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Vol. 2 No. 8 December 1986 £1

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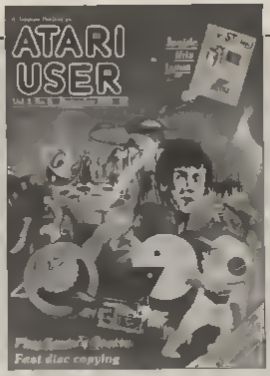
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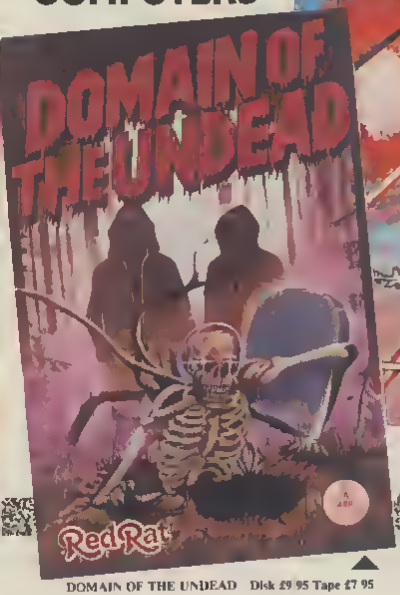
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Red Rat Software

11 FENNEL STREET MANCHESTER M4 3DU

Triple mode design

THE new Atari 7800 plays all Atari 2600 games without requiring an adapter and its open design allows it to accept a wide range of peripherals

The system memory has two 2k x 8 bit static ram chips and one 16k x 8 rom

Ram chips are selected using the signals RAMCS2bar and RAMCS1 bar segregated in the Maria graphic chip

The machine runs in three distinct modes – Internal and Maria modes and 2600 compatibility mode

The system automatically decides which mode to run in depending on the cartridge plugged into the slot when power is turned on

Audio in the 7800 system always comes from the custom TIA chip possibly mixed in with the EAUD signal from the cartridge

The video may come from either of two sources TIA or Maria. When running in compatibility mode the 7800 system turns off the Maria chip and all video outputs remain low

The keyboard connects via the joystick port. Vertical resolution in pixels is 320 by 192

The machine offers improved graphics and game play compared with the 2600 system and competitive performance versus the XE line" says Atari

It doesn't require an adapter to play 2600 cartridges and it will be launched with a full line of hit software titles

Show debut for games machine

AN exciting new Atari games machine will be unveiled at the Atari Christmas Show in London.

The Royal Horticultural Hall Westminster has been chosen as the venue for the UK launch of the Atari 7800 – less than a month after its debut in America

Atari describes the newcomer – which is expected to carry a price of £69 95 – as a reaffirmation of our commitment to the games market

The machine is intended to answer long standing criticism that the company has been neglecting its loyal army of games enthusiasts in favour of its upmarket operations – in particular the ST series

The new machine which is due in the shops before Christmas is expected to revitalise Atari 8 bit software production

A large number of new games will be available by the time the 7800 arrives in the shops an Atari spokeswoman promised

Software houses are clamouring for development kits and plenty of software will be coming in from US developers

The 7800 will be the centrepiece of Atari's major presence at the Christmas Show which runs from Friday November 28 to Sunday November 30

The company has promised that visitors will be able to enjoy hands-on experience of the new machine as well as getting a chance to see its superb graphics

Bargains

Atari has been accused of ignoring 8 bit users in favour of the 16 bit ST but they have not been forgotten new UK general manager Bob Gleadow told *Atari User*

"We have new software for them and this will be on display at the show

Altogether more than 100 stands will be loaded with new products and bargain buys from the leading Atari suppliers

The spacious 20 000 sq ft exhibition hall will play host to big names like Software Express Twillster CDS Microdeal and Advanced Systems & Techniques as well as Atari itself

Thus means the location is likely to see a repeat of the scenes at the first Atari Computer Show last March which attracted 15 000 visitors

Latest news of product launches at the show includes Procopy from The Moving Finger Company

This back up utility lets users make working copies of all their ST software as well as formatting and copying discs and costs £34 95

Eidersoft will be offering two co ordinated graphics and sound packages for the ST – Prosprite Designer price £39 95 and Prosound Designer at £49 95

The firm is also launching Minicom a new comms package offering access to both Prestel and Telecom Gold as well as supporting Xmodem and Kermit protocols Price £29 95

Eidersoft single and double floppy drives for the ST will be available for £125 and £199 A 20Mb hard disc unit incorporating fully Gem co-ordinated software and desktop accessories costs £599

NEW UK SALES CHIEF

ANOTHER former Commodore executive has joined the Atari UK management team

Paul Welch has been appointed UK sales manager a position similar to the one he held at Commodore before leaving a year ago to become a mail order software dealer

Welch follows former Commodore colleague Bob Gleadow to Atari Gleadow now Atar UK general manager was Commodore's UK general manager when Welch joined the company in 1981 as national accounts manager

The two men struck up a rapport at Commodore and it was Gleadow's recent move to Atari which tipped the scales away from two other attractive job offers Welch was considering

Interviewed by *Atari User* Welch revealed he had been offered the Atari sales boss position two years ago but had turned it down

Now that Bob Gleadow has joined Atari it's a different proposition" he said

We had a good working relationship at Commodore and I'm sure we can make things happen for Atar...

We intend to make Atari the prominent brand in the UK micro market once more concentrating on ensuring our machines are fully supported by top quality products

ALL program listings in *Atari User* are now available for free downloading on MicroLink, the UK's fastest growing electronic mail service. They join hundreds of programs already available in the telesoftware section, one of the most popular areas of MicroLink.

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BUMPER TO BUMPER

CLASSIC pinball with a difference gets the arcade video treatment in Pinball Factory from MichTron for the Atari ST.

In addition to the game of pinball players can also design build and edit their own screens.

They can create their ideal pinball machine choosing from a multitude of bumpers tabs and other devices and placing them wherever they like.

Then using a graphic drawing system walls and solid barriers can be added.

The playing board can be illustrated with pictures arrows and other designs which the ball will pass over during play.

Any of the ST's 16 palette colours can be changed as desired using the built-in art program and there is a choice of more than 500 different shades.

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ON-LINE TO NORTH POLE

MESSAGES to Father Christmas need not depend on the efficiency of the postal service this year.

To ensure that every child can contact him before the big day the jolly old fellow has gone on line up at the North Pole.

Equipped with an Atari micro no less Santa has hooked up his workshop to the giant MicroLink computer in the UK.

Now all the kiddies or their parents – have to do to contact him is to transmit their message via micro and modem.

SantaLink is the latest service being offered through the country's fastest growing electronic mail and messaging system.

All MicroLink subscribers have to do is type SANTA at the prompt when they sign on line and the rest will be taken care of. The system takes care of the rest. And Father Christmas promises that every message sent to him will get through and be answered personally straight back to Christmas Eve when he leaves the delivery of presents.

Package for pros

A MUSIC sampling system for the ST has been launched by Syndromic Music.

The ADAP (Analog to Digital, Audio Processor) SoundRack allows the user to store up to 64 multi-samples in memory for instant playback and incorporates real-time digital effects processing – delay, echo, reverb and envelope-following. The package, which is aimed at music, video and broadcast professionals, is already used by top artists Chicago and the Pointer Sisters.

Price £2,499



Data back-up

ATARI software producer MichTron has brought out a utility providing data back up protection for ST hard drive owners.

Backup duplicates the contents of the user's hard drive to floppy discs minimising the risk of loss.

It also lets the user restore the floppy back ups to the hard drive.

Backup uses Gem pull-down menus to offer numerous options with different types of mouse controlled back-ups and restores.

Intelligent routines give the choice of making full back-ups of the entire hard drive back-ups of newly created or modified files or back-ups simply by date.

The user can make an image back up transferring logical sectors to counterpart floppies. Price $39.95.

Easier payrolls

A PAYROLL package for the Atari ST has been released by Kyle Data.

Kyle-Wages is designed so that all PAYE National Insurance and statutory sick pay information need only be updated once irrespective of the number of payrolls on the system.

Separate weekly and monthly payrolls for a number of companies can be held on the same disc.

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Standard payments and deductions are held on file and pay details can be entered manually or automatically. Price £195.

24 HOUR TURN ROUND

A NEW concept in electronic publishing from Lightning Graphics allows Atari ST users anywhere in the country to buy Scantext digital typesetting for as little as £5 per A4 page.

It is intended for companies and individuals involved in graphic design printing and publishing who cannot afford the cost of high quality traditional typesetting.

Access

Lightning offers training and a manual along with £100 worth of free typesetting and access to its electronic mail system.

Text is keyed in conventionally on the micro and instead of marking up the copy the user inserts special codes supplied in the manual.

These codes signify typical marking up functions such as type size type face and line length.

Copy is sent via electronic mail directly on to Lightning's Scantext typesetting system.

Once processed – 24 hours is the normal turnaround – bromide printouts are sent back to the client by post or special courier.

All set to move up

ATARI believes it is poised to move into fourth spot in the UK micro sales chart.

Elated executives at the company's HQ are celebrating industry reports that Atari's 8 bit machine sales will soon displace the Commodore 16 in the rankings.

"Latest figures show we are only a fraction behind fourth place right now", a spokeswomen told *Atari User*.

'We're confident that the current trend will continue and we'll be challenging Amstrad for third place soon.

'The overall picture confirms the progress that Atari has made to regain its pre-eminent position in the UK micro marketplace.

' Naturally we're all delighted to hear that independent industry research portrays us in such a favourable light''.

Record release

A MANAGEMENT system for C programmers using the Atari ST has been released by Microdeal

Easy Record handles up to 16 indexed record files at one time with eight key fields in each record file and eight subfields in each key field

Each key field has a maximum of 123 bytes

The system allows record access through a variety of logical functions and has a fast multiway random record storage facility

Transaction processing allows related files to be kept consistent with start and end and undo transaction functions

Easy Record allows specification of key fields duplicate key field values creation of files from existing open files and creation of files from definition files and/or blocks

It also allows integer unsigned long float double string and case independent string key data types and C source code is included Price £39 95

Also new from Microdeal for the ST is Mighty Mail a comprehensive mailshotting database with GEM pull down menus priced £29 95

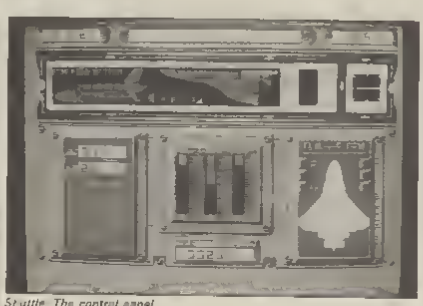
Movie music

SPECIALIST in computer software for the music industry German-based Steinberg Research has begun distribution operations from new premises in Oxfordshire

It has also announced its first product for the Atari ST an aid to synchronising music in film and television studios

Called the SMPTE – Society of Motion Picture and Television Engineers – generator it will be totally interactive with the revised Pro 24 program – a midi event recorder – and connect to the ST via the RS232 port

The company claims this combination will set new standards in sequencing from time code The SMPTE generator itself will be available separately for about £600



Shuttle The control panel

Christmas games roundup

A VERSION of the hit arcade game Gauntlet has been released for the ST by U S Gold

The game which generated a lot of excitement when released in its original coin in the slot format last year, offers multi player capabilities as well as sophisticated graphics

A choice of four characters is available with 150 levels of difficulty

The object is to combat waves of attacking monsters while competing for food, treasure and magic potions Price £24 99

Also new from U S Gold is the first in a series of Mastergames compilations

Shoot Em Up for the Atari 8 bit series features four previously released titles – Super Zaxxon Dropzone Blue Max 2001 and Fort Apocalypse Cassette price £9 99

★★★

THE first two in a series of Level 9 trilogies have been released for the ST and 8 bit machines by Rainbird Software

Extensively re-written Jewels of Darkness comprises three of the most popular Level 9 ST adventures – Colossal Adventure Adventure Quest and Dungeon Adventure

The second package Silicon Dreams features Snowball Return To Eden and Worm In Paradise all running on the 8 bit range as well as the ST

Both packages come complete with a 94-page novella incorporating a 12 page play guide

Jewels of Darkness is available on disc price £19 95 Silicon Dreams is available for the ST on disc price £19 95 and for the 8 bit series on disc or tape for £14 95

★★★

FOUR new ST games have been released by Microdeal

Electronic Pool is a colourful video pool game featuring a high score table realistic sound effects including rag time music Price £19 95

Pinball Factory allows the user to customise his own pinball games and save them to disc Incorporating graphics fast action and sound it costs £24 95

Shuttle is a graphic simulation of the NASA spacecraft Featuring music from the film 2001 A Space Odyssey the package costs £24 95

Karate Kid II is the game of the film

As Daniel LaRusso the player must battle against powerful adversaries finally meeting the evil Chozen in the castle of King Shohash where the secret of the drum must be discovered

The program features full size animated screens and costs £24 95

★★★

LATEST release from Domark for the Atari 8 bit series is a version of its bestselling package Trivial Pursuit Genius Edition

Offering all the facilities of the popular board game together with animated graphics the program is available on disc at £19 95 and cassette at £14 95

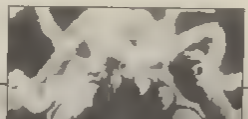
A Young Players Edition is also available for the XL and XE at the same prices

★★★

AN adventure question time for users of Level 9 software is to be held in Reading on Saturday December 13

Owners of 8 and 16 bit machines are invited to attend the forum where Level 9 representatives will be offering adventure hints and tips and giving away free gifts

The event will be held between 11am and 1pm at the Ordem Computer Store Harris Arcade off Friar Street in Reading



CARTOON favourites from the popular Master of the Universe television shows will feature on new software for the Atari ST. A licensing deal has been signed by Mattel and US Gold to bring out separate arcade and adventure versions of a game starring He-Man, Battle Cat and Teela in their fight against the evil Skeletor

An event NOT to be missed!

Atari Christmas Show

Royal Horticultural Hall
Westminster, London SW1

Friday November 28 10am-6pm
Saturday November 29 10am-6pm
Sunday November 30 10am-4pm



The first ever Atan Show last spring was an outstanding success From all over Bntain Atan enthusiasts flocked to London to find out all they could about their favourite machine

Soon the record breaking Atan Show will be back – with three days devoted to the exciting developments in this expanding market Make a note in your diary NOW to make sure you don't miss this great Christmas extravaganza!

- ★ All the latest software from publishers in both the UK and USA
- ★ New hardware releases from Atan and other major companies
- ★ Experts from Atan User and Atan ST User to answer your questions
- ★ Experience the fascinating world of computer communications
- ★ Everything on show from stocking fillers to complete Atan systems

Whether you're a new user or a seasoned addict, you'll find the show overflowing with ideas to help you expand your computing honzons!

They'll all be there! Games consoles, 8 bit machines . . the entire ST range!

This is YOUR chance to meet top people in the world of Atari. Among them will be experts from:

Atari UK
2 Bit Systems
Aaronfay Marketing
Advanced Systems & Tech
Anirten
Anco Software
Atan User/Atan ST User
Centec
Colleen
Computer Bookshops
Computer Concepts
Computer House
Demon Software
Direct Disk Supplies
Elecinc Studio
Eidersoft
First Software
GEM Distribution
Guitronics
HSV Computer Services
JB Software
Kirk Automation
Llamasoft
Meaconco
Microdeal
Micro Media Lomp Supplies
Mikes Computer Stores
Miniature Tool Company
Monitor
Moving Finger Company
Overbase
Page Six
Pyramid Video Software
Red Rat Software
Rombek
Silica Shop
SJB Disk Supplies
Software Express
Software Store
Sth West Software Library
Supertec
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Try Bridge
Twilstar Computers
Tynesoft
Ulteon
Vulcan Electronics

Bring this coupon to the Show to get 50p per person off the normal admission price of £3 (adults), £2 (children)
Valid for up to four people.

