)+V2(T)
330 NEXT T
340 GRAPHICS 1:SETCOLOR 2,8,8:COLOR 1
345 REM DRAW EACH TWEENING STEP
350 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)=1
THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1)
:PY(T+1)
361 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1)
:PY(T+1)
365 AUSR(1536,STORE=STORE+5
366 NEXT R
365 GOTO 2000
369 REM OPTIONS
370 ? "Repeat tweening,0 to Quit:"
375 POKE 764,255
380 OPEN #1,1,8,"GET #1,4,1:"CLOSE #1
390 IF A=96 THEN A=A+32
400 IF A=82 THEN 365
410 IF A=67 THEN RUN

press C when the first shape is being drawn

420 IF A=81 THEN END
440 GOTO 369
999 REM MACHINE CODE DATA
1000 DATA 104,104,104,141,25,6,169,72,
141,21,6,169,141,22,6,169,0,162,0,
189,72,153,153,0,141,232,288,247
1905 DATA 235,25,6,238,22,6,288,192,5,
200,234
1010 DATA 96,104,104,104,141,63,6,169,
72,141,6,169,141,6,169,0,162,
189,0,117,153,135,232,288,247
1020 DATA 235,63,6,238,6,169,0,192,5,
280,234,96
1995 REM DISPLAY TWEENING
2000 GRAPHICS 1:SETCOLOR 2,8,8:COLOR 1:
CHR$(125)
2001 ? "Press any key to continue...":
? "< and > to slow down or speed
up the TWEENING:POKE 764,255
2005 S=8
2010 STORE=66:FOR R=1 TO 13:AUSR(1577,
STORE=STORE+5:GOSUB 2850:NEXT R
2030 FOR R=1 TO 13:AUSR(1577,STORE=S:
TORE=STORE+5:GOSUB 2850:NEXT R
2040 GOTO 2810
2050 FOR T=1 TO S:IF PEEK(764)=255 THEN
M NEXT T:RETURN
2059 REM SLOW DOWN
2062 IF PEEK(764)=54 THEN S=S+1:POKE 7
64,255

? S+1
2068 REM SPEED UP 2070 IF PEEK(764)=55 AND S>0 THEN S=S-
1

From Page 19

Listing 1: Basic Tweening program

10 REM Tweening
20 REM by Simon Reason
30 REM (c) Atari User
50 REM SET UP MACHINE CODE
40 FOR R=0 TO 81:READ A:POKE 1536+R,A:
NEXT R
49 REM GET POINTS
50 GOSUB 5000
120 GRAPHICS 1:SETCOLOR 1:SETCOLOR 2,8,8:
STORE=66
125 REM DRAW SHAPES IGNORING COLOURS.
130 FOR R=1 TO P-1:PLOT AX(R),AY(R):DRAW
140 TO BX(R),BY(R):NEXT R
150 FOR R=1 TO P-1:DRAW TO BX(R),BY(R)
160 OR CHR$(25):"Press a key...":POK
E 764,255
170 IF PEEK(764)=255 THEN 170
200 MX=12:REM NUMBER OF STEPS
210 10%=S+1 TO S
220 MX*10%=S+1 TO S
230 NEXT R
240 NEXT R
250 FOR R=1 TO P:PX(R)=AX(R):PY(R)=AY(R):
NEXT R
255 GRAPHICS 1:SETCOLOR 2,8,8:
259 REM DRAW FIRST SHAPE
260 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)=1
THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1):
PY(T+1)
278 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1):
PY(T+1)
280 A=USR(1536,STORE=STORE+5
289 FOR R=1 TO 12
300 FOR T=1 TO P
310 PX(T)=PX(T)+H2(T)
320 PY(T)=PY(T)+V2(T)
330 NEXT T
340 GRAPHICS 1:SETCOLOR 2,8,8:
345 REM DRAW EACH TWEENING STEP
350 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)=1
THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1):
PY(T+1)
361 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1):
PY(T+1)
365 AUSR(1536,STORE=STORE+5
366 NEXT R
365 GOTO 2000
369 REM OPTIONS
370 ? "Repeat tweening,0 to Quit:"
375 POKE 764,255
380 OPEN #1,1,8,"GET #1,4,1:"CLOSE #1
390 IF A=96 THEN A=A+32
400 IF A=82 THEN 365
410 IF A=67 THEN RUN

Listing 1: Basic Tweening program

10 REM Tweening
20 REM by Simon Reason
30 REM (c) Atari User
50 REM SET UP MACHINE CODE
40 FOR R=0 TO 81:READ A:POKE 1536+R,A:
NEXT R
49 REM GET POINTS
50 GOSUB 5000
120 GRAPHICS 1:SETCOLOR 1:SETCOLOR 2,8,8:
STORE=66
125 REM DRAW SHAPES IGNORING COLOURS.
130 FOR R=1 TO P-1:PLOT AX(R),AY(R):DRAW
140 TO BX(R),BY(R):NEXT R
150 FOR R=1 TO P-1:DRAW TO BX(R),BY(R)
160 OR CHR$(25):"Press a key...":POK
E 764,255
170 IF PEEK(764)=255 THEN 170
200 MX=12:REM NUMBER OF STEPS
210 10%=S+1 TO S
220 MX*10%=S+1 TO S
230 NEXT R
240 NEXT R
250 FOR R=1 TO P:PX(R)=AX(R):PY(R)=AY(R):
NEXT R
255 GRAPHICS 1:SETCOLOR 2,8,8:
259 REM DRAW FIRST SHAPE
260 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)=1
THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1):
PY(T+1)
278 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1):
PY(T+1)
280 A=USR(1536,STORE=STORE+5
289 FOR R=1 TO 12
300 FOR T=1 TO P
310 PX(T)=PX(T)+H2(T)
320 PY(T)=PY(T)+V2(T)
330 NEXT T
340 GRAPHICS 1:SETCOLOR 2,8,8:
345 REM DRAW EACH TWEENING STEP
350 FOR T=1 TO P-1:COLOR 1:IF COL(T+1)=1
THEN PLOT PX(T):PY(T)=DRAWTO PX(T+1):
PY(T+1)
361 NEXT T:IF COL(T+1)=1 THEN DRAWTO PX(T+1):
PY(T+1)
365 AUSR(1536,STORE=STORE+5
366 NEXT R
365 GOTO 2000
369 REM OPTIONS
370 ? "Repeat tweening,0 to Quit:"
375 POKE 764,255
380 OPEN #1,1,8,"GET #1,4,1:"CLOSE #1
390 IF A=96 THEN A=A+32
400 IF A=82 THEN 365
410 IF A=67 THEN RUN
# COMPUTERWARE

**PO BOX 318, STOKE-ON-TRENT, ST6 6UX**

Brand New Software, Normally Despatched Within 24 Hrs!! Up to 20% Discount on latest titles!!

<table>
<thead>
<tr>
<th>TITLE</th>
<th>Case</th>
<th>Disc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Bear</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Alternate Reality 2</td>
<td></td>
<td>16.00</td>
</tr>
<tr>
<td>Alley Cat</td>
<td>7.80</td>
<td></td>
</tr>
<tr>
<td>Arbok</td>
<td>7.50</td>
<td>11.00</td>
</tr>
<tr>
<td>Astronauts</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>Amiga</td>
<td>9.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Auto Jamma</td>
<td></td>
<td>16.00</td>
</tr>
<tr>
<td>Battle Commando</td>
<td>8.00</td>
<td>12.50</td>
</tr>
<tr>
<td>Battle at Antaman</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>BWM Simulator</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Beautiful 2</td>
<td>8.00</td>
<td>12.00</td>
</tr>
<tr>
<td>Bounty Bob Strikes Back</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>Birthmark</td>
<td></td>
<td>24.00</td>
</tr>
<tr>
<td>Birthing Center</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>Caverns of Urgl</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Caesar Fort</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>Chimera</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>Colony</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>Conflict in Vamton</td>
<td>12.00</td>
<td>14.00</td>
</tr>
<tr>
<td>Colonel Conquest</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>Column-Bs &amp; C finns</td>
<td>9.00</td>
<td>12.50</td>
</tr>
<tr>
<td>Computer Ambush</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crystal Rocker</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Dorg</td>
<td>3.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Deception Rider</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Death Race</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>Deathwatch</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Decision in the Desert</td>
<td>12.00</td>
<td></td>
</tr>
<tr>
<td>Demon Dance</td>
<td>4.50</td>
<td>6.50</td>
</tr>
<tr>
<td>Dimension 3</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>Doomsday</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>Eco</td>
<td></td>
<td>20.00</td>
</tr>
<tr>
<td>Eclis</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Exit</td>
<td></td>
<td>8.00</td>
</tr>
<tr>
<td>Exit Right</td>
<td>12.50</td>
<td></td>
</tr>
<tr>
<td>Exit Right</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Fugger</td>
<td>2.70</td>
<td></td>
</tr>
<tr>
<td>F15 Simulator 2</td>
<td>38.00</td>
<td></td>
</tr>
<tr>
<td>Final Football of the Year</td>
<td>8.00</td>
<td>12.50</td>
</tr>
<tr>
<td>Fox Fist</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>Four Star Collection Vol 1</td>
<td>6.50</td>
<td>8.00</td>
</tr>
</tbody>
</table>

All software consists of a closest, brand new, original titles. Prices include post & packing (Orders of less than £6.00 in total please add 50p. Europe add £1.00 for 1st item then 50p for each additional item. Subject to availability, all items are usually despatched within 24 Hrs. Please make Cheques/Pois payable to COMPUTERWARE
THE single most common topic cropping up in your letters must be that of mistakes made when typing in programs. Many of you, can't seem to get to grips with our checksum program – particularly with LISTing your program, loading and running Get It Right and then having to re-load the original program before you can make any changes.

One or two of you have passed adverse comments about the speed with which the checksums appear on the screen.

Over the past few months your faithful technical editor has been working his way through all the letters' and comments on the subject and after much research – I can now proudly present the great new all-singing, all-dancing Get It Right! – Version II.

The first major difference is that GIR II is written completely in machine code for much greater speed. Also there is no need for you to constantly save and reload your programs since GIR II sits permanently in memory and is always ready for use.

In addition it does not require the use of page six – or indeed any of the zero-page locations – thus making it compatible with almost any program you might wish to type in.

The first thing you will need to do is type in Program I. This is a fairly simple Basic program which will create a boot cassette or autorun disc containing the GIR II routine itself.

We have printed – for the last time – the old Get It Right! checksum table so you can make sure that you have typed it in correctly. Don’t worry too much if you still haven’t mastered the old system, as this program will not continue if you’ve mistyped any of the data lines.

When you’re sure you’ve typed it correctly, run the program and you will be asked if you want to make a tape or disc version. Press C or D accordingly and the computer will prepare the machine code for that version. This will take about 45 seconds.

Cassette users should now place a fresh tape in the recorder and wind it to the beginning. When you hear two beeps press the Record and Play buttons followed by the Return key. The computer will create a tape version of GIR II for you, again taking another 45 seconds.

Disc users should make sure that there is a formatted Dos disc in drive one with at least 10 free sectors available for the AUTORUN.SYS file which will be created. This disc will become your new boot disc, so you should have already written the Dos files to it (Option H on the Dos 2.5 menu).

GIR II has also been designed to work with most types of Dos with a LOMEM below $3000 (such as DosXL or SpartaDos) so you may wish to alter the filename on line 3030 to suit your preferences. SpartaDos users, for example, could call it D:GIR.COM and access it only when required by typing GIR from the command processor.

From this point on you won’t need the Basic program again and you should always use your new Get It Right II master disc or boot tape each time you power up the system. The disc version is automatic – simply turn the computer on with that disc in drive one and Dos and GIR II will both load into memory.

Cassette users should place their new GIR II tape in the recorder, rewind it to the beginning and press Play. Then turn the computer on while holding down the Start button and press Return after the beep. Get It Right II will then load into memory and initialise itself.

After loading is complete you will see the message:

GET-IT-RIGHT-II – Loaded OK
followed by the READY prompt.

Obtaining a checksum from the new system couldn’t be simpler, either. After you’ve typed in the Basic program you wish to check you should enter the command:

LIST “G:”

and the checksum will appear. To stop and start it simply use the Control+c keys in the same way as you would with any other listing – or hit the Break button to abort it completely.

You can alternatively specify output to a printer by entering:

LIST “G:P:”

To show you the new type of checksum we have printed the ones for GIR II along with the old version on Page 26 after the program listings.

You will notice that each line consists of three parts. The first is obviously the line number in question, which is followed by a three digit checksum value. This may consist of both numbers and letters, but don’t worry – this time there won’t be any eights to confuse with zeros, or indeed any other tricky digits such as one and the letter I, zero and the letter O or two and the letter Z.

The final digit on the line (enclosed in brackets) is a special cumulative check digit. This gives the running total of the checksums given so far in the listing. Thus you can look down the listing until you find a mis-match with this last digit to help you find an error.

Any lines following one containing an error will also have the wrong final
AUTUMN ACTION
from
Red Rat

Out NOW

4 STAR COMPILATION Vol 1

Speed Run
Screen shot from ST version available early 1988

Out NOW

4 STAR COMPILATION Vol 2

Coming SOON!

Little Devil

NIGHTMARES

All titles are for Atari XL/XE
Disk £9.95
Tape £7.95

LEAPSTER

POTHOLE PANIC

Obtainable from your local software store or in case of difficulty direct from
Red Rat Software
11 FENNEL STREET, MANCHESTER M4 3DU. Telephone 061 - 834 4947
check digit, but if a given line is correct the three digit part of the code should always match that published with the program in question.

To make future typing easier for you, anything coming after a REM statement will be ignored by GIR II. Thus:

```
10 REM THE FIRST LINE
```

and

```
10 REM
```

would return the same checksum – CP1. However, don’t feel tempted to leave the line out completely as the program might use it in a GOTO or GOSUB statement.

You can even use GIR II to test individual lines – such as a block of DATA statements you have been having trouble with. To checksum a single line (say 1000) type:

```
LIST "G":1000
```

and to check a block of lines (say 100 to 500) type:

```
LIST "G":100,500
```

However, don’t forget that the cumulative check digit will be incorrect in such cases, as it can’t know what the values from the previous lines should have been. When checking selected lines of a program, ONLY use the main three digit checksum.

Both cassette and disc versions are protected from accidental user erasing – typing NEW or pressing System Reset will not harm them. In fact apart from the fact that your free memory space has been reduced by 882 bytes, you will probably never even notice it’s there.

Dos 2.0 and 2.5 users should note that loading the DUP.SYS command menu will overwrite the memory space used by Get It Right II. In order to retain GIR II when returning to Basic you should make sure that you have enabled the MEM.SAV facility on your boot disc (this is the default condition when using Dos 2.5 with a 130XE ramdisc).