50p OFF

ATARI CHRISTMAS SHOW

Friday Nov 28, 10am-6pm
Saturday, Nov 29, 10am-6pm
Sunday, Nov 30, 10am-4pm

New Horticultural Hall
Westminster, Loodon SW1

AT12

Nearest Tube / Main line station. Victoria *Ample car parking nearby*

Good as new

[illegible] Star Raiders
[illegible] £14.95
[illegible] 48 [illegible] 3D [illegible]
the Atari 48 [illegible]
Rapid Software Services Ltd
4DX
Tel 01 309 1111

STAR Raiders was introduced in 1979 when the Atari 400/800 machines were launched so Star Raiders II represents a landmark in Atari history

Does it shape up Is it worth buying the new one and is it as good as the original?

The answer is yes but don't buy it expecting a carbon copy game with flashier graphics as it's a modified version of the unreleased The Last Star fighter

Seven years on and the Zylons are up to their old tricks this time with better weapons They have improved their defences and have the capacity to introduce more ships into the fray

To defeat them you will have to protect the cities of the Celos IV star system and destroy the attack bases of the Procyon star system where the Zylons build their new ships

Each star system has a number of planets with cities or attack bases and to succeed you will have to warp between and around the systems

There's a revolutionary representation of the star systems with planets moons and suns looking more like pages from a colour encyclopedia than a computer game

Also shown are space stations and Zylon squadrons in transit

When you select a planet on the System Chart you're given a lot of information including the number of cities or attack bases there the type of terrain and the number of enemy ships surrounding it

When you warp there the planet is represented as a scrolling landscape below you

Liberty Star doesn't handle too well in combat She doesn't seem to turn at all and there is no aft view

She won't pull up or dive when engaging enemy ships and you can't adjust your speed in deep space

The Zylon ships tend to present themselves to be shot down so there is no hunting in this game

A different type of enemy ship appears when a predetermined number of lower types are destroyed

Be careful – I have often hit a Fly Fighter seen it catch fire and then had it fire back at me in its death throes

Docking is fully automated which is just as well as your ship has very small fuel tanks

Refuelling and repairs take a large portion of your time but there is no penalty (save losing a city or two) at judgement time

I heartily recommend this game probably the best to have appeared since Star Raiders I The number of tasks involved mean that any limitations are satisfactorily overcome **Rob Anthony**

Sound	9
Graphics	9
Playability	9
Value for money	9
Overall	9

Pitching it right

[illegible] Hardball
[illegible] £7.95 [illegible]
£ 1.95 (disc)
[illegible] US Gold Unit 2/3
Holford Way Holford B
[illegible]gham B6 7AX
Tel 021 356 3388

HARDBALL is the first simulation for the Atari of the very popular American sport baseball

On loading a series of choices are presented covering two player and computer versus player games A management screen details team members and offers the opportunity to substitute men or move them about the field Action then passes to the main screen which is split into two sections

The upper half shows the pitcher and the batter with the catcher and the umpire who looks like an overgrown gorilla behind the batter

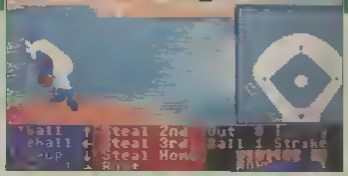
On the right is an inset diagram of the whole pitch on which the running men may be seen

The lower portion of the screen gives details of the scores and displays the batting and pitching choices in large red and blue boxes

Each player chooses a batting or pitching method by using his joystick and pressing the fire button

The pitcher then chooses where to place the pitched ball and the catcher will move his glove to the relevant position

The ball is pitched and the batter now has to try and hit it by choosing a direction with the joystick and swinging the bat by pressing the fire button



If he misses the ball a half view of the field appears showing the running men and the fielders chasing the ball

If he misses the umpire will call Strike and providing the batter has had less than three strikes against him another pitch may be made After three strikes a batter is out

After three dismissals the whole team is out and the teams change over The game ends when both teams have batted nine times

Music plays throughout the game and although you can turn it off there are several different tunes

Graphics are brilliant especially the movement of the pitcher However it is very difficult to play at first and takes several hours of practice to hit the ball regularly **Stephen Foster**

Sound	10
Graphics	10
Playability	4
Value for money	7
Overall	7

South Pacific



Graphic Screaming Wings
[illegible] £7.95 (cassette) £9.95 (disk)
Supplier Red Rat 15 [illegible] Street Manchester M4 7DU
Tel 061-835 1055

IF you've ever fancied yourself as a pilot taking on hordes of enemy aircraft single handed then this is your type of game.

Fans of the arcade game 1942 will no doubt notice more than a passing similarity although the enemy seem to have adopted different attack tactics.

You command a Lockheed Lightning Fighter taking on the waves of Japanese fighters and bombers that come swooping in as you patrol the South Pacific.

You take off from your carrier at the start of each level and land again before the next proving you survive.

Destroying certain planes gives you limited extra firepower or Destructor Smart Bombs.

Your plane can also perform up to three loops to get out of those awkward little situations but you do get an extra bonus for keeping them.

As these are operated by the spacebar you usually end up not being able to use them to any great advantage anyway.

The larger fighters take a bit more killing and the bomber almost refuses to be shot down which means using different strategies on different planes.

Fortunately all is not lost for occasionally you are joined by another plane which acts as a shield for a while – who said chivalry was dead.

Joystick response is good although I felt the plane was a bit restricted as it is confined to the lower quarter of the screen.

The game is quite addictive with a definite feeling of just one more go whenever you lose all your lives.

Graphically the game falls down a bit – the planes are rather uninspiring especially your own.

The background is quite well designed and scrolling is very smooth and the planes swoop and turn quite convincingly.

Some planes seem to have the ability to fly backwards (pretty clever these Japanese) but this doesn't really detract from the game.

Sound effects are good but an unimaginative tune plinks away in the background. However you can turn the tune off but leave the sound effects on.

Overall Screaming Wings is a fairly average shoot 'em up.

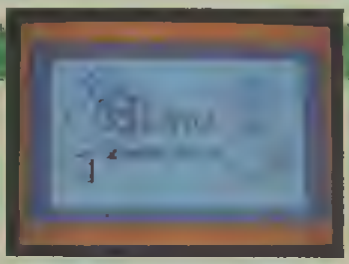
It'll keep you occupied for a few hours but the lack of variety in later screens and having only one level means once you have played it a few times the appeal fades.

At the price it is worth trying it out before parting with your money.

Mark Fowlis

Sound	8
Graphics	7
Playability	8
Value for money	7
Overall	7

Humble servant



[illegible] The Slave
Price £ 9.95 [illegible]
Supplier [illegible] Agard Street Leeds Dct 1D [illegible]

THE Slave is a suite of programs which allows you to write an adventure of up to 170k which will then reside on one side of a disc.

First you should map out your adventure on paper ensuring it is as close as possible to how you wish it to turn out – testing and correcting your adventure is not the easiest thing to do.

You can now define your location descriptions (which can be up to a full page of text) messages objects and verbs/nouns – up to 255 of each.

An excellent feature Examine is available to provide a more detailed description of an object if necessary.

Each verb or noun can have several synonyms thereby increasing the vocabulary.

The Exits editor allows up to 10 exits to be defined for each location.

If you have ever written or attempted to write an adventure you will know of the usefulness of flags. Well The Slave is equal to the task with the ubiquitous 255.

Some are pre defined for example the number of objects carried.

Now comes the hard work!

To solve your adventure a player will require actions/replies to the commands he enters. To write the logic for these responses you are given SAL The Slave Adventure Language.

SAL is a language akin to a powerful Basic. It has 73 main commands but these can be combined to give over 244 variations some of which enable you to introduce sound music and colour changes into your masterwork.

After you have produced all the necessary files you are shown how to bring them all together to form the finished adventure.

The Slave also includes a debugging program and a facility to design a simple title page using Graphics 0 characters.

The 126 page manual although well written and at times amusing is occasionally [illegible] difficult to understand but careful [illegible] will eventually clarify [illegible] doubt.

All in all The Slave is excellent value and a must for any budding adventure writers.

Ken Grassham

Ease of use	7
Content/Facilities	10
Documentation	8
Value for money	10
Overall	9



Application Form

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AT 85

Classic mould

Program Starquake
Price £8.95 (cassette) £12.95 (disc)
Supplier Bubble Bus 87 High Street Tonbridge Kent TN9 1RX
Tel 0732 355962



COME on admit it There must have been a time or two when you've cast an envious glance at those arcade adventures from Ultimate for the Spectrum and wished they were available for your Atari

Be jealous no more Bubble Bus has produced Starquake an original program but one that is graphically very much in the mould of those earlier Ultimate classics

You control Blob an owlish little dumpling who must scour the caves of an alien planet and amass various items

The planet's core has gone critical – Blob's job is to find it fill it with the right objects and thus stabilise it Ah the wonders of modern technology!

Blob is delightfully animated scurrying this way and that along terra firma as he explores the caverns

Being subject to the normal rules of gravity when he trundles off the edge of a precipice he falls until he meets the ground again No damage is done unless he strikes something nasty on the way down

His freefall can be slowed by pulling back on the joystick This causes a small platform to appear under him and stop him dead

This facility can also be used on the ground – fast and repeated pulling back on the joystick erects a ladder of these dissolving platforms which can be used for getting at otherwise inaccessible places

Blob can also get airborne by alighting on what looks like a white breeze-block. Once on the can fly merrily around the caverns

Another fast way of travelling is by using one of the transporter booths To activate you must guide Blob into a booth type in the code of any of the other booths and bingo – he's there

There are hundreds of different caves each one a separate screen Wander off the edge of the screen and another pops up

The caves are filled with alien vegetation machinery and neatly animated flying foes

Energy is lost each time Blob is touched by an alien (but he can zap them) and he loses a life if he blunders into such fatal items as sparking machinery or a spiked plant

Blob has 5 lives and a limited amount of energy zap and platform-building power

Everything about Starquake impresses from the title screen to the high-score table from the use of colour and sound to responsiveness and playability

Bubble Bus has produced a superb game Starquake is top-notch fare quality dripping from every byte

Bob Choppell

Sound	*8*
Graphics	*10*
Playability	*9*
Value for money	*10*
Overall	*10*

Modest tasks

Program Quest For Eternity
Price £7.95
Supplier Bug Byte Liberty House 222 Regent Street London W1R 7DB
Tel 01-439 0666



FANCY doing something unusual today like becoming an overlord of the universe? That's the modest task this text adventure sets you

To achieve your ambition all you have to do is get an out of order teleport booth back in working order

The snag is that this booth is situated on a somewhat hostile planet over 2000 light years away

You start onboard the starship Nebula which is itself out of action – does nothing work in this part of the galaxy? Finding out how to get the ship going is your prime task

On the flight deck there's a control panel terminal and viewscreen but try as you might there doesn't seem any way of bringing them to life

Up by the main drive units the deflectors irradium level seems pretty low – perhaps that's something to do with it

A large crate in the hold possibly holds a clue but how do you get it open?

You could always try leaving the starship via the airlock but that results in suffocation through lack of air

Wearing a discarded space suit doesn't help either – its air level is zero This opening sequence should give you plenty to think about

The display is fairly conventional Your location possible exits and visible items are described in the top half of the screen while input and response appear in the lower half

There's no scrolling – the screen clears each time you execute an action that carries a positive result

The game's vocabulary consists of 99 verbs and 162 nouns commands being of the usual verb noun format

If a command is not recognised by the program it helpfully tells you whether it is the verb or the noun that is not understood

The descriptions are fairly detailed and there are over 70 locations to explore

The text is literate the game well organised and despite the program being written in Basic response time is fast

Quest For Eternity is an enjoyable if unoriginal adventure At the price well worth buying

Bob Choppell

Sound	*n/a*
Graphics	*n/a*
Playability	*7*
Value for money	*8*
Overall	*8*

Four channel model controller

Part 7 of LEN GOLDING's series on using your Atari to control devices

If you've ever wanted to link your Atari to Lego and Meccano kits, slot-car racers, miniature railways or computer-driven buggies this model controller is for you. It can even handle your Christmas Tree lights!

The controller provides independent on/off switching for up to four motors, relays, solenoids or other low-voltage devices. It can also operate as a four channel speed controller, or as a two channel reversing switch so you can make a buggy move forwards, backwards, left or right at different speeds under full software control.

Each channel can drive a dozen torch bulbs for childrens' disco displays – including chaser lights – and there are even some limited applications in robotics.

Figure I gives the circuit in schematic form. Each of the four outputs is driven by a two-transistor power switch which enables the tiny currents and voltages from the joystick port to control currents of up to 5 amps and voltages of up to 24V at the outputs.

We explained transistor switching action back in the second article of this series (*Atari User*, July 1986).

Figure II shows the printed circuit board pattern for those of you who want to etch your own, but as usual a commercially-made PCB is available from RH Design.

The component layout is shown in Figure III and construction is very straightforward so that anyone can attempt it. Start by soldering the resistors and diodes, making sure the diodes are connected with their silver bands to the top. Then fit the BC108 transistors and all connecting blocks.

Bend the leads of each TIP127 transistor at right angles and spread

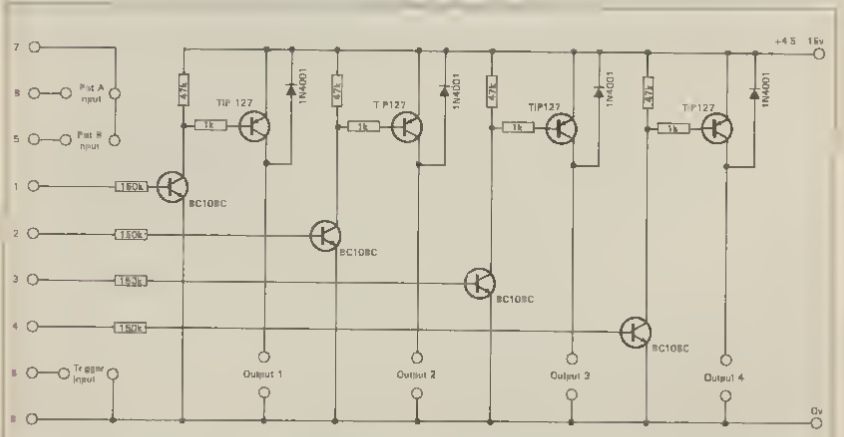
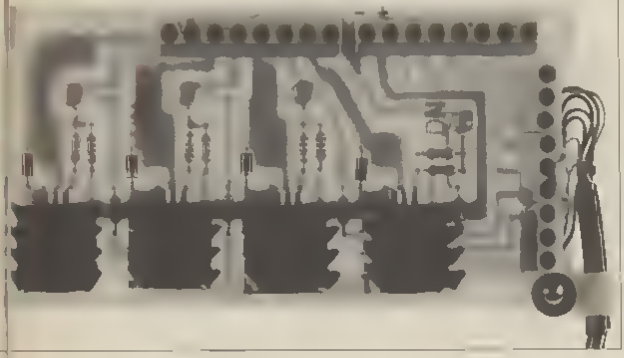
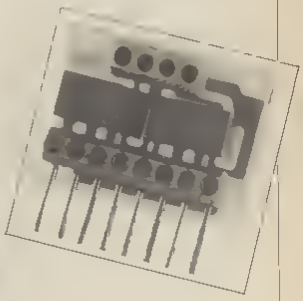


Figure I Circuit diagram for main board





them slightly to fit the PCB holes Smear a small amount of silicon grease on the back of each transistor then bolt the four transistor and heat sink assemblies into place *before* soldering the leads

Make sure that the heat-sink vanes cannot touch each other or the gadget will not work properly

Cut the joystick cable to length discarding the socket end then wire each of the nine leads to its appropriate point on terminal block 1 as indicated in Figure III Use a P clip to secure the joystick cable and take any strain

Motors require far more current than a joystick port can provide so the next thing you need is some kind of low-voltage DC power supply This design allows a very wide latitude – anything from 4 5V to 24V is acceptable

At high output currents the voltage delivered to your load may be almost 1V less than the full supply voltage

A properly stabilised mains power supply unit is best but these are expensive and not really necessary for things like motors solenoids relays lamps and other non-electronic devices Battery eliminators intended for transistor radios or computers give good results but the cheap ones cannot usually supply currents above 1 amp

DC power packs designed for model railways slot cars and construction sets will work quite well and even a car battery charger should give acceptable results though the output

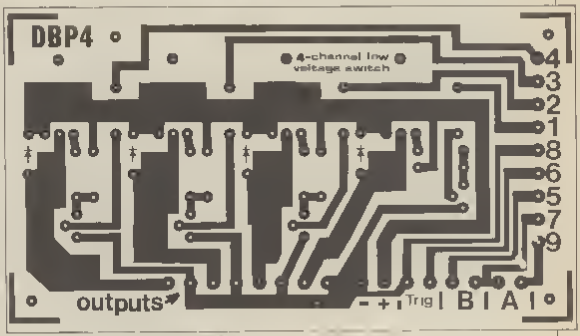


Figure II PCB foil pattern (exact size)

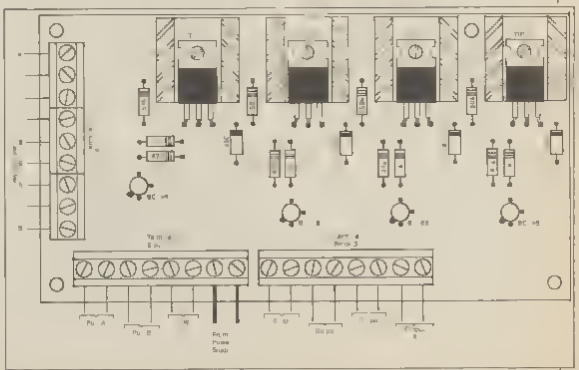


Figure III Component layout on reverse side of PCB

from all these devices tends to be unstable

A 12V car battery charger for example may deliver 18V or more under no-load or light load conditions falling to 12V or less when supplying several amps These voltage fluctuations will affect the speed of most model motors so you may find things tend to slow down as more channels are switched in

If you plan to run any other types of device – especially if you are considering running electronic units such as radios or tape recorders – then it is best to stick to using properly regulated power supplies

Lead-acid accumulators give a good clean stable output and can supply extremely high currents but they need careful handling Dry batteries are safest though expensive and rechargeable nickel-cadmium cells may be worth considering

Whatever type of power supply you choose its output must be wired to terminal block 2 as shown in Figure III Take great care not to reverse the positive and negative leads or you could damage the transistors

Each output transistor can easily handle 1 amp continuously and up to 5 amps for periods of a few seconds If you plan to draw steady currents above 1 5 amps you will need to use larger heat sinks

Programming the device follows the familiar pattern Start by setting up the joystick ports for output (first line of Program I) then POKE a number from 0 to 15 into address 54016 to switch on your chosen combination of channels Table I shows all the possibilities

Program I is a simple demo which switches on each channel in turn so if you connect a line of four torch bulbs you will see a chaser effect

An attractive animated display can be made from an old set of Christmas tree lights Assuming your set of lights takes 12V bulbs you will find that there are 20 bulbs in the set wired in series This means each bulb receives one twentieth of the 240V mains supply – or 12V

Cut the flex half-way between each bulb untwist the tails to each holder and re-wire the bulbs in parallel You could wire different coloured bulbs to each of the channels and have an attractive multicoloured light sequencer for Christmas

There is no reason of course, why you shouldn t extend the wires with some two-core flex and run your Christmas tree lights from your Atari this year! Just remember to keep the bulbs in parallel with each other

If you re using motors you can introduce an element of speed control by switching the power on and off in rapid pulses Program II shows the conventional way of doing this using a variable mark/space ratio

A short burst of power (the mark) is applied followed by a short off period (the space) By choosing appropriate values for *MARK* and *SPACE* you can usually reduce a motor s speed by as much as eight times before its movement becomes too jerky

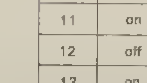
Try for example setting *MARK* = 1 and *SPACE* = 8 Program II operates with channel 1 but you could apply the same principle to any of the channels

Some applications – such as buggies and robot arms – need a controller which can change a motor s direction of movement Most model motors can be reversed simply by changing the polarity of their supply leads and Figure IV shows

Number in 54016	Channel 1	Channel 2	Channel 3	Channel 4
0	off	off	off	off
1	on	off	off	off
2	off	on	off	off
3	on	on	off	off
4	off	off	on	off
5	on	off	on	off
6	off	on	on	off
7	on	on	on	off
8	off	off	off	on
9	on	off	off	on
10	off	on	off	on
11	on	on	off	on
12	off	off	on	on
13	on	off	on	on
14	off	on	on	on
15	on	on	on	on

Table I Output switching from Port 1

```
1 REM Gadgets Part VI  4-channel low
      voltage switch
2 REM Program 1
3 REM
10 POKE 54018,56 POKE 54018,255 POKE 5
4018 OR POKE 54016 0 REM set up joysta
ck ports for output
20 RESTORE 70 FOR N=0 TO 3
30 READ B REM Get channel control numb
er
40 POKE 54016,B REM Turn channel on
50 FOR M=1 TO 80 NEXT M REM sets speed
 of chaser effect
60 NEXT N GOTO 20
70 DATA 1,2,4,8
```




```
LINE CHSUM  LINE CHSUM  LINE CHSUM
   1 14133     2  3181     3  871
  10 19718    20  4517    30  9342
  40  7584    50 12459    60  1080
  70  2014
```

Program I

how to do this with Double Pole Double Throw – or DPDT – relays

Each relay is run from two channels – one for the on/off function and the other to select forward or reverse. Any DPDT relay will work provided the coil and contact ratings suit your application.

An add-on PCB (DBP5) is available for use with two of Maplin's ultra-miniature relays which can each handle 2 amps at up to 24V. Choose the coil voltage which best suits your power supply – 6V types will operate on 4.5V to 7.5V while 12V types work on 9V to 15V.

The foil pattern and layout for this PCB are shown in Figures V and VI. The 8-way terminal block is connected pin for-pin to terminal block 3 on the main board using flexible wires or rigid pins cut from 2.5 sq mm mains cable. Table II gives the numbers to POKE into 54016 for the various output operations in this mode.

You might like to consider building a Lego model tank with a separate motor for each track or a model car with some kind of servo to operate the steering. You could fit only one reversing relay and still have two on/off channels available – to control a model train and two signal lamps for example.

Number in 54016	Left Motor	Right Motor
0	off	off
1	off	off
2	forward	off
3	reverse	off
4	off	off
5	off	off
6	forward	off
7	reverse	off
8	off	forward
9	off	forward
10	forward	forward
11	reverse	forward
12	off	reverse
13	off	reverse
14	forward	reverse
15	reverse	reverse

Table II Reverse switching from Part 1

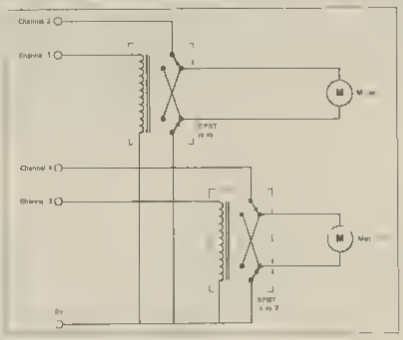


Figure IV Circuit diagram of motor controller board

```
1 REM Gadgets part VI  4 channel low
      voltage switch
2 REM Program 2
3 REM
10 POKE 54016,50:POKE 54016,255 POKE 5
4016,00 POKE 54016,0
20 PRINT "SET MARK,SPACE" INPUT MARK,S
PACE:REM Set speed
30 POKE 54016,1 REM Switch on channel
1
40 FOR N=1 TO MARK:NEXT N REM "On" per
iod
50 POKE 54016,0 REM All channels off
60 FOR N=1 TO SPACE:NEXT N REM "Off" p
eriod
70 GOTO 30
```




```
LINE CHSUM  LINE CHSUM  LINE CHSUM
   1 14113     2  3105     3  871
  10  9297    20 11328    30 8256
  40  8171    50  7038    60 8229
  70  1428
```

Program II

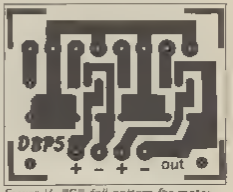


Figure V PCB foil pattern for motor controller board

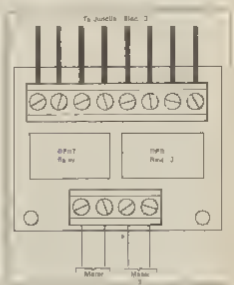


Figure VI Component layout on reverse of motor controller PCB

External sensors can be connected to the main board at terminal block 2 as shown in Figure III. Joining the two pins marked Trig will cause the number in address 644 to change from 1 to 0. Try wiring a microswitch to operate when your buggy hits an obstacle or when a robot hand closes.

The other two inputs (Pot A and Pot B) each measure the amount of electrical resistance between their two contacts and store the result at address 624 (pot A) or 625 (pot B).

A 470k variable resistor placed across one of these lines will return a number from 1 to just over 200 and this could be used to measure the degree of rotation in a servo shaft or the angular movement of a robot arm.

Alternatively you could fit a cadmium sulphide cell whose resistance varies according to the level of

illumination – see *Atari User* June 1988. Arrange for your train or slot car to break a beam of light when it passes a given point and you have the basis for an accurate position sensor or lap counter.

That should give you plenty to think about over the Christmas holiday period. Why not try out some ideas of your own and let us know how you get on? ■

All components available from
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SS6 8LR
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Circuit boards are available from
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137 Stonefall Avenue
Harrogate
North Yorkshire
HG2 7NS
Tel 0423 508359

Main printed circuit board (DBP4)	£3.10
Relay Board (DBP5)	£0.46*

*plus 20p postage if not ordered with main board

PARTS REQUIRED

Main Board		Maplin Codes
4	6C108C transistors	QB32K
4	TIP127 transistors	WQ74R
4	Veined heatsinks	FL56N
4	1N4001 diodes	QL73Q
4	150k resistors (brown/green/yellow)	M150K
4	47k resistors (brown/violet/orange)	M47k
4	1k resistors (brown/black/red)	M1K
3	3 way pc terminal blocks	RK72P
2	8-way pc terminal blocks	RK38R
1	Cable P clip 3 16	LR44X
1	Tube silicon grease	HQ00A
1	Pack 6BA x ½" bolts	BF06G
1	Pack 6BA nuts	BF19U
		Approximate cost £9.80

Relay Board		
1	8 way pc terminal block	RK38R
1	4 way pc terminal block	RK73Q
2	Ultra-miniature DPDT relays	BK48C (6 volt)
		YX95D (12 volt)
		Approximate cost £3.85

A joystick extension lead is available from Tandy stores (code 276-1978) or from large computer shops priced around £3.30

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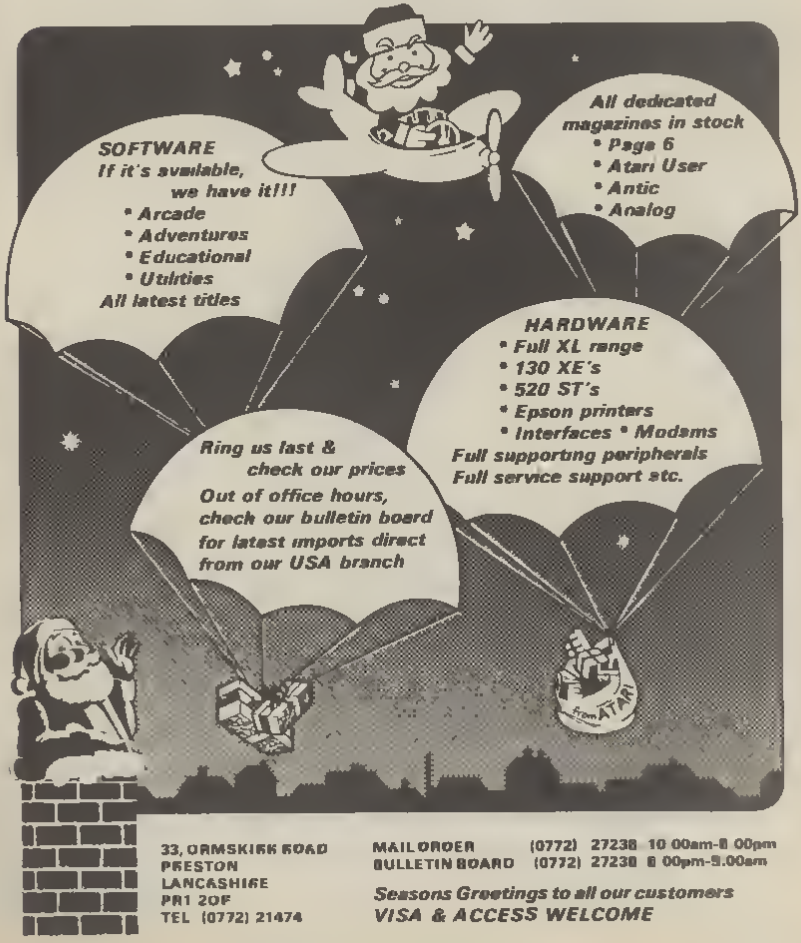
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Bargain of the year

By Brillig

WHEN you wake up early on Christmas morning and reach out to dispel the shadows by turning on your trusty brass lantern, what adventure will you hope to find stuffed in your battered leather knapsack at the foot of your pile of straw?

Perhaps you've already made up your mind. If not, get out a piece of your best parchment with your gold quill, write the words Jewels of Darkness on it, address it to Santa c/o the North Pole and shove it straight up the chimney.

Who shouted that there's no such person as Santa Claus? How dare you call yourself an adventurer!

Published by Rainbird and available for both the ST and 8 bit Atari computers, Jewels of Darkness is a collection of three superb early adventures from Level 9.

The trilogy comprises Colossal Adventure, Adventure Quest and Dungeon Adventure. All have been comprehensively updated to include graphics – no less than 600 coloured illustrations – a 1,000 word vocabulary, multi-command input, multi-tasking (type ahead regardless of what's happening on the screen), and incredibly fast response times.

Even without all that technological wizardry these adventures would still be among the best around. Colossal Cave is an all-time classic and this version is rated by many, including my humble self, as the finest ever. No self respecting adventurer worthy of the name should be without it.

And just what king's ransom does this regal collection cost, I hear you ask in trepidation? My raven fell off its perch and almost died laughing when I told it, so brace yourself for a shock.

For the 8 bit Ataris you get this imperial trilogy on three separate cassettes or one disc, handsomely boxed, complete with a 64 page novella, for the incredibly low price of £14.95. That's less than a fiver an adventure, not counting the smashing packaging and book. The ST version costs slightly more, at £19.95.