So that’s it – our new, faster, and much improved checksum program. All listings from this issue onwards will be accompanied by the new checksums – so hopefully more of you will find it even easier to Get It Right!
<table>
<thead>
<tr>
<th>LINE CHSZM</th>
<th>LINE CHSZM</th>
<th>LINE CHSZM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 4441</td>
<td>2 871</td>
<td>3 5801</td>
</tr>
<tr>
<td>4 6213</td>
<td>5 9441</td>
<td>6 4579</td>
</tr>
<tr>
<td>7 871</td>
<td>8 4441</td>
<td>9 871</td>
</tr>
<tr>
<td>50 8101</td>
<td>100 11586</td>
<td>110 7576</td>
</tr>
<tr>
<td>120 8161</td>
<td>130 22219</td>
<td>140 4571</td>
</tr>
<tr>
<td>150 5950</td>
<td>160 3942</td>
<td>170 6026</td>
</tr>
<tr>
<td>200 6682</td>
<td>210 13024</td>
<td>220 3168</td>
</tr>
<tr>
<td>250 3802</td>
<td>260 2437</td>
<td>270 2506</td>
</tr>
<tr>
<td>300 1860</td>
<td>310 2433</td>
<td>320 3183</td>
</tr>
<tr>
<td>350 4352</td>
<td>360 3082</td>
<td>370 3574</td>
</tr>
<tr>
<td>400 5952</td>
<td>410 4328</td>
<td>420 4144</td>
</tr>
<tr>
<td>440 1628</td>
<td>450 5673</td>
<td>460 17598</td>
</tr>
<tr>
<td>500 2866</td>
<td>510 5195</td>
<td>520 4083</td>
</tr>
<tr>
<td>540 6777</td>
<td>550 7190</td>
<td>560 7056</td>
</tr>
<tr>
<td>600 4160</td>
<td>610 11488</td>
<td>620 9968</td>
</tr>
<tr>
<td>680 10457</td>
<td>690 13767</td>
<td>700 19478</td>
</tr>
<tr>
<td>720 10417</td>
<td>730 15732</td>
<td>740 10553</td>
</tr>
<tr>
<td>760 10552</td>
<td>770 13760</td>
<td>780 10577</td>
</tr>
<tr>
<td>800 12812</td>
<td>810 11346</td>
<td>820 11138</td>
</tr>
<tr>
<td>840 11598</td>
<td>850 11340</td>
<td>860 11367</td>
</tr>
<tr>
<td>880 11349</td>
<td>900 11341</td>
<td>920 12438</td>
</tr>
<tr>
<td>940 11342</td>
<td>960 12437</td>
<td>980 12331</td>
</tr>
<tr>
<td>1000 11343</td>
<td>1020 11342</td>
<td>1040 12429</td>
</tr>
<tr>
<td>1060 12428</td>
<td>1080 12427</td>
<td>1100 12426</td>
</tr>
<tr>
<td>1120 12425</td>
<td>1140 12424</td>
<td>1160 12423</td>
</tr>
<tr>
<td>1180 12422</td>
<td>1200 12421</td>
<td>1220 12420</td>
</tr>
<tr>
<td>1240 12419</td>
<td>1260 12418</td>
<td>1280 12417</td>
</tr>
<tr>
<td>1300 12416</td>
<td>1320 12415</td>
<td>1340 12414</td>
</tr>
<tr>
<td>1360 12413</td>
<td>1380 12412</td>
<td>1400 12411</td>
</tr>
<tr>
<td>1420 12410</td>
<td>1440 12409</td>
<td>1460 12408</td>
</tr>
<tr>
<td>1480 12407</td>
<td>1500 12406</td>
<td>1520 12405</td>
</tr>
<tr>
<td>1540 12404</td>
<td>1560 12403</td>
<td>1580 12402</td>
</tr>
<tr>
<td>1600 12401</td>
<td>1620 12400</td>
<td>1640 12400</td>
</tr>
<tr>
<td>1660 12400</td>
<td>1680 12400</td>
<td>1700 12400</td>
</tr>
<tr>
<td>1720 12400</td>
<td>1740 12400</td>
<td>1760 12400</td>
</tr>
<tr>
<td>1780 12400</td>
<td>1800 12400</td>
<td>1820 12400</td>
</tr>
<tr>
<td>1840 12400</td>
<td>1860 12400</td>
<td>1880 12400</td>
</tr>
<tr>
<td>1900 12400</td>
<td>1920 12400</td>
<td>1940 12400</td>
</tr>
<tr>
<td>1960 12400</td>
<td>1980 12400</td>
<td>2000 12400</td>
</tr>
</tbody>
</table>

**GIR using the program from August 1986 issue of Atari User**

1. **CAV (W)** 648 60K (X) 1280 512 (M) **Note:** 25K for memory.
2. **CAP (E)** 648 60K (W) 1280 4096 (K) **Note:** 25K for memory.
3. **CAL (M)** 512 128K (D) 1024 256K (P) **Note:** 25K for memory.
4. **CAM (A)** 648 60K (U) 1280 4096 (K) **Note:** 25K for memory.
5. **CAP (C)** 648 60K (O) 1280 4096 (K) **Note:** 25K for memory.
6. **CAP (D)** 648 60K (G) 1280 4096 (K) **Note:** 25K for memory.
7. **CAP (E)** 648 60K (F) 1280 4096 (K) **Note:** 25K for memory.
8. **CAP (F)** 648 60K (H) 1280 4096 (K) **Note:** 25K for memory.
9. **CAP (G)** 648 60K (I) 1280 4096 (K) **Note:** 25K for memory.
10. **CAP (H)** 648 60K (J) 1280 4096 (K) **Note:** 25K for memory.
11. **CAP (I)** 648 60K (K) 1280 4096 (K) **Note:** 25K for memory.
12. **CAP (J)** 648 60K (L) 1280 4096 (K) **Note:** 25K for memory.
13. **CAP (K)** 648 60K (M) 1280 4096 (K) **Note:** 25K for memory.
14. **CAP (L)** 648 60K (N) 1280 4096 (K) **Note:** 25K for memory.
15. **CAP (M)** 648 60K (O) 1280 4096 (K) **Note:** 25K for memory.
16. **CAP (N)** 648 60K (P) 1280 4096 (K) **Note:** 25K for memory.
17. **CAP (O)** 648 60K (Q) 1280 4096 (K) **Note:** 25K for memory.
18. **CAP (P)** 648 60K (R) 1280 4096 (K) **Note:** 25K for memory.
19. **CAP (Q)** 648 60K (S) 1280 4096 (K) **Note:** 25K for memory.
20. **CAP (R)** 648 60K (T) 1280 4096 (K) **Note:** 25K for memory.
21. **CAP (S)** 648 60K (U) 1280 4096 (K) **Note:** 25K for memory.
22. **CAP (T)** 648 60K (V) 1280 4096 (K) **Note:** 25K for memory.
23. **CAP (U)** 648 60K (W) 1280 4096 (K) **Note:** 25K for memory.
24. **CAP (V)** 648 60K (X) 1280 4096 (K) **Note:** 25K for memory.
25. **CAP (W)** 648 60K (Y) 1280 4096 (K) **Note:** 25K for memory.
I've had some fascinating letters this month – mostly from people with problems related to disc usage. Where have all the cassette users gone to – or don't you have any programming problems?

Anyway, let's kick off this time with a query from Michael Musculus from Cattaraugus, who is running an 800XL with two US Doubler 1060 disc drives and a Panasonic printer. He writes:

I am currently developing a relatively small program which deals with files and disc utilisation. I need to delete some information from a file which was saved earlier. For example:

```
10 DIM AS(28)
20 OPEN #1,B,8,"D:DATAFILE.DAT"
30 PRINT "ENTER DATA TO SAVE:";
40 INPUT AS;
50 IF AS="" THEN 70
60 PRINT #1,AS
70 GOTO 40
70 CLOSE #1
```

After typing RUN I can enter various words such as MICHAEL,HELLO or ATARI and they will be stored on the disc and the file closed. Now, using:

```
OPEN #1,12,0,"D:DATAFILE.DAT"
```

for both reading and writing at the same time, how can I erase specific information – such as the word HELLO – from the file?

Also, could you tell me exactly how the NOTE and POINT commands are used for Random/Direct Access to files and sectors?

Well, Michael, I'm not really all that surprised that you are having trouble with the NOTE and POINT disc access commands, as they are rather poorly documented in the manual. One would expect NOTE to return a useful value such as an offset into the current file (as does SpartaDos), but unfortunately – due to the limitations of the Dos 2.0/2.5 file structure – it can only return a sector/byte reference.

To try to calculate such values from scratch would be almost impossible, but luckily for you there is an easy way around the problem.

What you need to do, in effect, is to replace a single text string within your file with one containing blanks. This means that each time the string is read back with the INPUT #1 statement you will receive a null string – a string of zero length such as the one you searched for on line 40.

This will happen regardless of how many blanks there are because Atari Basic ignores any spaces following an entry – or in this case, ignores a complete entry composed entirely of spaces.

The solution could be a program along these lines:

```
10 DIM AS(28),REPLYS(3),SPACES28)
20 SPACES="";REPLYS(3),SPACES(28)
30 OPEN #1,12,0,"D:DATAFILE.DAT"
40 TRAP 500
50 NOTE #1,SECT,BYTE
60 INPUT #1,AS
70 PRINT "SHALL I DELETE "AS;
80 INPUT REPLYS
90 IF REPLYS="YES" THEN 50
100 POINT #1,SECT,BYTE
110 PRINT #1,"SPACES1,LEN(AS))"
120 GOTO 50
500 CLOSE #1:END
```

Let's take a look at how this works. Lines 10 and 20 set up the strings, including one which is filled with the same number of spaces as your maximum file entry length (in this case 20).

Then line 30 opens the file in update mode and line 40 sets a TRAP to line 500 to detect the end of the file. Incidentally, this would be more elegant if you used what is known as a wild entry or rogue terminator.

Put simply, you finish every file by writing a nonsensical entry – such as four asterisks – which you can look out for when reading the entries back in. This will tell you when there's no more data in the file.

Line 50 is the first clever bit. The NOTE command will return the current file pointer is terms of the sector number and the byte within that sector. Don't worry about the exact details because the numbers will only be used by the POINT command if we decide that we want to return to the same point in the file.

Lines 60 to 90 read in the entry from the disc and ask you if you want to delete it. If your reply is NO it will go back to line 50, get the new NOTE values for the next entry and do the whole thing again.

If, on the other hand, you enter YES at the prompt then the program continues to line 100 which will POINT the disc file pointer back to the previously NOTED position at the start of the unwanted entry.

Line 110 is probably the most complicated to understand, and it is this line which actually deletes the entry. As I have said, what we need to do is replace the current entry with blanks, but to do it character by character using the PUT command would take ages.

However, we already have the entry stored in memory as AS, so therefore we know how many characters need replacing. In fact, all we need to do is print out the same number of spaces as there are characters in AS. To do this, we use SPACES(1,LEN(AS)) – which means the portion of SPACES from the beginning of the string for the same number of characters as there are in AS.

Once this has been done we are back in position to read the next entry,
and the loop starts all over again at line 50.

This method has one small disadvantage — the entries are not actually deleted but rather overwritten. This means that the file will still take up the same amount of space on the disc even after you have deleted most of the entries.

To avoid this you could copy it, line-by-line, into a second file — missing out all the blank entries, of course. Simple when you know how, isn’t it?

‘Hidden’ space on disc

D.A. Richardson of Walsall in the West Midlands has worked out the quickest way to get my attention...

I read with great interest your articles on Dos and the operating system in relation to the formatting and sector allocation of a Dos disc — however I am very confused on a related point and hope you can help.

I do indeed use Dos 2.5 a lot, but I also occasionally choose to use SpartaDos 2.3b, particularly for economy of disc use.

The query I have is with the amount of storage space available to me on different discs. I usually use 48tpi discs, however I recently borrowed some 96tpi discs to determine whether there would be any advantage. I formatted the 48tpi disc and tried to transfer a large number of files — see how many it would take. After 47 files it gave me a “Disk Full” error roughly where I expected. Then I did the same with the 96tpi disk which promptly displayed over 1000 available sectors — and after transferring the same datafiles still showed over 700 available sectors.

However, this disc now won’t permit any other files to be transferred — once again displaying a “Disk Full” error.

Would you please be kind enough to explain why the directory shows available space which apparently cannot be used, and also what possible advantage it can be to use 96tpi discs when they don’t appear to store any more information than 48tpi ones?

Your problem stems from a slight misunderstanding over the way that discs work. The number of tracks per inch (tpi) specified on the label of a disc refers to the rated capacity of that disc — meaning that the suppliers won’t guarantee it beyond that point.

In fact, all 5.25 inch computer discs are manufactured in exactly the same way — it is only in quality control afterwards that grading occurs. The more data that can be squeezed safely onto a disc the higher its rating will be.

A standard, single density, 810 or 1050 drive will use 48tpi discs quite happily — and certainly won’t complain about using the higher quality 96tpi variety. However, it is only when you work in true double density (such as with a US Doubler) that a 96tpi disc will show its worth. And even then, most good quality 48tpi discs will cope quite happily with double density usage.

However, these figures only refer to the theoretical capacity of the disc — how much you can actually place on it is up to you when you initially format it.

SpartaDos, as you know, is capable of accessing almost any type of disc drive, with many possible formats. It can handle either single sided or double sided drives, with either 35, 40, 77 or 80 tracks per disc.

Unfortunately, Atari 810 and 1050 drives are only capable of using one of those eight options — Single Sided, 40 track. To obtain any of the others would require the addition of a complex interface and a completely different drive mechanism.

Now prepare your brain for action — here come the numbers: The three densities available with an Atari drive are all variations within the 40 track/single sided option: Standard density gives 18 sectors a track, each being 128 bytes long (that is 720 tracks or 92,160 bytes).

Enhanced (1050) density gives 26 similar sectors a track (1040 sectors or 133,120 bytes). Double density is slightly different in that it works with double-sized sectors, although it only uses 18 per track (giving 720 sectors again, but since each is 256 bytes long, a total capacity of 184,320 bytes).

SpartaDos obviously has no way of knowing when you select a drive type whether your hardware can fully support it.

For example, should you choose 80 tracks, double sided, using double density (256 byte) sectors, SpartaDos will assume you have access to the correct hardware and decide you have 80 tracks of 18 sectors on both sides of the disc. That’s 2,880 sectors — or 737,820 bytes — which is four times greater than the double density disc that the drive will actually create.

Now you see the problem — no wonder SpartaDos reckons there are more free sectors than there really are. In future, stick to 40 tracks, single sided and simply select Standard, Enhanced or Double Density modes.

As to what discs to use, 48tpi should be fine for most uses, but if you want to be doubly certain (no pun intended) use 96tpi for the higher densities.

Oh well, it looks like I’ve run out of space again. Don’t forget to keep those letters coming. See you next month.

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 88 Chester Road, Hazel Grove, Stockport SK7 5NY. We will answer as many as we can within the pages of Atari User but, unfortunately we cannot give personal replies.
Glad tidings for 16k adventurers

by Rouloc

I’m back again this month in one piece after my usual array of heroic deeds, saving maidens and slaying evil monsters and so on. There’s plenty to chat about, so fetch your ale and pull a chair about the fire and listen very carefully.

A lot of fellow travellers still have 16k machines and feel rather left out of things as far as adventures are concerned. Well, old Rouloc as usual is the bearer of glad tidings. A company called AD400 has produced some rather nice little adventures that will happily run in 16k of memory.