So there you are. Jewels of Darkness has got to be the adventurer's bargain of the year. And Rainbird promises more of such delights. Watch this space.

To give you some more ideas for Christmas presents, whether for your friends or yourself, I've listed my 20 favourites.

Plenty of Infocom titles there, but they happen to be the crown princes in my book. I know of no better reason for owning a disc drive than being able to play Infocom adventures.

Now to this month's hints and tips. Nigel Morse from Doncaster wants to know how to deal with the snowman and the dragon in Rainbird's The Pawn. Nigel's difficulties with the snowman are dealt with in Hints 'N' Tips, but can anyone tell me how to get Nigel past the dragon?

Dragons have also stumped Eric Nolan of Dublin. These creatures seem to cause adventurers more problems than anything else. Eric needs help with those in Enchanter and Feasibility Experiment. In the latter he'd also like to know how to light his lamp.

Eric has another problem – can anybody tell him where he can find the drum for the soldier ants in Return To Eden?

Next issue I'll be back with more hints and tips to aid you in your struggles, together with the start of a reader's Lifeline corner. If you'd like to be listed in Lifeline write in with your name, address and which adventures you can help others with.

Until then, I wish you a joyous Christmas and an adventurous New Year. ■

BRILLIG'S TOP SCORE

1. **Hitch-Hiker's Guide to the Galaxy** *(Infocom)*
2. **Jewels Of Darkness** *(Rainbird)*
3. **Zork I** *(Infocom)*
4. **Planetfall** *(Infocom)*
5. **The Pawn** *(Rainbird)*
6. **Lords of Time** *(Level 9)*
7. **Pirate Adventure** *(Adventure International)*
8. **Zork II** *(Infocom)*
9. **Trinity** *(Infocom)*
10. **Enchanter** *(Infocom)*
11. **Adventureland** *(Adventure International)*
12. **Sorcerer** *(Infocom)*
13. **Spellbreaker** *(Infocom)*
14. **Price of Magik** *(Level 9)*
15. **Lords of Kharma** *(Avalon Hill)*
16. **Golden Baton** *(Channel 8)*
17. **Wishbringer** *(Infocom)*
18. **Zork III** *(Infocom)*
19. **Mordon's Quest** *(Melbourne House)*
20. **Sorcerer of Claymorgue Castle** *(Adventure International)*

HINTS 'N' TIPS

ENCHANTER – *Infocom*
To deal with the dragon
LLEP SRAD NOGE HTES U

THE PAWN – *Rainbird*
Snowman a barrier?
ETIH WEKA MOTE ULBD NANE ERGD ERXI M
Then simply
TIHT IWNA MWON STLE M

FEASIBILITY EXPERIMENT – *Digital Fantasia*
To overcome this dragon's fiery breath
FLES DLEI HSDN ANOP AEWE SU
To fix the lamp
KCIW ADNA LIOD EENU OY

ZORK I
Is the thief bringing you to grief in combat?
NOPA EWTS EBEH TSIE FINK YTSA NEHT
ERAU OYRE GNOR TSEH TEVA HUOY STNI OPER OMEH T
ELBA ULAV GNIH TEMO SMIH GNIV IGYB MIHT CART SID

Classics for Christmas

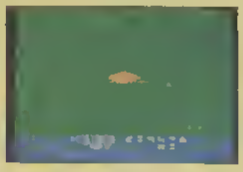
ANDRÉ WILLEY looks at the very best games, old and new, for Atari users

IT really doesn t seem twelve months since you were sitting round the dinner table tucking into that enormous Christmas turkey does it? But, 'tis the season to be jolly, and for many of our readers that means getting out all the old favourites – games which haven't seen the light of day since last Christmas. If you remember, the twins thrashed granny at Missile Command and Uncle Tom spent most of the afternoon trying to get his frog across the road . . .

For seasoned owners the Atari will naturally be a star performer at Christmas but spare a thought for the newcomers who took advantage of the marvellous Dixons and Currys bargain packs during 1986. They have probably never seen Frogger much less the other classics.

The problem is that alongside these masterpieces there was frankly a lot of rather highly priced rubbish. So if you're among that vast majority of Atari owners who don't remember the excitement of buying an original 16k Atari 800 for the bargain price of £645 read on and get a few ideas for this Christmas.

There can really only be one place to start when talking about all-time classic Atari games – and that is with **Star Raiders**. Released on an 8k cartridge at £34.95 (now available at under a tenner) this game was a milestone in the computer games industry. Indeed I know a good few



people who actually lashed out their £645 just to play this game and it still holds up well today.

Star Raiders is a space combat simulator with a through-the-window flight display. The aim is to defend your Starbases from attack by the evil Zylon empire.

To do this you hyperwarp your space ship around the galaxy to areas which your long range tracking system shows have a high Zylon fleet concentration. When you drop out of hyperwarp your short range trackers kick back into life and with the red alert klaxon ringing in your ears you engage the shields and the attack computer and commence battle.

As your on board systems sustain damage and you run desperately low on fuel you must choose your moment to warp out and dock with a friendly starbase for repairs.

Star Raiders is extremely addictive and a must for all serious games enthusiasts.

Staying with the space theme for a while there can be few who have not seen the arcade machine **Defender** and the Atari cartridge is one of the closest representations available. You have all the excitement and speed of the original blasting aliens like there is no tomorrow as you rescue people from the clutches of the evil galactic baddies.

If you liked Defender then you'll love **Dropzone**. This was released a little more recently but very quickly gained the classic label. The theme is the same as Defender but this time you play a space man with a jet pack and a laser gun.

No games overview would be complete without a mention of Space Invaders and there have been a whole host of variations on this arcade standard. The closest to the original machine is probably **De-Luxe Invaders** from Roklan but Atari's own **Space Invaders** cartridge is pretty good too.

The **Galaxians** cartridge has its merits in terms of fast moving aliens but the cream of the lot must be **Bandits** from Sirius software. I last saw this priced at £21.99, but it was worth every penny.

Each wave of aliens is different. Firstly a bunch of swooping and diving craft which are quite easy to knock off then craft that fly off into the distance every so often.

These are followed by ships made up of coloured spheres which will separate and bounce all over the place if you shoot them down. The next wave features centipede-like



aliens which snake their way towards you at an alarming pace.

As you progress through the levels these different types of ship gang up to try to obliterate you. Accompanied by some of the most original – not to say downright rude – sound effects I've heard for years, this game is one of my all time favourites.

One of the strangest computer games I've come across – and I highly recommended it – is **Joust.** You play a space-age knight in shining armour astride not a horse but a giant flapping bird

The controls are simple – left right and press the button to flap (gravity brings you down again often with a bump) Combat is straightforward but especially as a two player game in which both riders play on the same screen it is hard to beat for sheer enjoyment

Moving on from the space attack games there are a number of family



games The most obvious of these is **Pac-Man** – which I don't really think needs any further explanation other than to say that it is one of the best versions available on any micro even today

Frogger is another arcade classic which has made a successful move to the Atari home computer – complete with cars logs turtles and even Mrs Frog This one still has great appeal

Another Frogger-like game is **Preppie** – which features a little fellow who must cross the road and river in order to collect golf balls which have gone out of bounds Again this has lasting interest and some pleasant music

If you want a bit more of a challenge look no further than **Miner 2049er.** This is probably top of my own personal list of favourite arcade games simply because there is so much to it

You play Bounty Bob, a gold prospector who is trying to find his way through the radioactive mines Along the way there are radioactive creatures who kill on contact but which you can destroy after picking up certain objects – rather like Pac-Man's power-pills

The real appeal of Miner is that to complete each level you must leave your footprints on every bit of floor you can see – and that often involves a lot of leaping about not to mention using the teleporter lifts and falling down slippery slides at just the wrong moment

There are 10 completely different screens and as many difficulty levels of each screen – making screen 10/level 10 an almost impossible task This game is a must for all game-a-holics and no collection is complete without it – or its sequel Bounty Bob Strikes Back Still on the levels and ladders theme you should also look out for **Donkey Kong, Lode Runner** and **Popeye,** all of which still hold up very well today and provide hours of fun

If you wish to add a combat element to this idea you could try **Bruce Lee,** in which you take the part of our hero in trying to defeat the bad guys and exploring a temple at the same time

The simulation enthusiasts have not been forgotten in the Atari games field with the excellent **Pole Position** car racing game still selling well even if it has been a little out-classed recently by **ElectraGlide.**

Flight Simulator II and **Mercenary** both boast excellent 3D in-flight graphics with Mercenary having the added bonus of the space theme and lots of exploring and bargaining to do

Sports fans can try their hands at **Summer Games,** which is a real joystick wrencher and can be very compulsive when played in a four-some **Decathalon** is good too but I think that Summer Games just takes the edge

Martial arts fans who were not satisfied with Bruce Lee should take a look at **International Karate.** Although only released recently this will quickly become a classic and should feature in any serious games player's collection It allows you to take your karate more seriously with various kicks punches and moves available to you plus full scoring and match play rules

That collection should see you through December 25th However when Boxing Day comes around and the relatives have all gone home how about sitting down with something a bit more brain taxing – and what better choice than an Infocom adventure?

Adventures are not everyone's cup of tea but if you want one that will appeal to almost anybody give the **Hitch Hiker's Guide to the Galaxy** a try You may be stuck on it till next Christmas but whatever else you do you'll keep on coming back to it for one more try

The characters are well rounded the puzzles intriguing and infuriating and the situations really zany It took me absolutely ages to get through the screaming door on the Heart of Gold spaceship but that feeling of euphoria as it finally slid open surpasses any amount of alien-blasting

In this brief survey I haven't really been able to scratch the surface of the enormous number of games available for the 8 bit Atari For example it would be well worth your taking a look at such all-time hits as Caverns of Mars Sea Dragon Encounter and Missile Command

Hopefully I have been able to give some of the newer owners a few ideas for Christmas and reminded the old faithfuls to dust off the cartridge box, get out the spare joysticks and have a very Merry *Atari User* Christmas ■

The titles mentioned are available from the following suppliers

Missile Command, Caverns of Mars, Star Raiders Defender Space Invaders, Galaxians Joust and Donkey Kong – Atari

Frogger – Sierra On-Line*

De-Luxe Invaders – Roklan*

Sea Dragon Dropzone, Preppie Bounty Bob Strikes Back – Americana

Bruce Lee, Pole Position, Lode Runner, Summer Games – U S Gold

Bandits – Sirius Software*

Miner 2049er – Sirius Software*

Popeye – Parker Brothers*

ElectraGlide – English Software

Flight Simulator II – Sub Logic Corp

Mercenary and Encounter – Novagen

Decathlon – Activision

International Karate – System 3/Activision

Hitch Hiker's Guide to the Galaxy – Infocom

*Indicates no longer easily available but with a little hunting about readers could probably find some old stock

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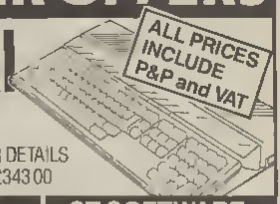
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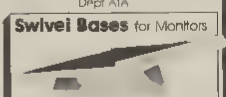
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SANTA'S GRO

Have some festive fun with MIKE ROWE's latest game

IT'S Christmas Eve and all over the country stockings are being hung and chimneys swept in preparation for the following morning. All is happy and cheerful and the world is at peace.

But wait ... at the North Pole all is not so well – poor Santa is in a panic. He's polished Rudolph's nose, checked the oil level and tyre pressure, got his AA route map ready and is about to depart when he finds the boot of his sleigh is empty. Those mischievous little elves have pinched all the presents and hidden them!

Only six hours to go to Christmas Day and the presents are scattered throughout the catacombs of Santa's Grotto. Your is to guide Santa around the catacombs collecting as many presents as possible before the time is up.

To make things worse, the elves have hidden several sacks in rooms where you will have to solve a puzzle to get at them. Each sack contains 10 presents so it's worth going for them, but remember that you cannot waste too much time in these rooms as Santa doesn't want to linger.

Luckily Santa has a map of the catacombs but unfortunately it's difficult to fold and he can only see one small section at a time. So go to it – think of all the unhappy children tomorrow if you fail – not to mention the fact that your present might be in there somewhere!

Santa's Grotto is a one player game where the object is to rush around the 100 screen maze collecting as many presents as possible. Each time you play a completely new maze will be created. You control Santa with a joystick in port one and to collect a present all you have to do is touch it. The time limit is displayed at the bottom of the screen.

Not all presents are necessarily obtainable but you must get as many as you can before midnight. And there are 10 magic locations which will transport you to one of the elves' secret lairs. Here you will find a sack containing 10 presents but to get it you must solve a little puzzle.

At the end of the game the number of presents you have collected will be displayed and a rating of your performance will be given.

The program is commented with rems to give some idea of what's going on, although to save on typing these can be omitted without affecting the running of the game.

The main part of the game runs on a custom Display List screen which is largely made up of Graphics 2 lines with the maze being drawn using a custom character set. Santa is made up of two player missiles thus giving his two colours. He is moved using a small machine code call stored in *M$*.

Screen initialisation, the character set and the player missile graphics are done in lines 2000 to 25000 and the data for this starts at line 25000. The screen drawing routines begin at line 2000.

The main routine for the program is on lines 100 to 190 with subroutines for moving Santa at lines 50 to 95. These are put at the beginning of the program to give a little extra speed where it is most needed. Lines 200 to 990 control the puzzle solving sections.

Once you have typed it in don't forget to Save a copy before you run it. There is some machine code used which could crash the computer if mistyped.

If you have any problems typing it in don't forget to use Get It Right! to help you – or why not download a copy from MicroLink? ■




TTO

```
10 REM  START / CREDITS
12 REM  MAZE DONE BY SAM
14 REM  FOR ATARI USER
16 REM  COPYRIGHT 1985
20 GOTO 20000
50 IF Z=99 OR Z 100 OR Z=101 OR Z=102
OR Z 104 OR Z 107 OR Z=111 THEN RETURN
 :REM  DARK
55 FOR I 1 TO 16 STEP 2 XP YP=I 0 USR(
ADR(M$)  P14 YP+PM0+1024,201 0 USR(ADR(
M$)  P24 YP+PM0+1280,201 NEXT I RETURN
60 IF Z 95 OR Z 100 OR Z 101 OR Z 103
OR Z 105 OR Z 107 OR Z 110 THEN RETURN
 REM  UP
65 FOR I=1 TO 16 STEP 2 XP=TP Z1A=USR(
ADR(M$)  P13,YP+PM0+1024,20):A USR(ADR(
M$)  P23 YP+PM0+1280,20) NEXT I RETURN
70 IF Z 90 OR Z 99 OR Z 100 OR Z 104 O
R Z=105 OR Z=106 OR Z=109 THEN RETURN
 REM  RIGHT
72 A USR(ADR(M$)  P13,YP+PM0+1054,20) A
 USR(ADR(M$)  PZ1,YP+PM0+1280,20)
75 FOR I=1 TO 3 XP XP+1 POKE 53248,HP
POKE 53249,YP A 1+1 NEXT I RETURN
80 IF Z 90 OR Z=99 OR Z 101 OR Z=102 O
R Z 103 OR Z=106 OR Z 108 THEN RETURN
 REM  LEFT
82 A USR(ADR(M$),P12,YP+PM0+1024,20) A
 USR(ADR(M$)  P22 YP+PM0+1280,20)
85 FOR I 1 TO 3 XP HP 1 POKE 53248 HP
 POKE 53249 XP A 1+1 NEXT I:RETURN
90 FOR I 1 TO 40 NEXT I RETURN :REM  N
O  MOVEMENT
99 REM  MAIN LOOP
100 X INT 401/8 Y EXP 401/16 REM  CON
ST'N  PLAYER MISSILE TO SELECT COMMAND
110 Z PEEK(5C4+20+40) REM  WHAT AM I S
TUCK IN ?
120 TIME=TIME 1 POSITION 29 0 ' TIME
 TIME,' ' REM  TIMER ROUTINES
125 IF TIME(0 THEN GOTO 3000
130 GOSUB ROUTINE REM  ROOM SUBROUTINE
S
140 S SIICR(0)
150 ON S GOSUB 90,20 50,90,70,70,70,90
,80,80,80 90,50,60,90
190 GOTO 100
199 REM  MATERIAL MAZE SUBROUTINE
200 IF K(0 THEN GOTO 2000 REM  DEF SCR
EEN
210 IF K)19 THEN GOTO 2100
220 IF Y(0 THEN GOTO 2200
230 IF Y)9 THEN GOTO 2300
250 IF Z 240 THEN GOTO 400 REM  ESCAPE
 OK PRESENT SCORE & TURN
260 IF Z 241 THEN GOTO 300 REM  BACK
290 RETURN
299 REM  DEF BACK
300 FOR I 15 TO 0 STEP  1
310 SOUND 0 I 0,I
320 NEXT I
330 FOR SCR 0 TO 9
340 IF SCR(5(SACK) RNDM THEN POP  GOTO
 350
350 NEXT SACK
355 SACK$(SACK)=255 PRES(RNDM) 255
360 GOTO 1900:SCRNT00
399 REM  PICK UP PRESENT
400 FOR I 15 TO 0 STEP  1
410 SOUND 0 I Z I
420 NEXT I
430 GOSUB 2500:ATI(RNDM)=I0
435 GOSUB 2500:C(RNDM)=I0
440 PRES(RNDM) 255
450 DOES PRES=1
460 POSITION 0,0:? PRES;" PRESENTS"
490 GOTO 100
499 REM  PRESS BUTTONS ROOM
500 IF Z(50 THEN RETURN
510 IF INT(TRY/2)*2=Y/2 THEN SOUND 0,200
Z I0 'PRESS' WRONG   SIGHT AGAIN' GOSU
B 900:TRY=TRY-1:GOTO 520
5A0 FOR I=15 TO 9 STEP -0 5 SOUND A,50
,I0,I NEXT I
55A IF TRY 3 THEN 'PRESS  WELL DONE   A
 SACK OF I0 PRESENTS' GOSUB 900 PRES P
RES+I0 GOTO 590
580 IRY IRY+1
570 POKE 53248,192 POKE 53249,192 HP=1
92
575 SOUND 0 0,0,0
580 RETURN
590 XP OLDXP YP OLDYP POKE 53248 HP PO
KE 53249,XP ROUTINE 200
595 POSITION 0,0 ? PRES," PRESENTS" GO
TO 2312
599 REM  TRAP FROM 'CHOOSE DOOR'
600 IF Z 51 THEN TRY=3 SETCOLOR 0 0,10
 GOTO 550
610 IF TRAP()3 THEN 640
620 IF RND(0)(0 05 THEN TRAP=15
630 GOTO 680
640 IF TRAP()15 THEN 660
650 IF RND(0)(0 1 THEN TRAP 3
652 IF RND(0)(0 1 THEN TRAP=11
655 GOTO 680
660 IF TRAP()11 THEN 680
670 IF RND(0)(0 1 THEN TRAP 15
680 SETCOLOR 0,TRAP,10
685 IF S()15 AND TRAP=3 THEN TEXT$ 'YO
U HEAT THROUGH 0 ATO 115A1''':GOSUB 900
 SETCOLOR 0 0,10 GOTO 590
690 RETURN
699 REM  TRAP BUTTONS ROOM
700 IF Z 52 THEN POO I 0 10 205:SOUND
0,1 10 10 NEXT I TEXT$ 'YOU FELL DOWN
A TRAPDOOR!'  SOUND 0 0,0,0
710 IF Z 56 THEN GOSUB 900 SETCOLOR 0,
0 10 GOTO 590
750 IF Z=113 THEN TRY=3 SETCOLOR 0,0,1
0 GOTO 550
790 RETURN
799 REM  TRAPDOOR ROOM
800 IF X)19 OR X(0 OR Y)5 OR Y(0 THEN
 SETCOLOR 0-14 10:TEXT$='YOU LEFT THE M
AZE' GOTO 590
820 IF Z 49 THEN TRY=3 SETCOLOR 1,14 1
0 FOR I 1 TO 10 SOUND 0,100,10,10 NEXT
 I SOUND 0 0 0 0 GOTO 550
840 RETURN
899 REM  LEFT RIGHT ROUTINE
900 POSITION 0 2 ? TEXT$
910 FOR I 1 10 900 NEXT I
920 POSITION 0 2 ?
                  '
930 RETURN
999 REM  SACK PUZZLE 1
1000 GOSUB 2700
1010 ROUTINE=900 POKE 53277,0
1020 POSITION 6 2 ? 'A' POSITION 3,3:?
 'B' POSITION 5,4 ? 'C'
1030 SETCOLOR 0,11,10
1040 OLDXP=XP OLDYP=YP
1050 PRES(RNDM)=255 SACK(SACK)=255
1060 TEXT$="PRESS THE BUTTONS IN THE R
IGHT ORDER' GOSUB 900
1070 FOR I I 10 3 TRY(I) INT(RND(0)*24
1) NEXT I:TRY 1
1080 POKE 53248 192:POKE 53249,192 HP=
192
1090 POKE 53277,3*GOTO 100
```


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```
1099 REM  SACK PUZZLE 2
1100 GOSUB 2700
1110 ROUTINE 600 POKE 53277,0
1120 POSITION 3 1 ? '5' SETCOLOR 0 11,
10
1140 OLDXP=XP OLDYP=YP TRAP 11
1150 PRES(RNDM) 255:SACK(SACK) 255
1160 TEXT$ 'TROPEIC LIGHTS - SIOP ON R
ED'' GOSUB 900
1180 POKE 53248,192 POKE 53249,192 HP=
192
1190 POKE 53277 I GOTO 100
1199 REM  MAZE PUZZLE 3
1200 GOSUB 2700
1210 ROUTINE=700 POKE 53277,0
1220 FOR I=1 10 20 ?=INT(RND(0)*2800):I
F PEEK(5C4P)=0 THEN POKE 5C4P,52
1230 NEXT I POSITION 2,3 ? "Q"
1240 OLDXP=XP OLDYP=YP
1250 PRES(RNDM)=255 SACK(SACK)=255
1260 TEXT$ "MEMORISE & GOOD THE MIDDE
R TRAP DOOR5" GOSUB 900
1270 SETCOLOR 0,0,0
1280 POKE 53248 192:POKE 53249,192 HP
192
1290 POKE 53277,1:GOTO 100
1299 REM  SACK PUZZLE 3
1300 POSITION 0,1
1310 ROUTINE 800 POKE 53277,0
1320 POSITION 0 1 GOSUB 1610 GOSUB 161
0
```

```
1310 POSITION 0,11: ? "#"
1340 DLIST=XP+3:DLIST=YP
1350 FREE(FROM)-258 THEN ? "ERROR":GOTO 900
1360 TEXT$="INVISIBLE ANZE":GOSUB 900
1370 FOR I = 10 TO 0 STEP -2 : SETCOLOR
1,14,I:NEXT I:SETCOLOR I,0,0
1390 POKE 53248,200 POKE 53249,200 XP=
200
1390 POKE 53277,3 GOTO 100
1400 GOTO 1000
1500 GOTO 1100
1600 GOTO 1200
1700 GOTO 1000
1800 GOTO 1100
1900 GOTO 1700
1999 REM START MAZE
2000 A1 A1 1 14 A1=0 THEN R1=R1010
2010 POKE 559,0 POKE 53248,200:POKE 53
249,200 XP=200
2015 POSITION 0,1
2020 GOTO 2400
2100 A1 A1=1-2F A1>5 THEN R1=R1 10
2110 POKE 559 0=POKE 53248,48 POKE 532
49 48 XP=40
2115 POSITION 0,1
2120 GOTO 2400
2200 A2 A2 1 2F A2<8 THEN A2=A2+10
2210 POKE 559 0 YP 134
2212 POKE PMB 0 A USR(ADR(PM0),PMB,PM0
1,2048)
2214 0 USR(ADR(M$),1536,YP+1024+PMB,20
)
2215 POSITION 0,1
2220 A USR(ADR(M$),1536,YP+1280+PMB,20
)
2227 GOTO 2400
2100 A2=A2+1 IF A2>9 THEN A2=A2 10
2310 POKE 559,0 YP 40
2312 POKE PMB,0 A USR(ADR(M$),PMB,PMB+
1,2048)
2314 A=USR(ADR(M$),1536,YP+1024+PMB,20
)
2315 POSITION 0 1
2318 A USR(ADR(M$) 1536,YP+1280+PMB,20
)
2400 ROOM=INT(RND(0)*10
2410 GOSUB 2500+ROOM*10
2420 GOSUB 2500+RND(0)*10
2430 POKE 77,0 POKE 559,62
2440 IF PEEK(FROM)<250 THEN POKE 54*PR
EEK(ROOM)-240
2450 FOR I=0 TO 9 TF 54CHSET)) ROOM THE
N POKE 54CHRES+ROOM+I 241
2460 NEXT I
2470 GOTO 100
2500 ? "adjgsjgsjgsjghsjs:"
2501 ? "fkkjjjjjjfhjlfhljkk"
2502 ? "nksjfkjcjhghikdjfdfg"
2503 ? "jhlhekekhjjghkkhkfkh",
2504 ? "ikghkkkhkkfkghkkhonk#"(
2505 RETURN
2510 ? "ghkhghkdsghiiokksjg"
2511 ? "fkdjekoisjsjihgdjfhj ,
2512 ? "sghokkijfsjfkkmghgsj",
2513 ? "jjgsrekkisfhgksfhgmjj ,
2514 ? "fhjfhkkjfkkhkfkkkjfh",
2515 RETURN
2520 ? "gsfhkkkhghkijokksrgs"
2521 ? "jfdghkokmgijfkkkmmmj",
2522 ? "mgsjgdfajjcjgsgsfhkl",
2523 ? "jjfmjghkfhghjfhjekkh",
2524 ? "fhkfhfdghkhoakdikhkd'
2535 RETURN
2530 ? "gdcghksdksrfkkhsrgs"
2531 ? "fkkmosfhsfhomsgrfhj"
2532 ? "okkhjndfnksjjjfkkrs"
2533 ? "ghsjjjgsjehcjdghmj"
2534 ? "fhkfhfhjcfhksfhkkfh",
2515 RETURN
2540 ? "qkokkqohkkicmnnifks",
2541 ? "fighsjfkkksfhhsjsjh";
2542 ? "sjghjqdgrfkkkhjsjik";
2541 ? "jfhjghikhfkkkkkhjjis',
2544 ? "fknkkdfekkkkhkkkkihk",
2545 RETURN
2550 ? "  gsjekksfhkreokrsiki";
2551 ? "jjfksjikkifkkiifjcgw";
2552 ? "mfksrjgifkkifisfmeki"
2551 ? "jeihcjjjehsfsfdjgsj"
2554 ? "idjfkkfmfkkhgokkhjfh",
2555 RETURN
2500 ? "ekhqgifkksrjgigsjes'
2561 ? "ghkkjjfdgsjjfkfkfokkk',
2567 ? "mgighkkhfkfkkqsgjk'
2501 ? "gjefkkhqkkknkrfhjilb"
2560 ? "fhgkkkkjekkkkfkkkhgoh",
2505 RETURN
2570 ? "gdcokhsfkkkkhqsrjes";
2571 ? "isghesfkkhekkkfhjfkk'
2572 ? "sfokjfnkmakkhjgkokjg"
2573 ? "jhgsfijbjfhkdyjbqfih'
2574 ? "fhjfdfhjikkksfhfhikd'
2575 RETUHN
2500 ? "gsjnkkrcgqijihkdkfhd'
2501 ? 'cfhjgdfkkfhjcgkkokkh'
2502 ? 'sijjghkqkzikhghdohf"
2501 ? 'jjjjjjghdrjkkhghkj'
2504 ? 'fhjfohfnkkrcghkheneh"
2505 RETURN
2590 ? "gxfkkkicbgshisghifks"
2591 ? "jjekkkokohfnjfosfhse"
2592 ? 'mcgrgekkkkmjhhikajk',
2593 ? "fkhjjmksgsjjjfsjfj'
2594 ? "mkjfhfhhfksfhfhfkhjeh"
2595 RETURN
2600 ? 'qkkekmkokrejgsgrks',
2604 ? 'ighkkoksghjhiuhjjjghk"
2602 ? "mjgsgkjfohgkkhjcfho'
2601 ? "jfksfdjfksgokkkhgksj'
2604 ? "fgsfhkondfokmkkkhkcc"
2605 RETURN
2610 ? "gdfcighkghkkihkkkmgs'
2611 ? "jghkhjghkgrjekkohjj"
2612 ? "mjghkhuhgrjfokkrihml'
2611 ? 'jfokhksjjjjgiimjbcj";
2614 ? 'fhkkkkhjhfhsfhfikh";
2615 RETUHN
2620 ? 'gdfksghkhkiikkkkmgs',
2621 ? 'jghhjnkhgrjekkohjj',
2622 ? 'mjghkohgrjjiokkiikm1";
2624 ? "jfokhksjjjjgiimjbcj";
2624 ? 'fhgkkkhjfhjhjfhfhikh",
2625 RETURN
2700 POSITION 0 1 ? 'gnnnnnnnnnnnnnnnn
nns"
2710 FOR I = 10 TO 0 STEP -1
  NEXT I
2720 ? "ooooooooooooooooooh"
2730 RETURN
2999 REM END
3000 ? CHR$(125):POSITION 15 0 ? "Atar
i User
3005 POKE 756 224
3010 POSITION 2 2 ? "santas grotto
3020 POSITION 2 4 ? "PRES  PRESENTS
        COLLECTOR
3030 POSITION 0 0
3040 IF PRES(20 THEN ? 'THERE'S GOING
TO BE 0 LOT OF" ? "DISAPPOINTED CHILDR
EN" GOTO 3100
3050 IF PRES(60 THEN ? "AT LEAST SOME
PEOPLE WILL GET PRESENTS" GOTO 3100
3060 IF PRES(100 THEN ? "GOOD CHANCE
S WELL BE A HAPPY ONE'
3070 ? "EXCELLENT! HAPPY CHRISTMAS TO
ONE & ALL"
3100 IF PEEK(53279)=7 THEN POKE 53277
,0 RUN
3110 GOTO 3100
19999 REM INITIALIZE
20000 GRAPHICS 0
20010 OL PEEK(560)+PEEK(561)*256 REM
SET UP SCREEN WITH POSITION DISPLAY LIST
20020 POKE 755,0 POKE 757 1:POKE 82,0:
POKE DL+1,DL+2
20030 FOR I=6 TO 15:POKE DL+I,7 NEXT I
20040 POKE DL+16,2:POKE DL+17,2 POKE D
L+18,65 POKE DL+19,PEEK(560) POKE DL+2
0 PEEK(561)
20050 ROMTOP PEEK(1061 R RAMTOP*256 RE
M FIND TOP OF MEMORY
20060 SC PEEK(88)+PEEK(89)*256+48 REM
FIND TOP OF SCREEN
20070 SETCOLOR 1,14,10 SETCOLOR 2,0,0
SETCOLOR 3,7 0 SETCOLOR 0 0,10
20080 POSITION 1 2: ? #6;" S A M E A ' S" P
OSITION 4,4: ? #6;"0 1 0"
20090 POSITION 10 2 ? "By Mike Rowe 19
86' POSITION 15,0 ? 'Atari User"
20100 DIM CHSET$(512)
20105 RESTORE 20000 FOR I = 1 TO 40 READ
 Q CHSET$(I)=CHR$(A) NEXT I
20110 CH ROMTOP-8 CHBASE CH*256 A=USR
(ADR(CHSET$)+151,CHBASE 4)
20115 RESTORE 25000
20120 FOR I = 0 TO 459 READ A POKE CHBAS
E)*704+I,A NEXT I:REM INJECTS CHARACTE
RS
20130 FOR T=6400 TO 6404+7 POKE CHBASE
01,0 NEXT I
20200 DIM RT$(1001,PX$(1001 RT(0) 11 RAT
D1 10
```