AD400 has made full use of the features of the Atari, and, by the judicious use of machine-code routines tucked away in odd corners, produced adventures which go no little way to matching the standards of those for the larger memory machines.

The games will also run in the bigger memory Atari 8 bit computers.

In order to squeeze them into 16k, the games have only a small number of locations (rooms) but that deficiency is made up by the fact that there are puzzles and problems at almost every step of the way.

The adventures are based on the exploits of Special Agent AD400. The two titles so far available are Escape Part 1 and Escape Part 2.

In Part 1, you are incarcerated in a foreign prison and must make good your escape.

In Part 2, having successfully escaped from the inner confines of the prison, you must complete your bid for freedom using objects acquired in Part 1. Part 2 cannot be played unless you have obtained a special password given on completion of Part 1.

Two further adventures, Island Incident and Egyptian Escapade, are likely to be ready by the time you read this.

The games cost £3.75 each for tape and £4.75 for disc.

Latest news from Infocom is that Plundered Hearts is its first venture into the world of romantic fiction. Grunt, my wall-eyed, seven-foot tall, heavyweight wrestler filing clerk has always got his raddled nose stuck into the latest Mills and Boon potboiler so should be well pleased. Breathless prose and true love conquers all are his meat and drink (next to body slams and Boston crabs).

The game’s main character is a young lady who has set sail on the high seas in the schooner Lafond Deux.

As well as losing her heart to handsome pirate captain Nicholas Jamison, our heroine faces less controllable events such as ravenous crocodiles, barrier reefs and dangerous explosives.

The author, Amy Briggs, has used her research into romantic fiction, 17th century sailing vessels and the dress of that time to weave a vibrant tale of passion and adventure.

Grunt is all agog but since stories of sighing and swooning are not my favourite bedtime reading, I shall suspend judgement until I have played it. I hope to review it very soon.
Hints & tips

STATIONFALL

- Have found an ostrich but need the ostrich nip?
  Look at the ceiling in the Pet Store.
- Can't get through the east or south connections?
  Have a look in the trash can in the printing plant.
- Documents not validated?
  Peep under the bed in the Commander's office.
- Village entry form too crumpled to be of use?
  Take it to the laundry room and iron it there.

THE PAWN

- Dragon difficult to bypass?

Draw his attention to something else by first looking at the shadows, then pointing at them and finally shining the white at them.

- Snowman an obstacle?
  Melt him with the white.

LEATHER GODDESSES OF PHOBOS

- Can't get past the ion beam on the canal?
  Send the barge ahead to the icy dock, then transport to it when you think it has arrived by using the black circle down the well in the oriental gardens.

- Want to kiss the frog but can't?
  Put the clothespin on your nose, put the balm on your lips, cover your ears with your hands and close your eyes. Now kiss the frog!

DEDICATED? So are we!

Don't get confused. PAGE 6 is a totally independent magazine for Atari users that will compliment and expand your Atari world.

* Long program listings – not just games but also utilities, applications, education and more in both BASIC and machine code

* Programming articles, hints and tips

* In depth reviews – would you believe we once devoted four pages to one review! That's in depth!

* Comprehensive ST section
  We also have a complete collection of PD software, books and accessories available to subscribers.

CHECK US OUT – you won't regret it.
£1 will get you a sample copy. £7 will get you a year's worth (6 issues) and a lot more besides!

Overseas subscriptions £10.50 Air Mail Europe
£16.00 Air Mail or £10.50 Surface outside Europe

PAGE 6, P.O.BOX 54, STAFFORD, ST16 1DR

SUBSCRIPTION HOTLINE
0785 213928
NEW LOW PRICE ST!

ONLY FROM SILICA

FINALLY, THERE'S A PC WITHOUT PROBLEMS WHERE OTHER COMPUTERS FALL DOWN. SILICA'S NEW Mini-128K PC IS DESIGNED TO BE THE MOST USEFUL MINI-MINI ON THE MARKET. IT'S A SERIES OF INNOVATIONS THAT MAKES IT THE PC THAT A LOT OF PEOPLE ARE LOOKING FOR!

ONLY FROM SILICA

FREE STARTER KIT - ONLY FROM SILICA

When you buy any Atari 512K, we will give you a FREE STARTER KIT worth over £50. This includes a FREE TALKING BOOK about what you can achieve with your new computer. It has over 50 free programs and games, plus over 120 free software titles included in the package.

DEDICATED SERVICE - ONLY FROM SILICA

At SILICA, we have a dedicated service department to support our Atari line of products. Our technical staff is trained and knowledgeable about all aspects of Atari's products, from hardware to software. We can provide you with the latest in service and support to ensure that your Atari system performs at its best.

1MB RAM UPGRADE - ONLY FROM SILICA

For those who need more memory, we offer a 1MB RAM upgrade for your Atari. This upgrade is available for both 512K and 1040ST models, and includes the necessary hardware and software to ensure smooth operation.

ATARI 1040STF - NEW PRICE

We are pleased to announce a new reduced price on the ATARI 1040STF, which is now available for only £399 (VAT included). This powerful computer is designed for business and professional applications, and includes a high-resolution monochrome or color monitor. It comes with a powerful processor, and includes a wide range of software to help you get the most out of your system.

MEGA ST's NOW IN STOCK

We are now stockists of the new MEGA ST series of computers, which includes two models: the MEGA ST and the MEGA ST+. These powerful systems are designed for business and professional applications, and include a range of software to help you get the most out of your system. We are also offering a special introductory deal for business users, which includes a free mouse and software bundle.

FREE CATALOGUE - ONLY FROM SILICA

Our free catalogues are available for download from our website, or you can request a printed copy from us. The catalogues contain detailed descriptions of all the products we carry, as well as information on pricing and availability.

FREE OVERTIME DELIVERY - ONLY FROM SILICA

For orders placed before 4pm Monday to Friday, we offer free overtime delivery to all major towns and cities throughout the UK.

PRICE MATCH - ONLY FROM SILICA

If you find the same product at a lower price elsewhere, we will match it. This includes both new and used products, and our knowledgeable staff will be happy to help you compare prices and find the best deal.

Please note that this offer is available only from SILICA, and is not applicable to any other retailer.

To: SILICA Shop Ltd, Dept ATUSR 1187, 69 The Mews, Hatherley Road, Sidcup, Kent, DA14 4XK

PLEASE SEND ME FREE LITERATURE ON THE ATARI ST

Me/Mrs/Mr: Initials: Surname:

Address:

Postcode:

Do you already own a computer?

If so, which one do you own?
Shut out the outside world... and lose yourself in a totally new dimension!

NOW you can experience all the fun and excitement of your favourite games without disturbing the rest of the household.

The SoundMaster consists of a cleverly designed interface and the very latest high-velocity lightweight headphones.

- The precision-engineered interface is encased in tough plastic with a graded volume control. It connects easily to your micro (leads included), and sits discreetly behind it while in use.
- The beautifully constructed stereo headphones are made by leading UK electronics manufacturer Ross. They deliver crystal clear reproduction and are fully guaranteed. They come with a special adapter so you can also use them with your personal stereo or hifi system.
- Every Sound Master is supplied in a colourful presentation pack together with detailed instructions to help you get the most from this superb device.

ONLY £14.99 (including p&p)

SOUND MASTER

Just what your micro's been waiting for!

DATABASE ELECTRONICS

Please send me the SoundMaster for my:

☐ BBC Model B ☐ BBC Master
☐ Acorn Electron ☐ Amstrad CPC (stereo sound!)
☐ Atari 8 bit (excluding Atari 400)

☐ Cheque enclosed payable to Database Electronics
☐ Please debit my Access/Visa no: __________________________

Expiry date __________________________
Signed __________________________

£14.99 (UK) £16.99 (Europe/Eire) £21.99 (Overseas)

Name __________________________
Address __________________________
Postcode __________________________

SEND TO: Database Electronics, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Order Hotline: 061-480 0171

Orders by Prestel: Key *89 then 814568383

MicroLink/Telecom Gold: 72:MAC001
GUNTER's rich uncle, Scrooge, has just died leaving his vast fortune to be split between his nephews. But Gunther is not happy to have only a share - he wants it all. So making his way to his uncle's mansion he plans to grab all the money before it's all shared out.

Type the game in and use the Get it Right! checksums to ensure that you have made no errors. As you can see, from lines 3500 onwards the game screens are defined in a way that makes them very easy to change, so you can easily invent your own to add an extra challenge to the game.

You'll find details of the numeric data lines in the program breakdown, and Table I shows the keys needed to obtain the graphics characters. Run the program and control Gunther's direction of movement using joystick or keyboard.

Pound coins are scattered all over the floor, but the real money comes in gold bags, each containing 100 gold coins. Collect enough of these before the time runs out and you receive a bonus and move to the next screen.

Unfortunately, Uncle Scrooge was rather security conscious and has left death traps lying around to catch burglars. You must also be careful to avoid Freddie the freak, a novel guard dog that Uncle Scrooge acquired cheaply from his old friend Doctor Steinfranken. That being said, the object of the game is to collect as much money as possible - so stay alert and be greedy!

<table>
<thead>
<tr>
<th>Character</th>
<th>How obtained</th>
<th>Represents</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Inverse + Control + C</td>
<td>Brick wall</td>
</tr>
<tr>
<td>E</td>
<td>Inverse + Shift + I</td>
<td>Death trap</td>
</tr>
<tr>
<td>1</td>
<td>Control + E</td>
<td>Coin</td>
</tr>
</tbody>
</table>

Table I: Characters in the DATA statements

Program Breakdown.

- **200**: Reads joystick or looks at keyboard, then moves Gunther
- **300**: Moves Freddie
- **400**: Prints bags of gold on screen
- **500**: Sets collision detection flags and updates the score
- **600**: Prints money, time and so on
- **700**: Completed screen routine
- **800**: Lost life routine
- **1000**: Game over routine
- **1200** - **1530**: Sound effects routines
- **1600**: Bonus points routine
- **2000**: Draws the title screen
- **2500**: Sets up variables
- **2520**: Redefines characters
- **3000** - **4495**: Draws game screens. The individual lines of numeric data (3695, 3895, 4095, 4295 and 4495) following every 20 lines of screen data contain the values for XF, YF, XFM, YFM, NO, XG, YG, XGM and YGM respectively. The use of these variables can be found in the variable list.

### CONTROLS

**Joystick:** Plugged in port 1 (fire to start game)

**Keyboard:**
- **Z**: Left
- **X**: Right
- **K**: Up
- **M**: Down
- **Space**: Start game

*Turn to Page 36*
From Page 35

Variables

SCREEN Screen number
MONEY Money collected
BAGS Bags left to collect
TIME Time remaining
LIVES Lives remaining
SKILL Skill level
BONUS Highest amount collected so far
HI Gunther's position
XG, YG Controls direction of Gunther (0 is stationary, 1 is forward, -1 is backward)
XFM, YFM Freddie's position
XY Controls direction of Freddie
X2, Y2 Number of forward steps Freddie makes
CO Used to keep track of Freddie's movement
SC Screen character to replace Freddie
SCR Temporary storage for SC
X8, Y8 Position of gold bags
DEAD Lost a life flag
B Collected a bag flag
S,G Used in the LOCATE command
START Start the game flag

800 SOUND 3, TIME=15, 10, 0: CO=0: IF CO =0 THEN XFM=XFM+YFM: YFM=YFM-N: IF CO=0 THEN XFM=XFM+YFM: YFM=YFM-N:
200 X8=X8+Y8: Y8=Y8-1: IF X8<17 THEN X8=X8+1: Y8=Y8+1: IF X8<17 THEN X8=X8+1: Y8=Y8+1:
400 X8=X8+Y8: Y8=Y8-1: IF X8<17 THEN X8=X8+1: Y8=Y8+1: IF X8<17 THEN X8=X8+1: Y8=Y8+1:
600 X8=X8+Y8: Y8=Y8-1: IF X8<17 THEN X8=X8+1: Y8=Y8+1: IF X8<17 THEN X8=X8+1: Y8=Y8+1:
800 X8=X8+Y8: Y8=Y8-1: IF X8<17 THEN X8=X8+1: Y8=Y8+1: IF X8<17 THEN X8=X8+1: Y8=Y8+1:

See page 37 for more information.
2630 POSITION 2,1: "D7;" 0,20,20,20: "X1;" 0,1,2,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1,4,2,1,2,1
How to get your Atari to talk to a BBC Micro
(or a Spectrum or a Commodore or an Amstrad or an IBM... or ANY other computer).

Language problems become a thing of the past when you join MicroLink. Now you can use your Atari (plus your telephone) to send messages to any other computer user, with no restriction on make of machine – or even on distance.

Details from 061-456 8383

NOAHSOFT
Present
PL65
FOR ANY 8 BIT ATARI WITH 48K RAM
A micro-processor program development language specified specifically for the 6502 processor that gives the power and flexibility of assembler without the headache.
PL65 is a procedural structured language that is designed to be used as a replacement for assembler. It is implemented as a single pass compiler which generates pure 6502 machine code output.

KEY LANGUAGE FEATURES
- 4 types of procedure PROC FUNC FUNC$ and INTERRUPT
- 4 primary variable types BYTE INT POINTER and STRING + absolute, BASED and arrays
- Structured program flow statements IF THEN ELSE ENDIF
- WHILE DO ENDWHILE
- REPEAT UNTIL/FOREVER
- FOR TODOWNT0 STEP NEXT
- CASE OF ENDIF ELSE ENDOCASE

ON GOTO
- unrestricted GOTO's for those who can't break the habit
- Syntax includes the complete set of 6502 mnemonics which can be interfaced with high level code for those who like code segments.
- much more much more.

PL65 allows you to create fast professional programs with high level statements producing code which is 60-100 times faster than BASIC and with the built in assembler even fast arcade games are possible (no royalties on runtime code). PL65 is supplied on disk with DOS 2.5 + KED a powerful word-processor style text editor which is packed full of features + Library support files including libraries for I/O, graphics, player-missile graphics, sound etc etc + 130 page programming manual.

All this and more for just £15.95
Send cheques or postal orders made payable to: Noaahsoft, 90 LONDON ROAD, DUNSTABLE, BEDS LU6 3EE

38 Atari User November 1987
WHEN the press release announcing the arrival of the Precision 4010 dot matrix printer proclaimed that it had four print heads, no one in the office believed it.

The printer itself arrived a week later and sure enough, there were four print heads mounted horizontally in line.

The theory is simple: if one print head travelling over 80 columns can produce 120 characters per second (cps), four heads travelling over 20 columns each will print at 480 cps.

To give you an idea of how fast 480 cps is, a 1000 word document which occupies about 6k of ram will take 26 seconds to print out in draft mode. In near letter quality (NLO) mode the print time is just under three minutes while a screen dump takes just under one minute.

As you can probably imagine, four times the noise is also generated, but the 4010 has a very effective top cover which reduces the decibels to an acceptable level.

The design seems to have been very well thought out. There is the usual bank of DIP switches for setting various modes such as carriage return with or without line feed, character sets, line spacing and so on.