```
20220 FOR I = 1 TO 99 :T(I)=-(D(I+1)-D(I))*8+(D(I+2)-D(I+1))*4+(D(I+3)-D(I+2))*2+(D(I+4)-D(I+3)):NEXT I :REM TO NORMALIZE VALUE
20230 DIM PMS$(100):FOR I = 0 TO 99 :PMS$(I)=CHR$(I):NEXT I:REM ALLOCATE PACKET FOR EACH LOOP
20240 PMS = 0
20250 DIM SAVE$(130):FOR I = 0 TO 2*50+15:SAVE$(I)=CHR$(PEEK(1536+I)):NEXT I
21000 DIM MS$(39)
21005 RESTORE 22000:FOR I = 1 TO 39 :READ A:MS$(I)=CHR$(A):NEXT I
21010 PMBASE = PEEK(106)-16 :PMB = PMBASE*256
:REM RESERVE MEMORY FOR PLAYER-MISSILES
21020 POKE 54279,PMBASE:POKE 623,12
21030 POKE 704,56:POKE 705,14
21040 RESTORE 22000:FOR I = 0 TO 159 :READ A:POKE 1536+I,A :NEXT I :REM MOVE TO SAFE AREA
21050 P1= 1536:P12 =1556 :P13=1576 :P14 = 1596 :P21 =1616 :P22=1636 :P23=1656 :P24=1676
21055 POKE 53248,48:POKE 53249,80
21060 RP=40 :PP=56
21070 POKE 53277,3 :POKE 559,62
21080 POKE PMB + 0 :USR(ADR(MS$)-1536 :P=PMB+384
21090 A USR(ADR(MS$)-1536 :P=P+1024+PMB :POKE P,0 :REM CLEAR PLAYER 1ST COLOUR
21095 A USR(ADR(MS$)-1536 :P=P+1280+PMB :POKE P,0 :REM CLEAR PLAYER 2ND COLOUR
21500 POSITION 0 :I=1 :GOSUB 22000
22000 ADRM = ADR(LINE-200
22010 GOTO TRY:I=1 :TRY = DIM :ENT$(40)
22010 POKE 756 ,CH/E
22040 TIME 2006
21050 POSITION 11 ,0 :? #6;" SCORE = ";SCORE
24990 GOSUB 2005
24995 REM ***LOAD***
25000 DATA 0 0 0,0 0 0,0 0 0
25010 DATA 255,129,129 129,129,129,129 129
25020 DATA 129 129 129,129,129,129 129 255
25030 DATA 255,1 1,1 1 1,1 255
25040 DATA 255 128,128,128,128,128,128 ,255
25050 DATA 128 128 128 128 128,128,128 ,255
25060 DATA 255,128 128,128 128,128,128 128
25070 DATA 1,1 1 1,1 1 1,255
25080 DATA 255 1 1 1,1,1 1 1
25090 DATA 129,129 129 129 129 129 129 129
25100 DATA 255 0 0,0 0 0 255
25110 DATA 128,128,128 128,128,128,128 ,128
25120 DATA 1,1 1,1 1 1,1 1
25130 DATA 255 0 0 0 0 0,0 0 0
25140 DATA 0,0 0 0 0 0,0 0,255
25150 DATA 0 63,67 253,253,285,254,252
25160 DATA 0 0 0,56,56,124,120,126,60
25170 DATA 0,0,24,24,24,24,255,255,0
25180 DATA 0,24,88,126,128,60,24,0
25190 DATA 255 256 255 255,255,255,255 ,255
25999 REM ***MAZE DATA***
26000 DATA 0,0 56 74 74 16,89,46,56,58 ,62,36 54,0,0 0,0 0,0
26010 DATA 0,0,20 24,24,0,60,52,108,92 ,124 124,36,108 0 0,0,0,0
26020 DATA 0,0,24 16 24,60,126,126 126 ,126,60,60,36,108 0 0,0 0,0,0
26030 DATA 0 0,0,24 24 0 60,128,110,126, 126 60,50 30 50,0,0 0 0,0,0
26040 DATA 0,0 0,64,0,0,4,16,0,4,0,0,0 0 0,0,0,0,0,0
26050 DATA 0,0 0 2,0,16 32,0,16,32,0,0 ,0 0,0,0,0,0,0
26060 DATA 0,0 0,0,0,0,0,0,0,0,0,0,0,0 ,0 0,0 0 0
26070 DATA 0 0,0,0,0,24,24,0,0,0,0 0,0,0 ,0 0,0 0 0,0 0
27000 DATA 104,104,133,215,104,133,214 ,104,133 217,104 133,216,104,133,210
27010 DATA 104,170,160,0 177,214,145,2 10 200 200 4,210,215,210,217,207
27020 DATA 206,242,198,210,16,238,96
28000 DATA 104,104,133,207,104 133,206 ,104,104 133 216 169,0,133,204,169
28010 DATA 224,133,205,167,1,198 0,172 ,204,145 200,200,200,202,236,205
28020 DATA 236,207,237,228,112,200,140 96
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	10014	12	2762	14	3946
15	9010	20	1070	50	17870
55	29356	60	18259	65	26259
70	10243	72	12103	75	13468
80	17004	82	12108	85	13478
90	13482	99	7071	100	29305
110	15461	120	10506	125	4704
130	14213	140	2606	150	8032
200	1600	199	14787	200	11948
210	3913	220	1841	230	3866
250	21074	260	8202	290	1458
299	6462	300	1392	310	2546
320	1345	330	2811	340	7636
350	2702	355	5910	360	1571
399	10122	400	1182	410	2550
420	1145	430	4038	435	4018
440	3081	450	2420	460	6229
470	1600	499	12690	500	3932
510	17237	540	8070	550	10545
560	2019	570	6135	575	2221
580	1490	590	11371	595	8074
599	13000	600	8122	610	3666
620	4064	630	1642	640	3746
650	4292	652	4399	655	1641
660	3712	670	4357	906	3570
635	10355	690	1430	697	10457
700	17955	710	8552	750	8107
760	2019	770	6135	775	2221
780	14701	840	1490	897	12005
900	4170	910	3892	920	7191
930	1490	999	9590	1000	1956
1010	4068	1020	20126	1030	7876
1040	2076	1050	5900	1066	11211
1070	8091	1080	6335	1090	5724
1099	9594	1100	1256	1110	4692
1120	6424	1140	5400	1150	5988
1160	8978	1199	9135	1190	3722
1299	9590	1200	1956	1210	4698
1220	11386	1230	5140	1240	3878
1250	6986	1260	11176	1270	2778
1280	6315	1290	3724	1299	9590
1300	2340	1310	4703	1320	8524
1330	3308	1340	1870	1350	5908
1360	6305	1370	11027	1380	6241
1390	3724	1400	1640	1500	1851
1509	1954	1700	1040	1800	1051
1900	1954	1999	7412	2000	5307
2010	8110	2019	2340	2020	1866
2030	5400	2110	8023	2115	2248
2120	1892	2200	5401	2210	5197
2212	7391	2214	8056	2215	2340
2216	6090	2220	1862	2300	5422
2310	1821	2312	7183	2314	5838
2315	2140	2316	6094	2400	2561
2410	4830	2020	4010	2435	1296
2440	9621	2450	11011	2480	1345
2490	1699	2500	8089	2501	9504
2502	8054	2503	6219	2504	6903
2505	1030	2506	9352	2511	6045
2512	6375	2513	6089	2514	8307
2515	1430	2520	6529	2521	6967
2522	6000	2523	8037	2524	6010
2525	1490	2530	6014	2531	8321
2532	6977	2533	6007	2534	8075
2535	1453	2540	6398	2541	8910
2542	6917	2543	6929	2544	6912
2545	1430	2550	6921	2551	6926
2552	6925	2553	6028	2554	6920
2555	1490	2560	6032	2561	6053
2562	6315	2563	6375	2564	8313
2565	1490	2570	6070	2571	8014
2572	6931	2573	6030	2574	6036
2575	1425	2530	6063	2501	6004
2502	6923	2503	6913	2504	8311
2505	1470	2590	6007	2591	6900
2592	6935	2597	6090	2534	8015
2595	1450	2600	6516	2601	6934
2502	6923	2603	6391	2604	6913
2605	1490	2610	6940	2611	8941
2612	7044	2613	6969	2614	6076
2615	1470	2620	6548	2621	6943
2622	7046	2623	6969	2624	6076
2625	1490	2700	9902	2710	6724
2720	7206	2730	1890	2999	3627
3000	6287	3005	7477	3007	2118
3020	9455	3010	2161	3040	10255
3050	13081	3060	10559	3076	8221
3100	7140	3110	1055	19999	7525
20000	7016	20010	25013	20020	8356
20030	5042	20040	14719	20050	10196
20060	16711	20070	11869	20080	10711
20090	11892	20100	7603	20105	11174
20110	10641	20115	24561	20120	11511
20130	7697	20200	5964	20126	21577
20730	20134	20240	1206	20250	10960
21000	1056	21005	18737	21010	20571
21020	9508	21030	4181	21040	25747
21050	27017	21055	4062	21060	2177
21070	4362	21080	7303	21090	28705
21095	28756	22000	4263	22010	3014
22020	5811	22030	2351	22040	1689
22050	8220	24990	10779	24995	10004
25000	3174	25010	5857	25020	5657
25030	3986	25040	5634	25050	5635
25060	5832	25070	3412	25080	1428
25090	5657	25100	5398	25110	5835
25120	3186	25130	1487	25140	3391
25150	5833	25160	4089	25170	8209
25180	4374	25190	5642	25999	7848
26000	8412	26010	8759	26020	9161
26030	8544	26040	6038	26050	2185
26060	8556	26070	9758	27000	10202
27010	9741	27020	4777	28000	9934
28010	5795	28020	5476		

Once-Over

Back-up your discs quickly and easily with RICHARD VANNER's single pass disc duplicator

HAVE you ever accidentally wiped out a couple of days work simply because you forgot to back-up your main work disc? Most programmers have – probably it seemed just too much bother to go through all that tedious disc swapping involved in a duplicate disc operation.

If you've ever had this problem Once-Over Program I is the solution you have been looking for

It is a disc back-up program that can copy an entire single density disc in just one pass

To do this you must have a 130XE – or an upgraded 800XL – because the program uses the extra 64k of banked memory to store part of the 92k of data from the disc It will *not* allow you to duplicate commercial copy-protected discs

Once Over is designed to be easy to use and very fast The options available to you are displayed on one main menu screen

Option 1 will read a single density disc from the source drive into the Once Over buffer You can monitor the progress of the load by watching the fuel-gauge at the bottom of the screen

Option 2 saves out all the data in the buffer on to the disc in the destination drive This operation may be carried out as many times as you like if you want to make multiple copies

Option 3 toggles write verify on and off If it is selected the data will be checked back after it has been written to the destination disc This has the side effect of slowing down the duplication

Option 4 toggles the format disc function The destination disc will be formatted before any data is written to it

Option 5 changes the source disc drive number This option will cycle through drives one to four

Option 6 cycles the destination disc drive number from one to four

Pressing System Reset will allow you to exit from a load or save operation The contents of the buffer will remain intact

Type in the Basic listing and save it then place a formatted disc in drive 1 and run the program If an error occurs then the data is not correct and you should use Get It Right! to track the problem down

Once the data is correct it will create a nine sector disc file called ONCEOVER OBJ This is the Once-Over machine code file To use it simply go to the DOS menu and use the binary load option – L

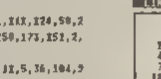
This file is completely self contained and may be copied on to any of your work discs You could even rename it as AUTORUN SYS and have it run automatically on power up

For machine code programmers I have also provided the full assembly listing – Program II – which will create exactly the same object file as the Basic version ■

Program I: Basic listing

```
1 REM ###    ONCE  OVER     ###
2 REM ### DISKET FILE CREATOR ###
3 REM ### (C) 1986 ATARI USER ###
4 REM ### BY  RICHARD VANNER  ###
5 POKE 752,1 ? #41    Please wait  C
hecking DATA "
10 TRAP 100:DIM T$(1),A$(1),B$(1),C$(1),D$(1),E$(1),F$(1),G$(1),H$(1),I$(1),J$(1),K$(1),L$(1),M$(1),N$(1),O$(1),P$(1),Q$(1),R$(1),S$(1),T$(1),U$(1),V$(1),W$(1),X$(1),Y$(1),Z$(1)
20 READ A$:IF A$="EOF" THEN 40
30 READ B
35 TRAP 40000:RESTORE 1000
40 IF T$()"S" THEN GOTO 100
50 OPEN #1,8,0,"D:ONCEOVER.OBJ"
60 FOR A=1 TO 1059:READ DA
70 PUT #1,DA
80 NEXT A
90 ? "D:ONCEOVER OBJ' file create
d !" END
100 ? "644          ERROR - Data incorrec
t!" END
1000 DATA 255,255,224,2,125,2,102,33,0
,32,251,32,112,112 112 71 58,32,7,7
1010 DATA 112,0,0 5,0,5 0,5,0,0 0,5,11
2,2,32,2,2,0 2,32
1020 DATA 2,65,0 32 169,0,141,46,2,169
,32 141,47 2,169,10 141,197,2,169
1030 DATA 58,141-196,2,169,196 141,198
,2,96,47,0,45,0 35,0,37,0,0,13
1040 DATA 13,0,0,47,0,64,0,27,0,66,0,0
,0,0 0 0,0-0,0,162
1050 DATA 105,0,0,0,0,0,0,0,0,0,0,114,
105,99,104,97,114,100,0,0
1060 DATA 0 0,120,27,118,110,101,124,0
,0,145,0,44,47,32,35,0,34,53 16
1070 DATA 38,47,60,0,0,0,0,0,0,0,0,140,0
,51,33 54 37 0,24,61,30
1080 DATA 36,37,50,0,0,0,0,0,0,0,0,147-0
,55,00,41 52 47,0,54,37
1090 DATA 50,01 39,57,0,0,0,100,165,17
9,149,0 33,47,50 46,33,52,0,36
1100 DATA 41,51,43,0,0,0,0,0,165,169,179
,149,0-61,47,53,50,35,37,0,25
1110 DATA 41,51 43,0 0,0,0,0 0,145 150
,0,15,37,51,52,41,46 33,52
1120 DATA 41,47 46 0,36 41,51,43,0,145
,165,173,176,100 135,142,152,120,120,1
20
1130 DATA 120 120,120,120,252,32,247,1
3 120,170 103,163,171,120,162-101,166,
166,105,170
1140 DATA 120 170,120,120 120 120,120,
120,252,160,101,172 172 142,0,0,0,0,0,
0
1150 DATA 0,0 0,12 0,0,0 0,0,0,0,0,0,1
0 0 0,0,0 0-0
1160 DATA 0,0 0,15,0 0,0 0,0 0,0,0,0,2
0 17,10,19 20 21,22
1170 DATA 23,24,25,10,17,10,19,20,21,2
2,23,24,25 10,17,10,19,20,21,22
1180 DATA 23,24,25,10,17,10,19,20,21,2
2,23 24-25,15,0,0,0,0,0,0
1190 DATA 0 0,0 0,0,0,0,0,0,0,0,0,0,0,
0,0,0 0,0,0
1200 DATA 0,0,0-0,0,0 0,0,0 0,0 0,0,0
128,175,230,227,229,120 "
1210 DATA 175,140,229,202,120,128,226,
245-128,120,178,233 227,232,225,242,22
0 128 102,225
1220 DATA 238,210 229,242,128,120 179,
229-240,244,128 130,152,150,169 0,141,
80 2,169
1230 DATA 2,133,9,169 102,133 2 169,33
133-3,32,22,32,32,96 25,201,81,240
1240 DATA 29,201 30-240,31,201,26 240,
33 201 24-208,3,76,41,24,201 29-208,3
1250 DATA 76 98 14 201,27,208,213 76 1
14,34,32,130,34,76,202,32,32 155,34,76
```

```
1260 DA1A 248,33 243,36,202,33,173,77,
35,201,80,240 21 169,80,141,77,35,162,
0
1270 DA1E 169,74,35,157,175,32,221,224
,1,208,245,76 201,33,169,87,141,77,35,
162
1280 DA1A 0,189,73 35,157,175,32,221 2
24 1 208 245 76,201,33,173,78,35,208,2
1
1290 DA1E 169,1 141,76,35,161,0,189,71
,35 157,175,32,221,224 3,208,245,76,20
2
1300 DA1A 33,169 0,141 78,35,162,0,189
,74,36,157 175,32,221,224,1,208,245,76
1310 DA1A 202,33 208,73 35,173,79,35,2
01,5,208,5 169,1,141,79,35,24,190,144
1320 DA1A 141,117,32,76,202 33,130,56,
25,173,80,25,201,5,208,5,169,1,141,59
1330 DA1E 35,24,105,144,141,127,35,76,
202,32,17,35,36,109,52 141,83,35,173 7
7
1340 DA1E 35 141,150,35,76,202,34 32,3
5,36,173,70,35,240 24,169,32 141,1,2
1350 DA1E 169,47,141,4,1,165,16,141,5,
3,173,90 35,141,1,2,32,83,228,173
1360 DA1A 80,25,141,156,35,173,77,35,1
41,81 35,76,192 34,107,1,141,86,35,107
1370 DA1E 0,141,82,35,141,81,35,141,87
 35 141,2,35 174,2,35,189,232,24,32
1380 DA1A 3 35 228,2,35,172,2,35 201,2
,208 237,169,1,141,84,244,34,225,15
1390 DA1A 38,169,0,141,85,28,76,25,35,
243,227,235,221,229,0,141,1,211,32,127
1400 DA1A 35,173,82,35 141,2,2,32,179,
35,32,161,35,32,206,35,230,54,35,173
1410 DA1A 84,35,201,189,200,231,96 169
,0,141,80,35,105,170,141,85,35,173,83,
35
1420 DA1E 141,2 3,21,179,35,32,161,25,
32,200,35,230 84,35,173,84,35,201,81
1430 DA1A 208,231,96,105,165,173,0,174
,175 87,1 1,1 0,0,0,0,0,0,0
1440 DA1A 0,0,169,255,141,253,2,173,11
,212,208,251,165,20,141,10,212,141,23,
208
1450 DA1A 24,105,1,174,11,236,224,50,2
00 240,173,197,2,101,23,150,173,251,2,
201
1460 DA1A 256,240,229,72,32,5,36,104,9
0,189,1,141,84,35,169,0,141,85,35,141
1470 DA1A 80,35,169,84,141,89,35,153,2
,141,1,3,76 173,80,35,24,105,120,141
1480 DA1A 80,35,173,89,35,105,0,141 89
,35,35,173,86,35,141,10,2,173,87,35
1490 DA1E 141,11,2,173,50,35,141,4,3,1
73,83,35,141,5,3,76,82,228,230,86
1500 DA1A 35,173 86,35,208,3,238 87,35
,238,86,35,173,81,35,201,10,206,19,174
1510 DA1E 87 35,189,107,33,73 128,157,
107 33 169,0,240,35,46,36,141,81,35,32
0
1520 DA1A 82,35,96,165,20,141,4,36,165
,20,205,4,36,240,249,96,0,169,0,141
1530 DA1E 0,210 169,7,141,15,210,169,4
0,141,0,210,162,15,139,9,160 141,1,210
1540 DA1A 32,247,35,254,16,244,96,169,
0,170,157,107,33,232,114,40,200,248,96
```



LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	4520	1	5203	3	5049
4	5451	5	10205	10	5465
20	4107	30	1273	35	4174
40	4714	50	6197	60	4501
70	1085	80	1329	90	8271
100	10315	1000	10210	1010	7493
1020	10035	1030	9655	1040	7818
1050	8674	1060	9765	1070	8315
1080	8352	1090	7819	1100	9417
1110	9081	1120	11120	1130	17405
1140	10082	1150	6782	1160	7693
1170	9750	1180	9671	1190	8512
1200	8315	1210	12767	1220	12170
1230	10328	1240	10560	1250	10703
1260	10965	1270	11458	1280	10974
1290	10773	1300	10775	1310	10857
1320	10678	1330	10574	1340	10614
1350	10007	1360	10022	1370	10108
1380	10160	1390	10697	1400	10590
1410	11268	1420	11693	1430	5878
1440	11256	1450	11226	1460	10747
1470	10716	1480	10488	1490	10058
1500	10833	1510	10784	1520	10346
1530	10667	1540	10778		

Program II: Assembler listing

```
0100 ;          90CE   OVER
0110 ;          -  ------ ----
0120 ;
0130 ;  Single density disk copier
0140 ;
0150 ,  ATARI USER,  December 1986
0160 ;
0170 ,       By  Richard Wanner
0180 ,
0190      *=  $02E0   ;RUN ADDRESS
0200        9090 $1801
0210 ;
0220 ;OS EQUATES
0230 ;
0240 $5810DV = $E454
0250 PUTSECOM = $57
0260 PSECCOM = $50
0270 GETSECOM = $53
0280 FORMAT = $21
0290 DEVICE = $0301
0300 COMMAND = $0302
0310 STATS = $0303
0320 BUFLO = $0304
0330 BUFHI = $0305
0340 TIMLO = $0306
0350 TIMHI = $0307
0360 ;
0370 ,DISPLAY LIST EQUATES
0380 ;
0390 BLANK1 = 8
0400 BLANK2 = $70
0410 BLANK3 = $70
0420 SAV =   $0E
0430 ADR =   $06
0440 SEC =   $07
0450 LMS =   $40
0460 JVB =   $41
0470 SDLSTL = $0230
0480 ;
0490 ,
0500      *=  $5000
0510 ;
0520 ,Display List
0530 ;
0540 DL35E  BYTE BLANK8,BLANK8,BLANK8
0550        BYTE GR2+LMS
0560        WORD SCREEN
0570        BYTE GR1,GR2
0580        .BYTE BLANK1,GR1
0590        BYTE BLANK1,GR1
0600        BYTE BLANK1,GR1
0610        BYTE BLANK1,GR1
0620        BYTE BLANK1,GR1
0630        BYTE BLANK8,GR8,BLANK3,GR8,GR8
0640        BYTE BLANK1,GR8,SLOOP3,GR8
0650        BYTE JVB
0660        ,WORD DL35I
0670 ;
0680 ;Set up Display List
0690 ;
0700 SETDL LDA #DL35E/256
0710       STA SDLSTL
0720       LDA #DL35E/256
0730       STA SDLSTL+1
0740       LDA #$00
0750       STA 703
0760       LDA #$3A
0770       STA 704
0780       LDA #$C4
0790       STA 710
0800       RTS
0810 ,
0820 ,SCREEN STARTS HERE
0830 ;
0840 SCREEN
0850       .BYTE "D R I V E   -  D U P E R"
0860       .BYTE "                "
0870       .BYTE " Richard   Wanner  "
0880       .BYTE "  LOAD BUFFER       "
0890       .BYTE "  SAVE BUFFER       "
0900 DOS =   *+17
0910       .BYTE "  WRITE VERIFY   OFF"
0920 FS      *+17
0930       .BYTE "  FORMAT DISK       "
0940 SCS     *+19
0950       .BYTE "  SOURCE DISK       "
0960 DES     *+19
0970       .BYTE "  DESTINATION DISK  "
0980       .BYTE "EMPTY        TRACK BUFF
ER          FULL"
0990       .BYTE "                1         1
          4"
1000       .BYTE "1234567890111456789011234
5678901234567890"
1010 SCREEND
1020       .BYTE "
```

```
1030      .BYTE "DISK UTIL  by  Ken Reed
DATE:  DEC 84"
1040 ;
1050 ; MAIN PROGRAM CODE
1060 ;
1070 $1A01
1080      LDA #0        ;Set up System
1090      STA $0244     ;Reset
1100      LDA #7        ;Vector
1110      STA 9
1120      LDA #$7007+255
1130      STA 2
1140      LDA #$7007+250
1150      STA 3
1160      JSR SETUP
1170 ;Wait for a key to be pressed
1180 START0 JSR KEY
1190      CMP #31       ,1
1200      BCC LOAD
1210      CMP #33       ;2
1220      BEQ SAVE
1230      CMP #35       ,3
1240      BCC WRITE
1250      CMP #34       ,4
1260      BNE OPTION1
1270      JMP FORMAT0
1280 OPTION1 CMP #37 ;5
1290      BNE OPTION2
1300      JMP SOURCE
1310 OPTION2 CMP #37 ;6
1320      BNE START0  ;Key not valid
1330      JMP DEST
1340 LOAD JSR 1400BUFFER ;Load buffer
1350      JMP START0  ;Next option
1360 SAVE JSR SAVEBUFFER ;Save buffer
1370      JMP START0  ,Next option
1380 ;
1390 ;Write with verify toggle
1400 WRITE LDA #0
1410      ZAP #PSECT00 ,Verify on?
1420      BEQ WRITE2  ;No
1430      LDA #PSECT08 ,Yes turn off
1440      STA #0
1450      LDX #0        ;Print No to screen
1460 WRITE1 LDA #0,X
1470      STA #05,X
1480      INX
1490      CPX #3
1500      BNE #PRINT1
1510      JMP START0
1520 WRITE2 LDA #PVSECT00 ,Set Verify on
1530      STA #0
1540      LDX #0        ;Print Yes To screen
1550 #PRINT1 LDA YES,X
1560      STA #05,X
1570      INX
1580      CPX #3
1590      BNE #PRINT1
1600      JMP START0
1610 ;
1620 ,Format destination toggle
1630 ;
1640 FORMAT0 LDA FMT
1650      BNE #FORM01
1660      LDA #1
1670      STA FMT
1680      LDA #0
1690 FORMAT1 LDA YES,X
1700      STA FS,X
1710      INX
1720      CPX #3
1730      BNE FORMAT2
1740      JMP START0
1750 #FORM01 LDA #0
1760      STA FMT
1770      LDX #0
1780 #FORM02 LDA #0,X
1790      STA FS,X
1800      INX
1810      CPX #3
1820      BNE #FORM02
1830      JMP START0
1840 ;
1850 ;Select Source disk option
1860 ;
1870 SOURCE INC SC
1880      LDA SC
1890      CMP #5
1900      BNE SOURCE1
1910      LDA #1
1920      STA SC
1930 SOURCE1 CLC
1940      ADC #$30
1950      STA SC5
1960      JMP START0
1970 ;
1980 ;Select Destination disk option.
1990 ;
2000 DEST INC DE
2010      LDA DE
2020      CMP #5
2030      BNE DEST
2040      LDA #1
2050      STA DE
2060 DEST2 CLC
2070      ADC #$30
2080      STA DE5
2090      JMP START0
2100 ;
2110 ,Load Buffer from source disk
2120 ;
2130 LOAD#BUFFER JSR CLEAR#BUFF
2140      LDA #SSEC100
2150      STA COMMAND
2160      LDA SC
2170      STA DISKNUM
2180      JMP START1
2190 ;
2200 ;Save Buffer to destination disk
2210 ;
2220 SAVEBUFFER JSR CLEAR#BUFF
2230      LDA FMT
2240      BEQ SAVEBUFFER2
2250      LDA #$21
2260      STA #COMMAND
2270      LDA #0:100+255
2280      STA #BUFLO
2290      LDA #0:128/250
2300      STA #BUFHI
2310      LDA DE
2320      STA #DEVICE
2330      JSR #SEIRV
2340 SAVEBUFFER2 LDA DE
2350      STA #ISKNUM
2360      LDA #0
2370      STA COMMAND
2380      JMP START11
2390 ;
2400 ,Set disk params
2410 ;
2420 START1 LDA #1
2430      STA SECTOR
2440      LDA #0
2450      STA #OSZTIDR
2460      STA COUNTER
2470      STA SEC100+1
2480      STA #SELECT
2490 ;Select Memory banks
2500 START2 LDX #SELECT
2510      LDA #00#S,X
2520      JSR GBLOCK
2530      INC #SELECT
2540      LDA #SELECT
2550      CMP #5
2560      BNE START2
2570      LDA #1
2580      STA SCOUNT
2590      LDA #0
2600      STA SCOUNT+1
2610 ;Last 10K To be loaded
2620      JMP GLOOP
2630 ;
2640 00#S  .BYTE 242,227,215,211,239
2650 #SELECT .BYTE 0
2660 ;
2670 ,Load/Save 10K block $4000-$7FFF
2680 ;
2690 GBLOCK STA $0301
2700      JSR #RIVSIS
2710 GBLOCK1
2720      LDA COMMAND
2730      STA #COMD0
2740      JSR SETUP1
2750      JSR #BUFF1
2760      JSR SPLUS1
2770      INC SCOUNT
2780      LDA SCOUNT
2790      CMP #121
2800      BNE GBLOCK2
2810      RTS
2820 ,
2830 ;Load/Save 10K block $8000-$97FF
2840 ;
2850 GLOOP LDA #0
2860      STA BUFFER
2870      LDA #$80
2880      STA BUFFER+1
2890 GLOOP1 LDX COMMAND
2900      STA #COMMD
2910      JSR SETUP1
2920      JSR #BUFF1
2930      JSR SPLUS1
2940      INC SCOUNT
2950      LDA SCOUNT
2960      CMP #81
2970      BNE GLOOP2
```