Unlike most printers these are not tucked away at the rear of the case, they are on the front panel under a removable lid - and they can be set with human fingers not microscopic pin points. On the underside of the lid is a list of the switches' functions and how they were set at the factory.

NLO or draft mode, on or off line, form and line feed are accessed by push buttons on the main panel. LEDs indicate power status, NLO mode, paper out and ready.

The 40112 operates in IBM and Epson modes - selected by a switch. Although IBM mode won't be of much interest to Atari owners if you have been using an IBM printer and all your programs are configured to output to that machine, it means that you can plug in and go without having to load in new printer drivers.

Epson mode has all the facilities you would expect - normal Ascil, international characters and italics are all available in draft or NLO mode.

Both modes have pica and elite typestyles, condensed and double width printing styles and superscript or subscript facilities. All these options are software-selectable by sending the appropriate escape codes.

On the negative side there is very little to complain about - the only problems we experienced were caused by the multi-strike carbon ribbon. When we first set up the printer, the ribbon was prone to jamming as the thin carrier film would stick between the pinch rollers.

This problem was soon solved with the aid of a jeweller's screwdriver. The other problem was much more serious.

Doing the screen dumps caused me to join the Black Hand gang. The carbon "ink" didn't want to stay on the paper. It migrated on to my fingers, the printer case, the computer keyboard and various parts of my body.

Worse still, it smudged on the paper very easily. This resulted in more than one dump having to be redone. There doesn't seem to be much point in having a printer working at four times the speed if you have to use four times as much paper!

To be absolutely fair, we use a high quality paper with a very hard surface. The normal quality of fanfold paper has a more fibrous surface and may retain the carbon to a much higher degree. The option of a standard fabric ribbon would be a welcome accessory in this office.

With the exception of the ribbon problems, the printer performed exceptionally well over the review period.

The manual is supplied with the 4010 is very comprehensive. However, as it's printed in Japan, where the printer is made, there are a few examples of that special blend of Japanese/English which we have all come to know and love.

An example from page 96 reads: "Beside of the buffer conditions in paragraph (3), in case of printer status error (in such the case of paper out) occurs, the flag is set also."

Regardless of the above, there is more than enough information provided to allow you to get the most from your new printer. Items covered range from technical specifications, through installation procedures, software switches and escape codes to complete lists of available characters in both IBM and Epson modes.

For all the high technology, the cost of the 4010 is a very reasonable £424 - including Vat. Reliability should be high because each head is doing only a quarter of the work.

The specifications reveal that expected head life is 200 million characters and average output before failure is 10 million lines - although the printer head and ribbon drive unit (which must be the hardest working component), are excluded from this figure.

Product: Precision 4010 printer.
Price: £424.55.
Supplier: Precision Software, 6 Park Terrace, Worcester Park, Surrey. KT4 7JZ.
Tel: 01 330 7166.

Peter Hartley speeds up his printing helped by the latest technology.
Has upgrading your computer given you hardware you no longer need? Or have changing interests left you with unwanted software? Then THIS is the place to advertise your surplus items. Atari User readers are always on the lookout for a bargain and this is the first place they look!

An added bonus!
Your advert will also be automatically displayed on MicroLink, the electronic mail service operated in association with Telecom Gold. This means it will be seen by thousands of computer enthusiasts who can send an instant response.

- **Atari 130xe**, disc drive, printer cassette deck, software, books. Tel: Nigel 0822 46099 for more details and arrange a demo.
- **Wanted**: Centronics interface for 800XL. Tel: 0382 454475 after 6pm.
- **Atari 800XL**, 1050 drive, 1029 printer. £350 cash no offers. Tel: Leeds 0532 491237 ask for Kev.
- **I'm going to university** and have unused Atari 800XL, 1050 drive, 1029 printer, 410 recorder, joysticks, cartridges, 50+ software titles £250. Tel: Cholchester 0206 573654.
- **Brother M1009 printer** and Atari interface for sale. Also eight ribbons, roll paper holder and roll paper. All for £90. Tel: Farnham (0252) 713775.
- **Mapping the Atari** (revised) machine lang for beginners, 6502 mic for beginners. Will sell separately price negotiable. Tel: Fareham (Hants) 220087.
- **Stuck oh your favourite** game? We can supply hints, tips and maps. Send s.a.e. To: Brockford Hint, 28 Tremaine Grove, Hemel Hempstead, Herts for more details.
- **Atari 800XL** 1010 and 1050 disc drive + software £200. Tel: Livingston 0506 30194.
- **Atari 800XL** wanted due to desperation. S C Robins, 48 Cheltenham Mount, Harrogate, HG1 1DL.
- **1027 printer** £80, software on discs and cassettes all as new. Tel: 0288 418698.
- **Living Daylights, Inter Karate, Arkanooid, Gauntlet, Phantom, Spindizzy, Electra Glide**, Trail Blazer, Starquake, Spy v Spy, Green Beret, Hardball, Mercenary, Compendium, Dropout, £15 budget worth £190, sell £80. Tel: 041 772 8632.
- **1010 recorder and atari** french course £20. Original disc software for sale, prices from £5. Tel: Brentwood 216112.
- **Original cassettes software for sale**, many old time classics, s.a.e. lists to Greensward, Rowplatt Lane, Felbridge, East Grinstead, Sussex, RH19 2NY.
- **For sale Atariwriter** disc plus £22 worth of games on cassette for £30. Tel: 0656 724417 after 5pm ask for Brian.
- **Brand new MP165** lid printer, interface, Atewriter+, cost £270, sensible offers. Tel: Stewart (Portsmouth) 823880.
- **130xe and handbook** new boxed unwanted gift £85. Tel: 01 504 7652.
- **Cheap x1/ne games, word processors, utilities, tapes, discs available** due to upgrade, s.a.e. for list. Caley, Station Farm, Elmham, Dereham, Norfolk.
HAVE you ever wondered how much you still owe on your loan? You know how much you borrowed, the interest rate, and how much you are paying but the amount outstanding is often a mystery.

This program gives a rough guide to the answer. It can only be approximate because of the different ways interest is added – monthly, quarterly, half-yearly or annually.

It is based on the interest being calculated added on quarterly with the first addition one month after the loan was taken out. This gives quite accurate results when the results of the program are compared with bank loan figures.

When you run the program you have to give the program three values: the amount borrowed, the interest rate and the rate of repayment.

The amount borrowed should be in pounds, the interest as a percentage, and the repayment in pounds and pence. Sample figures for you to try are £1000, 12.5% and £333.39 and the loan will be paid in 3 years.

Once you've entered the figures you will be presented with data for the first year. You are reminded how much you borrowed, the rate and the amount you are paying each month, together with the following information:

Interest shows the amount added to what you owe. It's added each quarter and you'll notice that, providing you've entered realistic figures, it is less each time. This is because the interest is calculated on what you owe – and you're paying some off all the time.

Tot Paid lets you know how much you've paid all together. Tot Int gives the figure for the total interest you've paid to date. The difference between this and Tot Paid shows how much of your money has gone towards actually paying off the loan. Balance indicates the sum you still owe.

Once you've studied the figures for the first year, pressing any key will take you to the second and you can continue until the balance falls below zero which means the loan has been paid off.

The real use of this program is for checking the "What if?" possibilities of different repayments and interest rates where even the slightest changes can alter the time required for pay-off dramatically.

David Wilson helps you to computerise loan repayments
THE Atari 8 bit home computers have been around for a long time and their superb design makes them still one of the best, if not the best in my books. Internally their electronics has kept them at the top of a fluctuating market while lesser machines have vanished into total obscurity.

Many hardware add-ons have come and gone, but now Computerhouse have come up with one of the best internal modifications to an Atari I have ever seen.

One of the features of more powerful micros is that of the desktop, which allows you a multitude of different functions while running other software.

Now this is available to Atari 8 bit owners by installing the OS controller card. The package comes complete with a plug in board, a master disc of desktop utilities and a well-written manual.

The board is very compact but does require a fair amount of work to fit it. I would recommend that anyone thinking of buying a board sends their computer to Computerhouse who offer to fit it free.

Fitting involves removing the motherboard and desoldering two ICs. This is not a job for a novice, as you can cause a lot of damage if you haven’t got the proper tools and are not experienced in desoldering computer boards.

The chips you remove plug into the new board and so allow you control over the operating system. You then solder two sockets in their place and plug the board into one and attach a custom link lead to the other.

You then solder a read/write fly lead to a leg of the 6520 PIA chip before reassembling the micro.

The board has six switches that must be positioned outside the micro, so when you reassemble it you will have to have a think about where they should go.

For simplicity I left the lid off my computer. Once installed, you can use the switches to affect the way that it works. The settings are shown in Figure 1.

Let’s look at their functions and the way they affect the board’s features in more detail. The Deskelock protects the card from being re-programmed by a program as it is loading. This switch should normally be set off for most uses of the card.

Desktop ram mode is included for anyone who wishes to write their own utilities via a programming language such as MAC/65 Macro Assembler. The manual provided provides a full explanation of how to do this.

Desktop on/off alters the various utilities and system parameters when desktop software has been booted into the system. Basic on/off is self explanatory but a useful piece of information to know at this point is that some of the 61618 20 pin custom Atari ICs have a bug, so if you get garbage on the screen when you have selected Basic off then you need a new bug-free chip or don’t use this option.

Now on to describing the desktop features that come on the master disc. When you boot up the first menu you are presented with six features as shown below and each will bring up another menu from which different options can be chosen.

You can alter the system character set with the choice of 14 different sets. You can also alter a variety of system parameters including auto-scroll, key click, fast cursor and cassette baud rates.

The Super Dump II routine will dump the entire contents of memory to disc. It’s also possible to convert your existing multi-boot menus to a desktop resident menu or save the computer’s OS to disc to create a true emulator, or upgrade custom roms to work from the desktop.

For me one of the most useful and fun features of the board is the printer dumper. It creates an A4 sized dump and you have the option of selecting your own shades to represent one of the five primary colours.

There are three options: Draft, SHQ I and SHQ II. SHQ is a bit image equivalent of NLQ and gives a very high quality printout on machines capable of 216/m line feed. These features work on all Epson compatible dot matrix printers and are very easy to use. It is important to have the deskelock switched off.

You can analyse the contents of a

---

**Figure 1: The switch settings**

<table>
<thead>
<tr>
<th>Desktop control</th>
<th>Basic control</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Desktop</td>
<td>1 Basic disabled</td>
</tr>
<tr>
<td>B Desktop ram mode</td>
<td>2 Basic enabled</td>
</tr>
<tr>
<td>C Desktop on</td>
<td></td>
</tr>
<tr>
<td>D Desktop off</td>
<td></td>
</tr>
</tbody>
</table>
Disc and dump the results to a printer. There is also the format option that will initialise your discs in single density. Once you have configured the OS parameters you can create a boot disc which you can load everyday you require these settings.

It is possible to initiate a coldstart from the main menu, and this allows you to load software into the system with the desktop software resident.

These are the features that you get when you first buy the board, but one of the great things about it is the fact that it is software controlled and so is only limited by the quality of programs available for it. This means that although the card is a hardware modification it is extremely expandable and very easy to use.

In the parcel that I received to review were two library discs – the 1029 Snapshot printer dumpers and the SHO professional print link package.

The former is similar to the snapshot routine, but is designed for the Atari 1029 printer – which is so often left out in the cold. Computerhouse says that the other library utility gives a printout on an Epson 8 pin dot matrix printer with reverse line feed that can only be rivalled by a laser printer.

I tested the printout quality and it is superb. Boasting that it rivals a laser printer is a little naughty, but it is certainly one of the best dumpers routines I have seen on an 8 pin Epson.

There are three variations of graphics converters on the disc. The first is for use with Typesetter desktop publishing software packages, the second is for use with Lister/Picture software and the final one is designed to for use with Microsoft Word to give enhanced quality on text printouts.

It is important to note that the library discs do not come in the original package and must be bought off Computerhouse for £12.95 for the Snapshot and £16.95 for the print link package.

I have seen just about every add-on for the Atari 8 bit computers on the English and American markets and must rate this one a winner. It is very well documented and easy to use.

At the moment Computerhouse is designing more library discs. The first will be a printer toolkit which will use the 130XE’s 128k memory as a printer buffer, a colour screen dumper for the Epson JX-80 printer and a variable size screen dumper that will allow you to print whatever you want on the paper.

There will also be a general purpose disc that will have all sorts of interesting utilities like a clock, a notebook, calendar and appointment menu and a redirector that will allow you to play around with your handlers and send screen data to a printer or a ramdisk. So if you feel like turning your poor old computer into a new super computer then this is the product for you.

---

**Product:** OS Controller Board
**Price:** £89.95 (800XL), £79.95 (130XE), £99.95 (optional OS switch pack)
**Supplier:** Computerhouse, 14 Romilly Court, Landridge Road, Fulham, London, SW6 4LL
**Tel:** 01-731 1276

---

**Confirmation of new character set installed**

**Screen dump from an AtariArtist picture**
MINI-DOS
from T. Mahon

This performs six of the functions of DOS 2.5 saving you from going to DOS each time you want to perform a simple DOS function. If DUP.SYS is removed and Minidos put in place it saves 36 sectors on the disc. Some lines may need abbreviations in order to fit them in. When typing the question marks, in line 10 type the inverted commas directly after. Use G. instead of GOTO and GOS. instead of GOSUB. The routine gives you the following functions:

- **Dir**: Displays directory of drive specified and must be followed by a number from one to eight.
- **Delete**: Deletes file(s).
- **Lock**: Locks file(s).
- **Unlock**: Unlocks file(s).
- **Rename**: When the program prompts for a filename type D: followed by the file you wish to rename followed by a comma and finally the new name of the file. For example:
  - D:MINIDOS.5L.B,MINIDOS
- **Format**: With DOS 2.5 there are two types of format and both of these have been included in Minidos. To stop you from accidentally erasing your discs, Control must be pressed with S or E which specifies SINGLE or ENHANCED density.

```plaintext
100 DIM B$ (26752), A$(11): B$ (26752) = "FO
R R = 1556 TO 1568: READ A$: POKE R, A$: NEXT
R: FOR R = 1 TO 4: GOSUB 2: GOSUB 4: NEXT R:
END: DATA 1B, 252, 45, 228, 96
2 "INSERT SOURCE": INPUT A$: POKE 776

82: C = 0: FOR T = 256 TO (R + 1) 256: A$ = B$(B$)$ : FOR C = 0 TO 256: POKE 776, T - (INT (T / 256) + 25

6) 5 POKE 779, INT (T / 256): POKE 772, A$(1 + 256)$ : POKE 773, INT (A$(1 / 256)$ : A$ = USR$(156) : C = 0: NEXT T: RETURN
4 "INSERT DESTINATION": INPUT A$: POKE

8: T = 0: FOR T = 256 TO (R + 1) 256: A$ = B$(B$)$ : FOR C = 0 TO 256: POKE 776, T - (INT (T / 256) + 25

6) 5 POKE 779, INT (T / 256): POKE 772, A$(1 + 256)$ : POKE 773, INT (A$(1 / 256)$ : A$ = USR$(156) : C = 0: NEXT T: RETURN
```

**PROGRAM BREAKDOWN**

1. **Initialization**: Sets up the buffer space ($B$), reads in the machine code and controls the FOR...NEXT loops that jump to the subroutines.

2, 3. **Read source subroutine**: Displays a prompt for the source disc to be put in drive #1, and then POKEs 770 with 82 (the READ command). It then uses another FOR...NEXT loop to fill up the buffer space, using 778 and 779 as the sector to be read, and 772 and 773 as the address of the buffer.

4, 5. **Write destination subroutine**: Displays a prompt for the destination disc to be put in drive #1, then it POKEs 770 with the WRITE command (97) and then POKEs 778 and 779 with the destination sector number, and 772 and 773 with the address from where the 128-byte sector will come from.

**Get it right! II**

1 94K (8)
2 20K (6)
3 8K (2)
4 8K (2)
5 8K (2)

44 Atari User November 1987
MINI-PACMAN II
from Mark Phillips

In the September issue of Atari User there was a five liner called Mini-Pacman by Robin Edwards. Here is another based on the original idea, but with some extras.

The original was well written, but the display suffered from being small and devoid of colour because it runs in text Mode 0.

This Mode 18 version gives a full screen display and four colours while retaining Mode 0 text. The characters are also repositioned on screen to give a neater effect. To enter the program, you must use the abbreviations shown:

POKE PO.
GRAPHICS GR.
LOCATE LOC.
SOUND SO.
POSITION POS.
NEXT N.
INPUT IN.

Omit all spaces where possible and note that there are nine spaces between the quotes in line 5.

PASSWORD
from Chris Read

In the world of mainframe computers and communications it is usual to have to enter a password when you start. This program can be added to the beginning of your program to make it necessary for a user to enter a password before it will execute. In the program the password has been set to YOURWORD, but you can change this to any combination of eight letters, numbers or control characters of your choice. Just replace YOURWORD in line 10 with what you want.

For those of you who wish to use this as a security measure rather than a bit of fun you will have to take extra precautions to stop the program being listed. For example, changing the END to NEW in line 20 will cause the program to be deleted from memory if three unsuccessful attempts are made - but don't forget to save it first.

The program makes use of the Atari's ability to accept words such as PASSWORD and TRIES as variable names, which I hope makes the programming easier to understand. Typing in the program is straightforward and only PRINT is abbreviated.

PROGRAM BREAKDOWN
10 Dimensions variables and OPENs keyboard for the GET command.
20 Draws screen and implements TRIES.
30 POKEs 764,255 to clear keyboard buffer before the GET command. Converts the Ascii number of the keypress into a character using CHR$ and places it in the ENTRYS string.
40 If ENTRYS<->PASSWORD THEN position 1,4,7 (with PASSWORD Incorrect) FOR DELA Y=1 TO 2000:NEXT DELAY:GO TO 20
50 Prints a message.
110 Dim PASSWORD(2),ENTRIES(2):PASSWORD ="YOURWORD":TRIES=0:GRAPHICS 18:POKE 712,2:OPEN #1,"A",":"
20 Position 1,4,7 (with PASSWORD Incorrect) FOR DELAY Y=1 TO 2000:NEXT DELAY:GO TO 20
50 Position 2,4,7 (with PASSWORD Incorrect) FOR DELAY Y=1 TO 2000:NEXT DELAY

Simply send a copy of the program on disc or tape together with the documentation - preferably as a word processed file - to:
Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY.

Win £25

If you've written any useful or interesting five line programs why not send them to us to grace our pages? We pay £25 for each one published. You should give a full description of the routine and any other details that are relevant. And remember if you want your material returning please enclose a suitably stamped package.
Mini Office II

6 powerful home and business programs in just ONE package – at a price that simply can't be matched!

Voted Business Program of the Year – 1985 AND 1986
Popular Computing Weekly
'This package is incredible value'
Daily Mail Home Computing Guide

WORD PROCESSOR
Compose a letter, set the print-out options using embedded commands or menus, use the mail merge facility to produce personalised circulars – and more!

SPREADSHEET
Prepare budgets or tables, total columns or rows with ease, copy formulae absolutely or relatively, use a wide selection of mathematical and scientific functions, recalculate automatically – and more!

DATABASE
Build up a versatile card index, use the flexible print-out routine, do powerful multi-field sorting, perform all arithmetic functions, link with the word processor – and more!

COMMS MODULE
Using a modem you can access services such as MicroLink and order a wide range of goods from flowers to software, send electronic mail, telex and tele-messages in a flash – and more!

GRAPHICS
Enter data directly or load data from the spreadsheet, produce pie charts, display bar charts side by side or stacked, overlay line graphs – and more!

LABEL PRINTER
Design the layout of a label with the easy-to-use editor, select label size and sheet format, read in database files, print out in any quantity – and more!

ORDER FORM
Please send me Mini Office II for the Atari 400/800/XL/XE (48k required), on 5¼" disc for £19.95

I enclose cheque made payable to Database Software, or debit my Access/Visa card:

Exp. date
Signed
Name
Address

ORDER HOTLINE:
TEL: 061-480 0171

SEND TO: Database Software, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY
CONGRATULATIONS on your superb magazine. I have been an Atari User reader for a year and a half now, and have enjoyed the games, utilities and practical hints, which I have found very useful. Keep up the good work.

I have had my Atari 800XL for more than a year. In the July 1987 issue of Atari User, I found two errors - one in each of the games. The first one is on line 1820 of Moneybags. Although I have heard from the magazine many times that the lists are listed correctly, I am afraid this time something must have gone wrong. The line reads:

1820 READ J:IF J=1 THEN 1850

There is unfortunately no line 1850 and the result is an error 12. The line should read:

1820 READ J:IF J=1 THEN 1860

You couldn't have been expected to notice the second error but in Bounder the program runs perfectly except for one occasion. When you're using the two players option, if you play badly on round three and you are player number one and you happen to kill both men before using up your darts, the program goes to the end without giving player two his turn on round three.

I have corrected this by making the following small adjustment:

182 IF Y>15 AND Y<185 A NO AP(N) THEN YB=6:AP(N)
  =N:AP(N)=A=AP(N):=TMA=11:G
  010 195
183 IF J=1 AND Y=169 A NO AP(N) THEN YB=14:AP(N)
  3=N:AP(N)=AP(N)=AP(N)
  =BMA=11:GOTO 195
184 IF ROUND=3 AND TMA=1
  AND BMA=1 THEN TMA=1:DMA
  N=89:READ 1:RETURN
194 GOTO 195

This may not be the best way of curing it, but with my limited knowledge of Basic

Where the Bounder can go wrong

it is the best I can do for now. And it seems to work all right. - J.D. Tyler, Eltham, S.E.9.

* Our listings are taken from working versions of the program, but unfortunately in the case of Bounder we removed the "unnecessary" REMs after testing, so the slight error occurred.

Double trouble

I HAVE got an Atari 1050 disc drive. A few months ago I had a Doubler fitted and for a few months it was fine. Then last week it started to play up and now it won't write or format discs.

Could you tell me what is wrong with it or tell me what to do with it. - David Dickinson, Crewe, Cheshire.

* The trouble could be a fault in the FDC (Floppy Disk Controller) chip inside your drive. This is soldered in, so it would be best if you have your drive checked by a competent dealer.

Wandering addresses

I READ with interest, in the August issue of Atari User, the article Mailmerge written by Louise Collinson. I was, as it happens, in the middle of producing a personal mailing list for my own private use - letters plus labels and so on.

While doing this, I had run into difficulties trying to set up the master letter blank to be used with the database file because I wanted to print the two addresses on the same line, one on each side of the page. As the addresses varied from letter to letter in length per line so the other moved in sympathy.

The solution is that when you set up your address data record be careful to set an adequate and equal field size for all the fields to be used in the address.

When supplying information to each record field in the database, you must use all spaces allocated to ensure that your addresses have a standard length.

In the word processor the only further adjustment necessary is to allow for variable length fields of embedded commands and this is simple to adjust when using the preview mode. In addition I also allow extra fields of the same length for possible future use. You can criticise this as a waste of valuable memory, but normally the availability is more than adequate. I hope this proves to be useful and informative to anyone starting to put Mini Office II to work as, increasingly, I intend. - D.M. Hill, Stranraer, Wigtownshire.

Polish winner

I AM one of the prize winners in the Atari User Birthday Contest. I am very pleased because here in Poland, in my town Olsztyn, it is rare to have such luck. Unfortunately there is a mistake in the spelling of my name: It should be Gryzybek.

Thank you very much for the correction of my name. - Antoni Gryzybek, Poland.

Tricks of the trade

I THINK Atari User is excellent and it almost couldn't be better. But it would be perfect if you could devote a page or so to PEEKS and POKEs, because I would like to know as many tricks as possible and as you know these provide many interesting effects.


* To get Start working as you want you must PEEK location 53279 to see if one of the function keys has been pressed. If, when you PEEK the location, you find a 3 then Option has been pressed, a 5 indicates that Select has been pressed and a 6 means Start was pressed.

Here is a simple program to start your game:

10 PRINT "Hit the START key to begin"
20 IF PEEK(53279)=6 THEN GOTO 40
30 GOTO 20
40 PRINT "THE GAME HAS NOW STARTED"

The program sits in a loop looking at location 53279 waiting for a key to be pressed. By adding other lines to look for a 3 or a 5 you can use the various options available.

Do any of our readers

Turn to Page 48
 Cricket on the 800XL

PLEASE could you let me know if any cricket games have been released for the Atari? I have a 800XL. - R.E.B Harding, Evesham, Worcs.

- To our knowledge no cricket games have been released for Atari 8-bit computers. Have any of our readers written one that we could publish in Atari User?

Run-Time Library

I HAVE had my Atari for four years now and I've done most of my programming in Basic, as I found machine code too complicated.

After reading your review of Action! by OSS I decided to buy it. When it arrived I immediately plugged in the cartridge and hunted through the manual for a program to try. I was very impressed with the speed the program ran.

Since then I have written a game, and a sprite designer and I am currently writing a space trading game. The only problem is that my programs won't run without the Action! cartridge plugged in.

You mentioned a Run-Time Library in your review.

Is this part of the Action! toolkit? If not, could you please tell me where I could obtain the Run-Time Library from? - Mark Strefford, Flint, Clywd.

- The Action toolkit and Run-Time Library are two separate packages.

- The toolkit is a selection of useful programming routines to give features like floating point maths and player sprite graphics.

- The library program allows you to create a free standing, self contained file that will execute without the Action! language cartridge. The packages cost about £29.95 each.

Interface needed

I AM an Atari 130 XE owner and would like to know why so many games on the 8 bit Atari are only for 48k machines.

I know that the old 400/800 machines only have 48k or less, but if the programmers could write software for 64k computers then we XE/XL owners would have much more value for our money. The games could then have much better graphics than many have today.

The solution could be that Atari build a cartridge/interface to give the old 400/800 computers 64k of memory. And when the old machines are 64k then the program makers could do some software like Road Runner, Last Ninja and so on.

Are there any other readers who have the same thoughts as me? - Niclas Bjorkholtz, Sweden.

Using GAD pictures

AFTER recently buying Graphics Art Department I decided I would like to use some of my pictures in my own Basic programs. I noticed the Five Liners program to do this in the September issue of Atari User and typed it in.

Then I changed the filename to the name of the picture and tried to run it, but all I got was error 176. It seems to be that GAD and DOS 3 require different formatted discs. How do I save a GAD picture on to a DOS 3 formatted disc? - Dave E., Brighton.

- GAD loads and works using Dos 2.5. Either use dos 2.5 or transfer GAD picture files to Dos 3 using the utility that comes with Dos 3. Have any of our readers written a Five Liner to do the job more easily?

International characters

ANYONE who has purchased Mini Office II will by now have discovered what an excellent package it is. The following information may assist users who haven't yet worked out how to underline and use the International character set so you can write Dear André Willey and so on.

To underline set, one of the control strings, say P2, to 27,25. This switches on the underlining and to turn it off set P3 to 27,26. To use the underlining feature put P2 at the beginning of the text you wish to underline by pressing Control+1 and put P3 at the end to switch this feature off.

International characters are obtained by using the Ascii value in a control string starting with 27,23. For example to get é set the string code to 27,23,20.

If you propose to use the international character set a lot it's worth making a French set, German set and so on and save a version of each. Also, do not overlook that you can use the selective search and replace to change any character to é for any documents that have already been created.

- Mike Rooke, Durham City.
Secret of the 1010 deck

I found Mini Office II a very interesting and useful piece of software. Unfortunately it doesn't support my Atari 1010 printer/plotter, and when I use the graphics module it isn't possible to send the screen display to the plotter.

Do you know how I can make my plotter dump the screens? – Noel Passchijn, Deynck, Belgium.

For printers that it does not support directly, Mini Office II allows you to save graphics screen to disc by selecting the Option icon and then Disc Save from the next menu.

The saved screen can then be dumped using any screen dumps.

Many of your readers have reported problems they encountered while attempting to load tapes with the 1010 tape deck.

The secret to reliable operation is to clean not only the tape heads but also the capstan and pinchwheel. To do this press play on the deck and use a cotton bud sprayed with a suitable cleaner – I use R.S aerosol cleaning fluid which is available from good dealers.

Other electrical cleaning sprays may be suitable, but check that they do not contain any lubricant. The heads can be cleaned with an up and down action of the brush.

Once you have cleaned the heads go to Basic and type POKE 54018,32 to activate the tape transport motor.

The capstan – the vertical steel rod – and the pinchwheel – the rubber wheel pressing against the capstan are to the right of the heads and both should be cleaned with the sprayed bud until the brown tape oxide has been removed.

Note that the bud will continue to pick up a black deposit from the pinchwheel even after it is clean. This cleaning will do much to restore reliable operation, whereas a fabric tape cleaner will only clean the heads.

If you are handy with a soldering iron you may like to try another fix, but this should only be tried if the deck is out of warranty.

Unscrew both halves of the case and unplug all the connectors from the board before removing it from the base.

Locate resistors R111, R112, R113, R114, R115 and R159 (their numbers should be printed on the board), and replace them with resistors of the same value but of 1% tolerance.

Since these resistors control feedback loops in the FSK decoding filters, replacing them with more accurate values should improve performance in this vital area of the circuit.

I will also echo previous warnings about tampering with the head alignment, since this requires the use of a azimuth tape and special equipment.

Other methods of alignment are made horrendously difficult by the appalling playback quality – particularly through the average TV speaker.

Finally, a word about the tapes themselves. It is poor economy to buy cheap tapes which will probably then refuse to load.

Also do not use chrome, pseudo chrome or metal tapes which can destroy the tape heads over a period of time. – Derrry Croker, Watford, Herts.

Machine code entry

I am interested in programming in machine code and I'm willing to give it everything! But I have been told I will need an assembler and an editor. Please could you tell me how to obtain these, and any books that will be useful.

Is this all I will need or am I skimming the surface? – Peter Barry, Birkenhead, Merseyside.

The easiest way for you to get into machine code programming on your Atari is to buy an Atari Assembler/Editor Cartridge. This plugs into your computer and comes with an easy to understand manual and instruction card. You will also need to obtain a few tutorial books and watch future issues of Atari User for a new series on easy programming using machine code.

Rare cartridges

Please can you tell me where I can get cartridges for my Atari 800XL? I live in Devon and I have had the computer for nearly two years now and I still can't find cartridges around where I live. – Simon Legg, Axminster, Devon.

Unfortunately the supply of cartridges for Atari computers has dwindled recently, but with the introduction of the new 65XE game console there should be a new surge in cartridge-based software coming out.

Stuck with the keys

I bought a game for my Atari 800XL not realising it was keyboard control. Is there any way of typing in the command for joystick control and if so would you please tell me? – Barry Mitchell, Liverpool.

Unfortunately games need writing specially to accept joysticks rather than the keyboard. It's unlikely that you could convert any game you have bought.

Saving programs

Please could you tell me how to save programs on to tape, because when I type programs into my computer I would like to record them to play in the future.

Also could you tell me if you sell copies of the games you print in Atari User and tell me how much you sell them for? – Martin Boyle, Stockton-on-Tees, Cleveland.

Once you've typed your program in just type:

CSAVE

Then to load the program enter:

LOAD

It's a good idea to save your work about every half hour. Then if anything goes wrong, such as a power cut, at least you can re-load the last saved version and carry on typing it in. We don't sell the games on disc each month, but you'll find an offer in this issue of Atari User for ten of the best games previously published.
Two discs crammed with the most popular programs from your favourite magazine!

These two exciting compilations bring together some of the very best listings from the pages of Atari User.

Whether you like games or prefer more serious pursuits there's something here for you – and you can also learn a great deal from examining and modifying the Basic listings.

Ten of the Best Games

- **Chopper Rescue** – Take command of a helicopter to rescue lost soldiers
- **Des Bells** – Rescue Esmerelda by negotiating the dangerous obstacles
- **Spacemaze** – Fly your spacecraft through the deadly caverns below the lunar surface
- **Mazemunch** – Guide your munch monster around the maze, avoiding its deadly inhabitants
- **Moneybags** – Gobble up all the money but beware of the sinister spiders
- **Frank the Fruit Fiend** – Help Frank eat his favourite food in this platform game
- **Duck Dash** – Dash round and chase up all the ducks before the storm hits the farm
- **Frogjump** – Direct the frog across the busy road in this classic arcade game
- **Doctor Boris** – Help the doctor build the new hospital, but watch out for mad Norman

PLUS the latest Get It Right! program to help you correctly type in listings in Atari User.

Ten of the Best Utilities

- **DiscError** – Make sense of those Basic error numbers by turning them into words
- **DiscEdit** – Modify those hidden sectors with this superb utility
- **DiscView** – Take a look at all the useful information stored on your discs
- **Dump 15** – Make prints of your favourite pictures on your Epson or Atari 1029 printer
- **ArtShow** – Load your AtariArtist pictures and create your own fantastic artshow
- **AutoDirectory** – Gain instant access to disc directories without going to Dus
- **DiscRenumber** – Renumber your Basic listings with this useful Autoboot program
- **Fullprint** – Print out any resident character set in full to an Epson printer
- **DataEditor** – Manipulate data with ease whether on disc, cassette or in memory
- **80 Column** – Generate a very impressive 80 column text display on your screen

PLUS the latest Get It Right! program to help you correctly type in listings in Atari User.

ONLY £4.95 each

... or just £1.95 each when you take out a new subscription to Atari User – or if you renew your existing subscription.

TO ORDER PLEASE USE THE FORM ON PAGE 51
**Protect your Atari.**

with this luxury dust cover for your Atari XE or XL.  It's made of clear, water-resistant vinyl and bound with strong cotton

**Only £3.95**

... and your Atari Users

A year's supply of Atari User can be kept in this handsome chocolate brown binder

**Only £4.95**

**Secure storage for your discs**

The ideal storage medium for your 5.25in discs.

The luxury padded PVC boxes are strongly made to protect your valuable discs and can be packed flat when not in use.

Box holds up to 60 5.25in discs

**£4.95**

---

**Order Form**

<table>
<thead>
<tr>
<th>Valid to</th>
<th>30/11/87</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Special price if accompanied by subscription or renewal</strong></td>
<td></td>
</tr>
</tbody>
</table>

All prices include postage, packing and VAT

Overseas orders dispatched by Airmail.

| **Annual subscription** |
|---|---|
| **New** |
| UK £15 | 7001 |
| Europe (incl. Eire) £18 | 7002 |
| Overseas (Airmail) £33 | 7004 |
| Commence with | Issue |
| **Renewal** |
| UK £15 | 7002 |
| Europe (incl. Eire) £18 | 7001 |
| Overseas (Airmail) £33 | 7002 |

| **Back Issues** |
|---|---|
| January 1987 | 7409 |
| February 1987 | 7410 |
| March 1987 | 7411 |
| April 1987 | 7412 |
| May 1987 | 7413 |
| June 1987 | 7414 |
| July 1987 | 7415 |
| August 1987 | 7416 |
| September 1987 | 7417 |
| October 1987 | 7418 |

| **Mini Office II** (see page 46) |
|---|---|
| Disc 400/800XL/XE | £19.95 |
| Disc 1900/4000 | £22.50 |
| Disc 8000 | £25.00 |

Add £2 for Europe/£5 for Overseas

| **The Sound Master** (see page 34) |
|---|---|
| NOT suitable for Atari 400 | £4.95 |
| Europe incl. Eire/£7 for Overseas |

Add £2 for Europe incl. Eire/£7 for Overseas

| **Ten of the Best Games** (see page 66) |
|---|---|
| Disc 11.95 | £4.95 |
| Disc 19.95 | £7.95 |
| Disc 29.95 | £9.95 |

Add £1 Europe incl. Eire/Overseas

| **Ten of the Best Utilities** (see page 66) |
|---|---|
| Disc 11.95 | £4.95 |
| Disc 19.95 | £7.95 |
| Disc 29.95 | £9.95 |

Add £1 Europe incl. Eire/Overseas

| **Guild of Thieves** |
|---|---|
| Atari 800/130 Disc 19.95 | £4.95 |
| 8000 Disc 29.95 | £9.95 |

Add £1 Europe incl. Eire/Overseas

| **The Pawn** (see page 52) |
|---|---|
| Atari 800/130 Disc 19.95 | £4.95 |
| 8000 Disc 29.95 | £9.95 |

Add £1 Europe incl. Eire/Overseas

Readers in Europe incl. Eire add £2. Overseas add £4 per item unless otherwise indicated

---

**Payment:** please indicate method (Nr)

| Access/Mastercard/Eurocard/Guardian/Visa |
|---|---|
| No. | |
| Cheque/Eurocheque made payable to Database Publications Ltd. |

**Name:**

**Address:**

**Post Code:**

**Tel.:**

**ENQUIRIES ONLY: 061-480 0171 9am-5pm**

---

**Send to:** Database Publications, FREEPOST, Europe House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY. (No stamp needed if posted in UK)

**Telephone Orders:** 061-429 7931

**Delivery by Post:** Key '89, then 514550 5833

**Micro/LINK/Telecom Gold** 72-MAG001

Don't forget to give your name, address and credit card number

---

**November 1987, Atari User, 51**
Lose yourself in the magical world of Kerovnia!

This fascinating adventure features the most sophisticated parser around: You can type complex sentences and interact with the many characters, including some very intelligent animals.

This superb package includes a 44-page novel and a cryptic help section.

"The program took three man years of programming time to produce – and it shows. The Pawn is the stuff from which cults are made."

– Anthony Ginn, writing about the Atari ST version in the May 1986 issue of the Atari User

<table>
<thead>
<tr>
<th>Suitable for</th>
<th>RRP</th>
<th>Special reader offer</th>
<th>YOU SAVE</th>
<th>Offer including subscription</th>
<th>YOU SAVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atari 800/130 with minimum 64K plus 1050 double density disc drive</td>
<td>£19.95</td>
<td>£14.95</td>
<td>£5</td>
<td>£21.95</td>
<td>£10</td>
</tr>
</tbody>
</table>

TO ORDER PLEASE USE THE FORM ON PAGE 51
RICHARD VANNER concludes his series on amazing effects with a routine to plot your own software sprites

This month's Special FX gives you a routine that allows you to plot software sprites of any shape on to any graphics screen. The program itself is very complex so don't need to know how it works - just type it in and get objects moving round your screen.

Software sprites differ from hardware sprites in many ways. For example, they will interfere with the display but a hardware sprite won't. Hardware sprites also have independent colour registers whereas software sprites are limited to the playfield colours.

These points may lead you to wonder why we use hardware sprites at all? Well the disadvantage of the hardware sprites is that there are only four available and each one can only be eight bits wide. In the case of a software sprite you can define any size and have as many as you wish.

Type in Listing I to see the software sprites in action. Listing II is the Assembler listing and this will be of interest to any machine code writer as it uses some well known techniques. Also note that the routine uses part of page six for variable storage, so watch out for memory conflicts.

Before you can adapt the routine to plot your own software sprites, you need to know how they work and how they will affect the screen display. The call from Basic is a USR command that sends the eight parameters shown in Table I to the machine code routine. It takes the following format:

```
x=USR(address, sprite, bytes, type, width, height, x, y)
```

These parameters may seem a little complex but each one is essential, so let's look at them in detail.

The first one is the start address of the routine. Listing I copies the code into the string CODES and because the routine is relocatable the string can be anywhere in memory and the code will still run without any conflict. If you do copy the code into a string you can find the first parameter by using the command ADR(CODE$).

The second parameter is the address of the sprite. This again could be stored in a string or elsewhere, but you must now where it is.

Next is the number of bytes used in the current graphics mode. Table II gives you a cross reference if you are unsure of this.

The fourth parameter is the type flag. If set to 0 then the sprite will be plotted using the machine code OR instruction, otherwise a non-zero value will result in an EOR instruction being used.

The OR merges the sprite into the background whereas the EOR has other properties which allow the sprite to be printed over a background, and then erased without affecting the background.

The width parameter comes next and this must be the number of bytes across that the sprite takes up. Height is the number of lines down the sprite.

The final two parameters are the X and Y values of the pixel positions where the sprite will be plotted.

Tis is the end of the FX series. Now it's time to put the routines we've covered together and produce your own amazing FX.

---

**Table I: The parameters passed to the routine**

<table>
<thead>
<tr>
<th>ADDRESS SPIRE</th>
<th>Address of the sprite plotting routine.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BYTES</td>
<td>Address of the sprite to be plotted.</td>
</tr>
<tr>
<td>TYPE</td>
<td>Number of bytes across the screen.</td>
</tr>
<tr>
<td>WIDTH</td>
<td>Type of plot output.</td>
</tr>
<tr>
<td>HEIGHT</td>
<td>Width of the sprite.</td>
</tr>
<tr>
<td>X</td>
<td>Height of the sprite.</td>
</tr>
<tr>
<td>Y</td>
<td>X position to plot the sprite.</td>
</tr>
<tr>
<td>X</td>
<td>Y position.</td>
</tr>
</tbody>
</table>

---

**Table II: Bytes used in graphics modes**

<table>
<thead>
<tr>
<th>Graphics mode</th>
<th>Number of bytes per line</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>11</td>
<td>40</td>
</tr>
<tr>
<td>12</td>
<td>40</td>
</tr>
</tbody>
</table>

---

Listing I: Basic program for FX #6

```
1 REM ***************
2 REM * SPECIAL FX #6 *
3 REM * SOFTWARE SPRITES *
4 REM * BY *
5 REM * Richard Vanner *
6 REM ***************
10 DIM ASC(10), CODE$(60), YPOS(10), XPOS(10), XDIR$(10), YDIR$(10), ODBX(10), ODLY(10)
12 NUMSP=2
15 GRAPHICS 7:16
20 FOR A=1 TO 500
25 READ B:IF B=1 THEN POP ;GOTO 50
30 (CODE$(A,3)=CHR$(B)
40 NEXT A
50 FOR A=1 TO 10
```

("Turn to Page 55")
ATTENTION ALL 1050 DISK DRIVE OWNERS!!

Announcing the all new ULTIMATE drive enhancement
This Drive enhancement consists of a plug-in PCB, which can easily be fitted with our simple to follow instructions.
The 1050 IS PLATE Disk Drive enhancement offers many features never before available in one UNIT:

* Now with full Happy Compatibility.
* Improved Drive speeds - up to TWICE normal loading speeds (Depending on disk format used).
* Reduction of Drive WEAR and TEAR; now whole tracks can be stored in the internal 16k RAM.
* The IS PLATE can READ/WRITE a whole track in the timelapse takes a standard 1050 drive to READ/WRITE a single sector (up to five times standard speed).
* Supports double, Dual and Single Densities.
* Sector SKW is now no longer required to obtain Hi-speed as with US Doubler.
* Fast write with verify. This system is faster than other systems which write without verify.

A double sided operating system disk is supplied which offers the following:
Track tracer, Diagnostic tester. 48k and 128k Disk Backup utilities.

* The PLATE can be made invisible to software detection by either Slow down or 1050 emulation.
* Supplied with detailed information regarding software drive control to allow you to access the full potential of the PLATE.
* Will run all available disk operating systems (Dos) including: Spartadisc, Happy, warps speed Dos and other Hi-speed systems.
* With this system, up to sixteen drives can be connected and used.

A comprehensive 30 page bound manual is supplied. This includes fitting instructions.
All registered owners will be supplied with any software updates etc for the price of Disk and return postage.

Also supplied with GREMLIN GRABBER III
The comprehensive hi-speed back-up utility disk, complete with manual
(Existing owners please contact manufacturers for update)

This complete package
NOW ONLY
£89.95
inc. Post/Packing and twelve months guarantee
(A SAVING OF £24.95 ON PREVIOUS ADVERTISED PRICE)

53 Rugby Road, West Worthing, Sussex BN11 5NB
Tel: (0903) 40509 (24hrs)
(0903) 503711 (Bulletin Board 300/300 24hrs)

ATTARI DISCOUNTS

ATARI 4050/800 Cassettes
The Cereal Game .......................... Finshed £3.95
Atari Smash Hits Vol. 7 .................. English Software £3.95
Silentniche ................................. Atari £3.95
Surfers Eye, C.R.L .......................... £3.95
Electric Glide ............................... English Software £3.95
Track Blaster ............................... Demo £4.95
Atari ............................................ £3.95
Mr. Robot ...................................... Atari £3.95
Knockout ...................................... £3.95
Nightmares & Arabian Nights ............ £3.95
Colesco Towers & Cranes Tunnels ...... £3.95
Atari Smash Hits Vol. 2 .................. English Software £3.95
Kingdom ..................................... Atari £4.95
Blackbird .................................... £3.95
Hangman .................................... Atari £4.95
The Lone Rider .............................. £3.95
Shooting Arcade ............................ Demo £4.95
Tail of the Blue Lynx ....................... £3.95
Monstro's Revenge .......................... £3.95
Football Manager .......................... Addictive £3.95
Bowelins Construction Kit ................. £6.95
ATARI 52005040/5020CARRIAGES
Rally Speedway ............................ Adventure International £7.95
Alien Attack ............................... Atari £7.95
Super Breakout ............................. Atari £5.95
Mountain King ................................ £5.95
Mine Shaft ................................. Big Five Software £5.95
ATARI 400/805 DISCS & CASETTE
Podracer ..................................... Gasly £5.95
Sea Shell ...................................... Gasly £5.95
Zazooz ........................................... £5.95
ATARI 400/800 DISCS
Maxwell Demon & Memory Mania ....... Gasly £5.95
Nablop ........................................... £5.95
Child's Stations ............................. Atari £5.95
Junkie First ................................. £5.95
Pongy .......................................... £5.95
Rescue on Fracturas ....................... Activation £4.95

ATARI ST SOFTWARE
Territorial Encounters ........................ Solar Software £7.95

ATARI 2600 CARRIAGES
Grand Prix ................................... £8.95
Chopper Command ........................ £8.95
Endure ....................................... £8.95
Kangaroo Capers .......................... £8.95
Ghostbusters ............................... £8.95
Bowling ...................................... £8.95
Boxing ........................................ £8.95
Freeway ...................................... £8.95
Junior Pac Man ............................. £9.95
Galaxian ..................................... £8.95
Solitaire ..................................... £9.95
Star Racer (with touch pad) ............... £5.95
Defender ..................................... £9.95
Yars Revenge ................................ £9.95
Robotron ..................................... £9.95
Pitfall II ..................................... £9.95
Space Shuttle .............................. £9.95
Worms ......................................... £5.95
Breakout ..................................... £5.95
Bung I .......................................... £8.95
Superbreakout .............................. £8.95
Space Invaders ............................. £8.95
Racquetball .................................. £7.95
Skull Shot .................................... £7.95
Space Cadet ............................... £8.95
Battle Zone .................................. £8.95
M.U.L.E. ....................................... £8.95
Circus Atari .................................. £8.95
Crystal Castles ............................. £8.95
Bar Quest ..................................... £8.95
Real Sports Tennis ......................... £8.95
Medal Fantasy ............................. £8.95
David's Midnight Magic .................... £9.95

Access and Visa welcome
P&P £1.3 Titles £7.50 on or more £1.00 Overseas £2.00 for each title
Cheques payable to
Logic Sales Ltd.
1 Leander Square. Eastern Industrial
Petworthen Industrial Centre. Petworth. S.T.
24 hr Order Service on
0733 - 313870
After 7 to 10 days delivery

LIGHTEST SPEED SOFTWARE
60 High Street, Hamham, Bristol BS15 3DR
Tel: (0272) 604130
24 HOUR ANSWER PHONE FOR ALL QUERIES

ATARI 4050 CARRIAGE
Title ............................... Retail Price/Our Price
The Cereal Game, Fished ............. £3.95
A Day of the Beaks ................. £3.95
Arcade Hero .................. £3.95
Atari Drag .......................... £3.95
Atari Cargo .......................... £3.95
Boulderbash ......... £3.95
Boulders ................................ £3.95
Colours Chess 4 0 .................. £3.95
Colours Chess 5 2 .................. £3.95
Domain of the Undead .............. £3.95
Druid .................. £3.95
Echoes of Yore .................. £3.95
Freddy Fostory ................. £3.95
Gobbling ............................... £3.95
Gloop ....................................... £3.95
Green Gables ....................... £3.95
Horticulture ....................... £3.95
Journey to the Centre .............. £3.95
Journey to the Centre .............. £3.95
Knicknack ....................... £3.95
Lasar Hour ....................... £3.95
Leet .............................. £3.95
Merry-Go-Round ................... £3.95
Merry-Go-Round ................... £3.95
Plotham Perfection .......... £3.95
Rat's House Marathon ............ £3.95
Rescue on Fracturas .............. £3.95
Robotron .......................... £3.95
Space Invaders ................. £3.95
Space Invaders ................. £3.95
Star Racer (with touch pad) ........ £3.95
Terrestrial Encounters .......... £3.95

ATARI 5200 CARRIAGE
Title ............................... Retail Price/Our Price
Shark Duds Snickers ....... £6.95
Sun Sven ....................... £6.95
Tinies ....................... £6.95
Techno Drums ................... £6.95
Theatre Europa ................. £6.95
Tomahawk Drum ................. £6.95
Two to Tango .................. £6.95
Tutti Frutti ........................... £6.95
Up n Down ....................... £6.95
Wizards ............................... £6.95
Wizmas ............................... £6.95
Circus Atari ................. £6.95
Crystal Castles .................. £6.95
Bar Quest ........................... £6.95
Real Sports Tennis ............... £6.95
Medal Fantasy .................. £6.95
David's Midnight Magic ....... £9.95

ATARI ST DISC
Title ............................... Retail Price/Our Price
Asio Draft ....................... £9.95
Buffalo Commander ........... £9.95
Boulders ................................ £9.95
Colours Chess 4 0 ............... £9.95
Colours Chess 5 2 ............... £9.95
Circus Atari .................. £9.95
Commodore ........................ £9.95
Commodore ........................ £9.95
Crusade in Europe .............. £9.95
Domain of the Undead ........... £9.95
Footlocker of Year ............... £9.95
Greatwild ....................... £9.95
Jewels of Dolmir ............... £9.95
Journey to the Centre ........... £9.95
Knickerbocker ................... £9.95
Lasar Hour ....................... £9.95
Lonekicker ....................... £9.95
Mercenary ....................... £9.95
Mercenary ....................... £9.95
Plotham Perfection .......... £9.95
Rat's House Marathon ........ £9.95
Rescue on Fracturas ........ £9.95
Roborbon ....................... £9.95
Scrambling Wings ............... £9.95
Scrambling Wings ............... £9.95
Sprint ........................... £9.95
Spring ........................... £9.95
Spring ........................... £9.95
Spring ................................ £9.95
Summer ................................ £9.95
Uranio IV .......................... £9.95

Also available a large range of ATARI ST Titles. ALL PRICES ARE CORRECT AT TIME OF PRINT. IF TITLES ARE OUT OF STOCK THEY WILL BE SENT AT TIME OF RELEASE. ALL PRICES ARE INCLUSIVE OF VAT AND DELIVERY INSIDE THE UK, PLEASE MAKE CHEQUES P.O.'S PAYABLE TO LIGHTSPEED SOFTWARE. ALL ORDERS DESPATCHED WITHIN 24 HOURS, BUT PLEASE ALLOW 7 DAYS.
This is one of hundreds of programs now available FREE for downloading on MicroLink.
UNTIL the advent of Mini Office II and its integrated package of software, I did all my word processing using AtariWriter. For very many obvious reasons — mail merge, 80 column preview, ease of use and so on — I wanted to use my old AtariWriter files with Mini Office II.

The Mini Office II word processor can read documents created from AtariWriter, but unfortunately the format of the embedded commands is different. Faced with doing innumerable search and replace operations, I wrote this conversion program.

This utility will convert AtariWriter embedded commands to ones suitable for use with the Mini Office II word processor. Some of the commands are simple code changes, though others such as underlining require more complex handling. Table I shows how the commands map on to each other and the program line that handles the conversion.

Let's take a look at the conversion process. Before anything can be done a character must be brought from the source file. The program first tests to see if it is a text character and if it is it is put straight into the output file.

If it is not, it is tested for being a reverse video character. In AtariWriter this means that the character is to be underlined. Mini Office II handles this using the more flexible printer macros so the program will place the code for printer macro 3 at the start of an underlined section and printer macro 4 at the end. You will need to enter the codes to turn underlining on and off against the appropriate macro strings.

A similar technique is used for wide print and sub/superscript conversion.

If the character read in has a value between 1 and 28 it represents one of the AtariWriter embedded commands. Line 200 converts the character code into a line number which references the appropriate routine. Again Table I can be used to see how each character code maps on to the Mini Office II embedded command.

Some of the commands, such as left, top or bottom margin have direct equivalents which just require the appropriate embedded command to be output.

Some of them have a number setting their value following them, so the routine at line 5000 reads it (if any) and stores the value in the variable 'NUM'. For Mini Office II the number following the embedded command must be in reverse video.

Each embedded command that has a number after it stored in AS to be converted to reverse video by the routine starting at line 5100 before being output. The header and footer commands also use this routine to convert the header/footer text into reverse video.

The embedded commands in AtariWriter which refer to vertical spacing are in half lines. Since Mini Office II deals with full lines, all the vertical parameters must be divided by two before being output.

The right margin may also require some further processing since the Mini Office II equivalent is line length. This is handled by subtracting the left margin from the right. The value of the right margin is held in the variable RM and is set to a default value on line 20 of the routine.

Paragraphs are converted into the appropriate number of hard returns and spaces. For this to be possible the paragraph settings in AtariWriter must be stored until the paragraph character is encountered.

INDT holds the numbers of spaces to indent a paragraph by and defaults to 5. The variable PS holds the paragraph spacing. When the paragraph code is used the program outputs PS blank lines and INDT spaces before the next character.

Finally, if there are any special printer codes used these are always replaced by the printer macro P7. If the special code is different in each case you will have to go through and edit each one (or assign a different macro) as it occurs.

Once the program has converted the entire file, the output file can be read straight into Mini Office II. In this way all the powerful features of Mini Office II can be used on your old AtariWriter files.

<table>
<thead>
<tr>
<th>Line No.</th>
<th>AW code</th>
<th>Command description</th>
<th>Mini Office II equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>1</td>
<td>Wide print On/Off</td>
<td>(P1)/(P2)*</td>
</tr>
<tr>
<td>1200</td>
<td>2</td>
<td>Bottom Margin</td>
<td>BM</td>
</tr>
<tr>
<td>1300</td>
<td>3</td>
<td>Centre/Block right</td>
<td>codes 253/255 stored</td>
</tr>
<tr>
<td>1400</td>
<td>4</td>
<td>Paragraph Spacing</td>
<td>code 140</td>
</tr>
<tr>
<td>1500</td>
<td>5</td>
<td>New Page</td>
<td>DF</td>
</tr>
<tr>
<td>1600</td>
<td>6</td>
<td>Define Footing</td>
<td></td>
</tr>
<tr>
<td>1700</td>
<td>7</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td>8</td>
<td>Define Heading</td>
<td>DH stored</td>
</tr>
<tr>
<td>1900</td>
<td>9</td>
<td>Paragraph Indent</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>10</td>
<td>Justification</td>
<td>LJ/FJ</td>
</tr>
<tr>
<td>2100</td>
<td>11</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>2200</td>
<td>12</td>
<td>Left Margin</td>
<td>LM</td>
</tr>
<tr>
<td>2300</td>
<td>13</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>2400</td>
<td>14</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>15</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>2600</td>
<td>16</td>
<td>Paragraph</td>
<td>see text</td>
</tr>
<tr>
<td>2700</td>
<td>17</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>2800</td>
<td>18</td>
<td>Right Margin</td>
<td>LL</td>
</tr>
<tr>
<td>2900</td>
<td>19</td>
<td>Line Spacing</td>
<td>LS</td>
</tr>
<tr>
<td>3000</td>
<td>20</td>
<td>Top Margin</td>
<td>TM</td>
</tr>
<tr>
<td>3100</td>
<td>21</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>3200</td>
<td>22</td>
<td>Join Files</td>
<td>GF</td>
</tr>
<tr>
<td>3300</td>
<td>23</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>3400</td>
<td>24</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>3500</td>
<td>25</td>
<td>Page Length</td>
<td>PL</td>
</tr>
<tr>
<td>3600</td>
<td>26</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>3700</td>
<td>27</td>
<td>not used</td>
<td></td>
</tr>
<tr>
<td>3800</td>
<td>28</td>
<td>Superscript</td>
<td>(P5)*</td>
</tr>
<tr>
<td>3900</td>
<td>29</td>
<td>Subscript</td>
<td>(P6)*</td>
</tr>
</tbody>
</table>

Table I: Codes used in AtariWriter and Mini Office II
"Darg" "World Cup Manager" and 
and Joe the Nuclear Cavens"

3 Disks only £10 inc P&P (save over £18)
3 Cassettes only £6 inc P&P (save over £11)
Single game £5 disk, £3 cassette

Cheque or PO to
STV Software
9, Chiswick Walk
Birmingham B37 6TA

TURN YOUR 1029 PRINTER INTO 4 PRINTERS IN ONE with FONT IV

Replacement character ROM!

YES 4 character ONLY £24.99 POST FREE
sets at the flick of a switch — 3 new sets — all with true descenders.

☑ Simply replace the old character ROM in your 1029 with FONT IV.
No soldering or cutting necessary.
☑ Fitted in minutes.
☑ 100% compatible with all existing software.
☑ Adds new dimensions to your letters & documents. Contains existing Atari character set plus 3 new sets:

<table>
<thead>
<tr>
<th>NLQ</th>
<th>FUTURE</th>
<th>DESCENDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCDEF</td>
<td>ABCDEFG</td>
<td>ABCDEFG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or just descender ROM for only £12.99 POST FREE</td>
</tr>
</tbody>
</table>

☑ If you prefer we can supply just the descender character on a chip at a lower price.
☑ Simple to fit — no soldering etc.
☑ 100% compatible with existing software.

SUNARO

SUNARO SOFTWARE (AU)
PO BOX 76, MACCLESFIELD, CHESHIRE SK10 3PF

STOR SOFT
MAIL ORDER SPECIALISTS
INCREDIBLE LOW PRICES!
ALL DISKS CARRY A NO CUBILE REPLACEMENT GUARANTEE ARE CERTIFIED 100% ERROR FREE & COME WITH LABELS. 5½" ALSO HAVE SLEEVES & WRITE PROTECTS. SLIP SIDED DISKS HAVE 2 INDEX HOLES AND 2 NOTCHES.

SPECIAL OFFER
25 SS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 16.00
50 SS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 25.00
100 SS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 39.95
25 DS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 17.00
50 DS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 26.50
100 DS 481TP 5 25 DISKS & 100 CAP LOCKING DISK BOX 42.00

5½" DISKS FROM AS LITTLE AS 33 PENCE
BLANK 5½" DISKS — DISK NOTICHER FREE WITH EACH 100 DISKS PURCHASED

UNBRANDED
TRIAL 10 25 50 100 1 in a plastic library case

SS 481TP 4.50 9.00 17.00 33.00 6.50
DS 481TP 5.50 11.00 19.00 35.00 6.50
DS 681TP 5.50 13.00 21.00 37.00 7.50
DS 681TP FLIP SIDED 7.00 14.00 22.00 38.00 8.00
MIMIC FLIP SIDED DS 681TP 8.95 20.00 38.00 70.00 9.90
MIMIC HIGH DENSITY 15 600 23.00 42.00 70.00 24.00
COLOURED — mix & match or all one colour
SS 481TP 5.50 12.00 22.00 42.00 7.50
DS 481TP 7.50 14.00 24.00 44.00 8.50
DS 681TP 9.00 18.00 28.00 50.00 9.00

SPECIAL PRICE! DYSAN DS 481TP BOX OF 10 ONLY

LOCKING DISK BOXES

5½" HOLDS 50 7.95 5½" HOLDS 100 9.95
5½" HOLDS 40 7.95 5½" HOLDS 30 OFF 90 3½" 9.95
Just ask for more information. Cheques etc payable to STOR SOFT. (International orders add 10% and remit in pounds Sterling by bank draft or int. money order. Write for quote in your currency)

ACCESSMASTERCARD/DEBITCARD/VISA accepted

CREDIT CARD ORDER LINE — 0272 89050 24 HOURS A DAY, 7 DAYS A WEEK
V.A.T. & P&P INC. NO HIDDEN EXTRA — WHAT YOU SEE IS WHAT YOU PAY

18 Crown Close, Sheering, Bishop’s Stortford, Herts CM22 7NX

58 Atari User November 1987
PROGRAM BREAKDOWN

1-40 Initialise variables and arrays
45-60 Opens input file
70-80 Opens output file
100-210 Main decode loop
1100-4100 Conversion routines (see table 1)
4500-4530 Routine for underlined text
5000-5060 Routine to read in embedded command parameter.
5100-5130 Routine to make text in AS reverse video.
9000-9010 File closing at end of conversion.

VARIABLES

A$ Array for text strings.
WIDE Wide print on/off flag.
LM Holds current value of left margin.
RM Holds current value of right margin.
BM Holds current value of bottom margin.
PS Holds current paragraph indent value.
PL Holds current paragraph spacing.
LS Holds current line length.
NUM Holds current line spacing.
X Returns current embedded parameter.
FUNC Holds current character code.
CNT Counts the number of lines processed.
SETTING Pointers to subroutine.
UNDERLINED Pointers to subroutine.
REVID Pointers to subroutine.
NOUSED Pointers to subroutine.

Turn to Page 60
4496 REM Underline ON=493 Underline OFF=494
4500 PUT #2,19:PUT #2,X-128
4510 GET #1,X
4520 IF X>127 THEN PUT #2,X-128:GOTO 4
510
4530 PUT #2,28:GOTO 110
4995 REM ROUTINE TO READ IN EMBEDDED COM
4996 REM SETTING VALUES.
5000 NUM=0
5100 NOTE #1,P1,P2:GET #1,X
5200 IF X=32 THEN RETURN
5300 IF X=16 OR X=37 THEN PRINT #1,P1,P2:RETURN
5840 X=X+68
5850 NUM=NUM+10+X
5860 GOTO 5800
5895 REM ROUTINE TO CONVERT AS TO REVE
5895 REM END OF CONVERSION
9000 CLOSE #1:CLOSE #2
9100 ? "ALL DONE"
9999 END

Attention Atari Adventurers!

Wargames Adventure Simulation Specialists!
Run by Enthusiasts, for Enthusiasts!

We Stock: (DISC)
Atari/ST - Apple II
Commodore/Amiga
IBM/Amstrad

Mail order anywhere or visit our retail store
Send £1 for catalogue (refunded with 1st order)

Call in for a coffee and a chat!

Computer Adventure World
1A Charing Cross, Birkenhead, L41 6EJ, England
Telephone: 051-666 1132 (Mon/Sat, 10am-8pm)
**HINTS & TIPS**

**Action Biker**

HERE are the locations of eight of the items that you have to find:
- By the big lake, by the river near the petrol station, by the fairground, in the building site, in the field near the petrol station, beside the drag race track, on the other side of the drag racing track, by the small lake in the field near the petrol station. – Michael Simons, Crowborough, East Sussex.

**F.15 Eagle**

IF you are running out of fuel simply keep your finger on the afterburner key and see what happens. – Dinesh Bhudia, Harlesden, London.

**Crystal Raiders**

PRESSING Start while holding the joystick button makes your craft invincible. You can then fly through all the alien craft and nothing will happen to you! – Colin Raynor, Crediton, Devon.

**Mediator**

IN the June 1987 issue of Atari User there were some tips for Mediator. Here’s some more:
- Screen 1: Position the spaceship in the centre of the screen and go downwards. When you get to the force field blast a large hole in it. Keep in the centre and go down this hole slowly and land softly on the pad.
- Screen 2: Fire at the tree to make it fall and form a bridge. A bone should appear on the other side of the screen – go and collect it. Walk back over the bridge then on the patch of brown earth. You should hear a little noise that means that the bone is stored away.
- Collect the other bones that appear and after six bones a horse will appear. You have to guide it over the bridge to the right hand edge of the screen. It will follow your exact steps, so be very careful when guiding it over the bridge. – Susan Bowling, Macclesfield, Cheshire.

**Boulderdash**

IF those irritating cubes are boring you then simply dig an anti-clockwise square, but always leave a block of earth in the middle as this will confuse them and cause them to stay there.
- The crystal butterflies explode into nine diamonds when killed but if you kill one when it is adjacent to a wall it will only form six diamonds. Be careful just where you kill them, as finishing some levels requires an exact number of diamonds.
- If some levels seem impossible, especially in the later stages of the game, try digging some earth from under a wall and drop a boulder through – you will be surprised by the result. – Ruth James, Heaton Moor, Stockport.

**International Karate**

TO obtain the higher belts you need the following points:
- White belt: Already yours;
- Yellow belt: 6000;
- Green belt: 12000;
- Purple belt: 18000;
- Brown belt: 24000;
- Black belt: 40000.
- I found that on the lower belts (up to around Green belt) it is best to somersault in and follow it up with a flying kick. I also found that on the belts after Green it is best to stand your ground and let your opponent come towards you so you have the advantage of not having to wait for your previous move to finish. – R. Holding, Oldham, Lancs.

**The Living Daylights.**

LEVEL 1: When you jump the first rock keep jumping and you will get over all the remaining rocks.
- Level 2: Pick up the binoculars and use them to make the screen brighter.
- Level 3: Pick the hard hat and use it so that when a pipe hits you you only lose three strength points.
- Level 4: Shoot the milkman straight away and keep running to the end.
- Level 5: Shoot the balloons as fast as you can – before they are above you.
- Level 7: Shoot the man who appears and keep running while jumping the bombs that the helicopter is dropping. – A. Gates, Manchester.

**Ollies Follies**

WHEN the game has loaded press Start and place your man in a safe place – where he can’t be killed – and type Frank, Fandla or Zoom. These are passwords and will transport you to different levels of the game.
- When the music plays and your hair goes funny colours you can walk into the robots and destroy them. – R.E. Wilkinson, Deal, Kent.
STACK COMPUTER PRODUCTS

CENTRONICS PRINTER INTERFACE 400, 800, XL, XE (Any 8 Bit Atari)

TYPE 72000

- ANY CENTRONICS PRINTER
- NO SOFTWARE NEEDED
- ALL CABLES SUPPLIED
- EASY TO USE — JUST PLUG IN AND GO
- TRANSPARENT & CONVERSION FEATURES INCLUDED
- FULL YEARS WARRANTY

FREE 40 PAGE CATALOGUE ON REQUEST OR WITH ORDER

MEEDMORE LIMITED
24 Forriers Way, Netherton
Merseyside L30 4XL
Tel: 051-521 2202

CUT PRICE SOFTWARE

| AT&T SOFTWARE | LARGE | SMALL | OUT | ATARI DOD:TOP 20 TITLES | CASES | DISC
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NorthWest</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>SouthWest</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>EastEast</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>WestWest</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>NorthEast</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>SouthEast</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>EastWest</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>WestEast</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>T.B.</td>
<td>18 XX</td>
<td>13 XX</td>
<td>13 XX</td>
<td>18 XX</td>
<td>13 XX</td>
<td>13 XX</td>
</tr>
<tr>
<td>World Games</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Star Trux</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Dexterity</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Space Invaders</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Subspace 5000</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Select Service</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Foosball</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Curriculum</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Magnetic</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Crossword</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
<tr>
<td>Microtexts</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
<td>24 XS</td>
<td>19 XS</td>
<td>19 XX</td>
</tr>
</tbody>
</table>

(Change: 50% on all books)

ATARI 400/600/800/XL/XE UTILITIES AND GAMES

HAWKEN DCS 3—More than a tape is disc converter—it's the best menu driven software management system yet. Holds up to 40 programs per disc displayed on a colourful menu. Run any program you want at the press of a button. A functions including multi-surge tape to disc, disc to tape, disc to disc. Edit function to convert all your old menu systems (multi boot etc.) to a Hawken DCS works in any density (all word speeds in DC). No other program rivalled £7.65.

DISC DUPE 5—Excellent sector copier for ordinary or bad sectored protective discs. Remember bad sectors and recalculates them. Includes rpm test and formatter. £9.85.

KOPY KAPT—Transfer your favourite cartridge software to disc or tape. Comes complete with cartridge emulator. £20.95.

If you like the look of single/multi tape/layer easily. £7.95.

AUTOMEN—Automatically lists a file on disc (basic or basic) and will run them at the press of a button. Works with any density—any ATARI £7.95.

DOS MCD—Multi Atari LOGO to work with your double density when used with US 1200 with double mod 1s plate or Flappy. Gives 120% capacity on each side of the disc £28.95.

ELECTRONIC DISC RATCHET—Use other side of disc without scratching. £14.95.

GAMES—A large selection of used ORIGINAL software on tape, disc and cartridge at half new price or less. 5 free games with all orders over £20.

For our range of tape/disc/cartridge utilities and games send large SAE to HOWFENSOFT 145 BANKSIDE, WESTHOUGHTON, BOLTON, LANCs. Overseas add £2 to all orders.

ATARI 400/600/800/XL/XE UTILITIES

THE ALIGNMENT—Fascinating single or multi-utility conversion game up to speed including diverse common side on cassette. Totally automatic and needs no technical knowledge to use.

ONLY £1.65 Post Free

DISC TO DISK—Duplication disks quality and efficiently, including those protected by read-protect feature. Features a fast formatter, disk mapper, load sector check, and a versatile sector copier.

ONLY £6.65 Post Free

DISC TO DISCO—A simple duplication backup system — will duplicate disks at a fraction of the price of a disk duplicator and will backup tapes.

ONLY £6.65 Post Free

TURBOCHARGER 32/XE—speed up cassette loading times with Turbocharger! The utility will duplicate cassette tapes at a faster rate, and works with both machine-code and disk cassette programs.

ONLY £3.65 Post Free

BINARY TAPE EDITOR—so well as duplicating tape tapes! Have also been on Cassettes and work with any density, in four directions in both directions! Game can be set up and load tested with your own cassette. cassette cassette.
NEW LOWER PRICES AND... EVEN BETTER SERVICE!
Now ALL Goods Despatched SAME DAY by 1ST CLASS POST - FREE!

PRINTER DEALS SAVE ££££'s
Phone now for details of our Easy Payment Scheme on all these printers.

- **ATARI SM 804**
  - 80 Column - Dot Matrix
  - 80 CPS
  - Friction & Tractor Feed
  - 12 Month Warranty
  - **ONLY £189.00**
  - **SAVE £10**
  - FREE - Atari Printer PLUS Word Processor Disk with All Printers
  - FREE POSTAGE - All Printers
  - EASY PAYMENT SCHEME - Now Available

- **PANASONIC KX-P1081**
  - 80 Column - Dot Matrix
  - 165 CPS - Draft Mode
  - 35 CPS - NLO Mode
  - Friction & Tractor Feed
  - 12 Month Warranty
  - **ONLY £209.00**
  - **SAVE OVER £70**
  - ALL of these Excellent Printers need the "Graphics AT" interface to connect to your Atari 8-Bit Computer. SAVE £20 - Buy the "Graphics AT" with your Printer for ONLY £289.00 (Normally £309.00)

- **MP 165**
  - 80 Column - Dot Matrix
  - 165 CPS - Draft Mode
  - 35 CPS - NLO Mode
  - Friction & Tractor Feed
  - Full 2 year Warranty
  - **ONLY £229.00**
  - **SAVE OVER £80**

DISKS & STORAGE

- **TOP QUALITY 5¼" BULK PACKED DISKS**
  - Fully Guaranteed
  - Individual Certificate 100% Free Refund
  - Supplied in strong white card boxes per 10
  - Complete with envelopes, User Manuals, white print labels etc
  - ALL POST FREE!

- **DD100L DISK STORAGE BOX**
  - Smeared Poropex High Impact Plastic
  - Holds up to 100 Disks
  - Hinged Lockable Lid (2 Keys)
  - Rubber Feet - Dividers
  - **ONLY £10.95**

BOOKS

- **Only £14.95 Post Free!**

- **PAPER**
  - High Quality 11" x 9 ½"
  - 60gsm Weight
  - Micro-Perf all Round
  - 2000 Sheets -

- **BOOKS**
  - Get the most from your ATARI Computer with these EXCELLENT BOOKS at special low COMPUART PRICES (N.B. no VAT on books)
  - ATARI 130XE HANDBOOK
  - **£5.95**
  - BASIC - XL EDITION
  - **£12.95**
  - MAPPING THE ATARI
  - **£15.95**
  - YOUR ATARI COMPUTER
  - **£18.95**
  - COMPUTES 1st BOOK OF ATARI GAMES
  - **£10.95**
  - COMPUTES 1st BOOK OF ATARI GRAPHICS
  - **£10.95**

Also Available

- Full range of ATARI 800/1040 Computers, Printers, Monitors, Software, Accessories etc. Ask now for details of our EASY PAYMENT SCHEME on Atari ST's.

How to Order...

- Simply fill your order, name and full address with a cheque or postal order made payable to Compuart, and post to our address stated in ad.
- Phone our 7 days a week High quality 0800 hours order using your credit card. Please give your full name and address, daytime phone number. details of your order and the name of the magazine you are ordering from.
- All goods are usually dispatched same day - 2nd class post - FREE OF CHARGE!
- For SPEEDY GUARANTEED NEXT DAY DELIVERY by COURIER. Please add £7.50 to your order.
- All prices include VAT. Prices and delivery subject to availability. All orders fully guaranteed.

JOYSTICKS

- **THE 'MICROFASHER'**
  - **£9.95**
  - Dual Fire Buttons
  - 6-Way Arcade Quality
  - Micro Switches for Precision

- **THE 'MICROBLASTER'**
  - **£12.95**
  - Extra long 5ft Cable
  - Single and Rapid Fire Facility
  - Non slip Rubber Feet

- **THE 'JOYBALL'**
  - **£9.95**
  - All three of our Joysticks include the following features:

Compumart

A GREAT DEAL MORE-FOR A GOOD DEAL LESS!
COMPUART - Dept ATU - Unit 8 - Falcon Street
Loughborough - Leics - LE11 1EH
T: 0509 - 262259 / 233893 / 266322
THE ULTIMATE SHOOT THEM UP!

Delta Base to Star Quest - Priority Despatch - Code Red. Your mission is to fly Star Quest over the Alien Mothership, destroying as much of it as possible with the ultimate goal being the Main Ship's Reactor.

Your flight will be hazardous whilst avoiding tall pylons, buildings and shadowed objects. You will come under intense attack from waves of well-equipped Defender Ships protecting the Mothership.

R.R.P. Cassette £7.95
Disk £9.95

Tynesoft Computer Software,
Addison Industrial Estate,
Blaydon, Tyne & Wear
NE21 4TE
TEL: (091) 414 4611