This is one of hundreds of programs now available FREE for downloading on MicroLink

```
2960       RTS
2990 ;
3000 YES   .SBYTE "YES"
3010 NO    .SBYTE " NO"
3020 OK    .BYTE PUSECTOR
3030 FMT   .BYTE 1
3040 SC    .BYTE 1
3050 DE    .BYTE 1
3060 COUNTIO  .BYTE 0
3070 POSITION  .BYTE 0
3080 COMMAND  .BYTE 0
3090 SCOUNT  .WORD 0
3100 SECTOR  .WORD 0
3110 BUFFER .WORD 0
3120 ;
3130 ;GET A KEY
3140 ;
3150 KEY LDA #255
3160       STA 764
3170 KEY2 LDA $D01F
3180       BNE KEY2
3190       LDA 20
3200 KEY3 STA $D40A
3210       STA $D01F
3220       CLC
3230       ADC #8
3240       LDX $D40B
3250       CPX #50
3260       BNE KEY3
3270       LDA 764
3280       STA $D01F
3290       LDA 764
3300       CMP #255
3310       BEQ KEY2
3320       PHA
3330       JSR BELL
3340       PLA
3350       RTS
3360 INITDISK LDA #1
3370       STA SCOUNT
3380       LDA #0
3390       STA SCOUNT+1
3400       STA BUFFER
3410       LDA #$40
3420       STA BUFFER+1
3430 DISKNUM = *+1
3440       LDA #2
3450       STA DEVICE
3460       RTS
3470 BUFF128 LDA BUFFER
3480       CLC
3490       ADC #128
3500       STA BUFFER
3510       LDA BUFFER+1
3520       ADC #0
3530       STA BUFFER+1
3540       RTS
3550 SETDISK LDA SECTOR
3560       STA DAUX1
3570       LDA SECTOR+1
3580       STA DAUX2
3590       LDA BUFFER
3600       STA DBUFLO
3610       LDA BUFFER+1
3620       STA DBUFHI
3630       JMP DSKINV
3640 SPLUS1 INC SECTOR
3650       LDA SECTOR
3660       BNE SPLUS2
3670       INC SECTOR+1
3680 SPLUS2
3690       INC COUNTIO
3700       LDA COUNTIO
3710       CMP #10
3720       BNE SPLUS4
3730       LDX POSITION
3740       LDA SCREEN,X
3750       EOR #$80
3760       STA SCREEN,X
3770       LDA #0
3780       STA COUNTIO
3790       INC POSITION
3800 SPLUS4 RTS
3810 JIFFY LDA 20
3820       STA JIFFY1
3830 JIFFY2 LDA 20
3840       CMP JIFFY1
3850       BEQ JIFFY2
3860       RTS
3870 JIFFY1  .BYTE 0
3880 BELL LDX #8
3890       STA $D200
3900       LDA #3
3910       STA $D20F
3920       LDA #40
3930       STA $D208
3940       LDX #15
3950 BELL2 TXA
3960       ORA #$A0
3970       STA $D201
3980       JSR JIFFY
3990       DEX
4000       BPL BELL2
4010       RTS
4020 CLEARBUFF LDA #0
4030       TAX
4040 CBUFF2 STA SCREEN,X
4050       INX
4060       CPX #40
4070       BNE CBUFF2
4080       RTS
4090 DATA = *+128
```


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JUMBLED DATA STORAGE STRINGS

I AM having problems with a data storage program in Basic

```
10 DIM A$(100),B$(100)
20 FOR N=1 TO 5: INPUT A$:
B$(N)=A$: NEXT N
30 FOR N=1 TO 5: PRINT
B$(N): NEXT N
```

is meant to print out the five strings previously entered but just jumbles them up

In saving and loading information, variable ram holds some numbers. After opening channel 3 to the cassette and typing

```
10 FOR N=1 TO 20:
PUT #3;NUM(N): NEXT N:
PRINT #3;CHR$(155)
```

then loading it with

```
10 GET #3,C
20 IF C<>155 THEN
NUM(Z)=C: Z=Z+1: GOTO 10
```

it does not seem to work. Please could you help me out?
– **Andrew Shuttleworth, Garstang, Lancs**

● The answer to your first query is easy – you are trying to use *B$(N)* as a string array which is not what it is at all.

B$(N) refers to a portion of a single string B$ beginning with the Nth character.

Atari Basic does not have string arrays as such and DIM *B$(100)* simply reserves 100 characters as the maximum length for *B$*.

To get around the problem you must set up a long string say 2 000 characters and use substrings to represent the elements of your array.

See our reply to David Stockton's letter for the December 1985 issue for an example of how to do this.

In your second query the only thing which would seem to be at fault – assuming you have remembered to DIM the array and OPEN it the right way – is the fact that you will get an PRINT CHR$(155) at the end of the first line.

This will simply print a carriage return on the screen and should be replaced with a PRINT #3;CHR$(155) or simpler still with PUT#3,155.

Other than this your program should work. Let us know how you get on.

Aligning tape heads

ARE there any tape head adjustment packages for the Atari as there are for most other makes of computer?

If not would it be possible for you to give me some tips on adjusting the tape head?
Peter Goulden, Lincoln

● There aren't any commercial tape alignment kits for the Atari that we know of. But it is not too hard to do a reasonable job yourself.

Firstly on some recorders you will need to remove the casing to get at the alignment screw. This is situated on the assembly that holds the play head and allows you to move the head up and down slightly. This is known as the azimuth adjustment screw.

Put a music cassette in the recorder and press Play. If you have a second one you will be able to tell the right hand setting by ear. If not you will get even better results assuming your tapes and heads are properly aligned.

If you type POKE 54018,52 and start the tape running and adjust the screw until the best sound comes out of the TV loudspeaker. Be very careful not to touch the head itself with the screwdriver or you will have to begin again.

The head should be cleaned and demagnetised before and after each alignment.

If you are not confident doing the azimuth alignment by ear then you should be able to do it using a test tape and a multimeter.

Window on the 1020

AS usual I find the instruction manuals provided by Atari are almost without exception useless. The manual for the 1020 Printer Plotter is no exception.

It was with great pleasure therefore that I heard about the Victagraph Plot Window as this piece of equipment has a very good section on the 1020 and I feel that Atari might do well to copy it. The Plot Window itself is also very good.

As I understand it these items are now out of production but the manufacturers – Victagraphics 7 Speechly Drive Rugeley Staffs WS15 [illegible] have a number in stock at approximately £8 per set.
Reymond Price, Canton, Cardiff

TV time for 800XL

I HAVE recently bought an 800XL computer with a cassette recorder and games.

There are approximately 1000 people in my school but I know of only one who has owned an Atari machine before a 400.

The Atari computer has good capabilities and impressive sound and graphics, especially when compared with other machines. So why is it so comparatively rare?

Incidentally I have just read in the July issue about BBC TV programmes neglecting other makes of micros.

This is not strictly true. On Tuesday June 24 the BBC programme Think of a Number was on it an 800XL machine with the game Rescue on Fractalus running.

I find the Atari to be a prime example of a home computer and shall no doubt stay with Atari for years to come. ■
Paterson, Pentelend, Newcastle-upon-Tyne

Missing eight squares

I HAVE just bought an Atari 800XL with which I am pleased but I have a slight problem.

When I use the memory test included in the brochure instead of 48 squares appearing on the screen there are only 40. Is this normal or is

→

Drawing the line...

I OWN an Atari 800XL. When I use the DRAWTO statement it draws a character key (Control+comma). Could you tell me what I can do to draw lines instead of hearts? – **Edwin Dickinson, Middlesbrough, Cleveland**

● It sounds as though you are trying to use DRAWTO with a text screen. As the computer can only put characters on a text screen it does its best to understand what you mean and draws a line of characters.

The heart shape is that of character number zero and if you use a different COLOR number you'll get different characters.

However to draw real lines you will need to use a different screen mode. Try typing GRAPHICS 8 then COLOR 1 and then doing your PLOTs and DRAWTOs.

something wrong with the computer? – **D Buckingham, Walsall, West Midlands**

● The number of letters we get on this one is incredible! We thought that by now everyone had got it sorted out but as new users come along they all run straight into the same headaches we all confronted when we started out.

The answer is that you will get 40 squares if you go to the Self Test from Basic by typing BYE. This is because 8k of memory is still taken up by the Basic language itself.

If you hold down the Option key as you switch on Basic will be disabled and you will be able to get the full 48 squares.

Space Maze messages

I HAVE two queries. First of all I tried to type in your program Space Maze from Atari User's July issue and line 170 of the program kept erroring. I have tried many times to correct this line but nothing works. Is there a misprint somewhere in the line?

I typed in the program from the August issue, Frank the Fruit Fiend, then listed it and typed in Save remembering to move the tape 10 counts, waited for the two beeps, pressed Play, Record and then Returned it.

When the ready sign came up I stopped the cassette and rewound it. To load it I typed in CLOAD, followed by Return, waited for the beep, pressed Play and Returned it.

The tape began to load but after a few counts the tape errored and has done so every time I have tried to load it. The error number 138 keeps appearing on the screen.

I have tried saving short programs to my cassette and then loading back into my computer without any success at all.

Please can you tell me – am I doing something wrong or is my computer not working properly? **D Percival, Elswick, Newcastle**

● We've checked line 170 of Space Maze and there is no problem with it – indeed we can't quite see how an error could be generated at run time either.

Possibly your problem may revolve around the old Rev B Basic line entry bug or a fault in your machine.

Try to let us know more details. Line 170 keeps erroring doesn't give us much to go on. For example when does it error, what error number does it give and also what are the contents of the variables afterwards if the errors at run time?

As to your second query. Error 138 means that the computer can't find the program it was looking for.

If you wound the tape forward to 10 on the counter when you recorded it did you remember to do the same

ATARI USER Mailbag

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

The address to write to is:

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

YOUR HINTS AND TIPS

NINJA

IN the October issue of Atari User I read a review of the excellent Ninja by Mastertronic. The reviewer, Bob Chappell, couldn't seem to get up a level. Don't worry Bob, that was what I thought to start with.

My brother found it out by accident. When you get all the idols on the first level go to the Ship's entrance, look at the top of the screen for a black hole.

Move Ninja under this and push the joystick up. Ninja will leap up to the next level.

This method applies to accessing all other levels at any time. You can also go down holes in the floor.

When you have six idols, keep going up and to the right.

When you reach a room called Grey Wall you should see a passage upwards. If the last idol is in Grey Wall, kill off the foes, get the idol, exit the room to the left and re-enter it again. The hole at the top will now appear.

Next move up the passage. When you enter the room you will see five foes and the room is coloured blue.

First kill off the foes – easier said than done, though they do attack in twos – then grab the last idol and fall down the hole. Keep going down until you reach the first level. The enemies have reappeared.

Fight them off and keep going until you reach your Starting Locations (Tork in the Sea). You have now completed Ninja – **Duncan Husband, Harrington, Worcs**

MERCENARY ESCAPE

WITH reference to your excellent review on Mercenary Escape from Terg I would like to suggest a means of retrieving a craft without losing all the objects you are carrying at the time.

Press L to land. If you are already in a craft. Drop all the objects you are carrying by pressing D.

Press the control key and Q to retrieve your ship and L to get out of your new ship.

Press T to take your objects back one by one. Board your ship again and you're away.

Not bad, eh?

Also to reach 9900 units per time part use the > key after pressing 0 while in your craft. Keep pressing this key until you reach the desired speed.

Different crafts can obtain different speeds – the Dominion Dart can achieve 9900 when it is airborne – **Michael O'Connor, Dublin**

MINDSHADOW

IN Mindshadow from Activision in order to quit the island, enter N – ENTER HUT – GET STRAW – S – E – GET STEEL – E – GET VINE – W – W – S – E – DROP ALL – GET VINE – TIE VINE ON ROCK – DOWN – W – DIG – GET MAP – READ MAP – GET ROCK – E – UP – GET ALL – W – N – N – N – E – N – E – E – S – S – E – GET BOTTLE – W – N – N – W – W – S – W – S – S – S – RUB STEEL WITH ROCK – GIVE BOTTLE.

However I now feel like a prisoner on the boat. I know that I have to cut the chain on the winch in order to anchor the ship.

Someone told me to go to the kitchen and get the meat cleaver to do that job. But the crew won't let me pass to the south gate. Please can anyone help me to escape? – **Alain Gayster, Paris**

ONE MAN AND HIS DROID

I BOUGHT Mastertronic's One Man and his Droid some time ago, but I have a problem.

If all the droids are captured in the correct order as well as points a time bonus is obtained.

At the start of the game the

before trying to load it back in again?

If you can t get the CSAVEd vers on back in at all why not try the version you LISTed for use with the checksum?

If the checksum managed to read it correctly you can re-load it with ENTER C and then you can try CSAVE ing it again

If you still can t get anyth ng to CSAVE properly the prob lem may be with your equipment

Take both the computer and the recorder back to your dealer for testing as the fault could be with e ther – though it is more likely to be the recorder

Translator disc

I WISH to buy a transdisc Could you please advise me where to obtain one? – **Alastair Oliphant, Newton Mearns, Glasgow**

● You can purchase a trans for disc, which is what we think you mean from any Atari mail order company Typically they will just charge you just for a blank disc and postage plus a nom nal copying fee

Elusive sprites

I HAVE recently acquired an Atari 800XL and to supplement the rather flimsy manuals I have also bought the Atari XL hardback

Although this is rather informative it does not tell you how to create multi-coloured sprites

Also could you advise some books which will teach me machine code programming on the XL? – **Stephen Surtees, Croxdale, Co Durham**

● Firstly the Atari doesn t have multi coloured sprites so that explains why you are having problems generating them

You can of course use two or more sprites and move them about together which gives the same end result See Stephen Williamson s recent series on Player Missile Graphics for more details

If you want to start learn ng machine code try a book called Machine Language for Beginners from Compute! Books which will take you through the fundamentals n fairly easy stages

You should also consider buying a memory map such as Mapping the Atari from the same publishers

All systems are go...

I'VE been reading Atari User for quite a while and I've noticed an advert for 2 Bit Systems Replay Sampling System

Recently I've noticed that it isn't in any more Is this system still on the market as I'm very interested? I'd be very grateful if you could reply soon – **L. Hunter, Middlesbrough, Cleveland**

● 2 Bit Systems is alive and well and still supply the product you are interested in If you drop them a line they will send you more information

Waiting for the chop

I WOULD like to put a question via Atari User to the people at System Three Software For well over a year now we have been seeing adverts for International Karate on the Atari 8 bit range

But still we wait. Having written to System Three and receiving no reply I am hoping you will be able to find out for us all if the game exists at all? – **Kaven Joyce, Sheffield, South Yorks**

● System Three Software say that the Atari version of International Karate will be in the shops by the time you read this

time is 9999 seconds If however all the droids are captured in say 1000 seconds a time bonus of about 2000 seconds is issued

But the total is 1099 it does not seem to recognise 10000 So soon as the 1099 has run out, it does not carry on from 9999 it just runs out

This is most annoying and a good score cannot really be obtained – **Mrs D.P Sonnington, Stratford, London.**

SIX OF THE BEST

HERE are some tips for Atari games, I hope that your readers find them useful

Thrust *(Firebird) Having trouble getting past a level? As soon as you appear on screen shoot the reactor until the ground starts flashing After the countdown the planet will blow up and you will warp to the next level*

Nuclear Nick *(Americana) If you haven t already realised, pressing Start and then Select will allow you to start on different levels*

Strip-poker I *(US Gold/Artworx) When playing on the Suzi level, and you have changed your cards if Suzi says I stay", 99 per cent of the time this means that she has a bad hand*

So if you raise $25 the chances are that she will drop and you will win the money in the pot

Spellbound *(MAD) If your energy dwindles, get the bottle of liquid from the roof give it to Florin the Dwarf and then take it back to increase your strength*

To fix the control box in the lift get the Monner from Elrand Meiflewen and give it to Thor Summon Thor to the lift by using Somsun s elf horn ask him to help you using the word of command and Thor will hit the control box, then you can use the basement and ground floor The key and red herring can both be read for clues

Mercenary *(Novagen) There is a Palyar Colony craft in the air Its location is 64997 altitude at 08-02 When on the ground floor you can find a key*

The Eidolon *(Lucasfilm Games/Activision) To finish the first level you need the red jewel and you can kill the dragon with red fireballs*

To finish the second level you need the green jewel and you can kill the dragon with yellow fireballs

Level 3 blue jewel green fireballs Level 4 red and green jewels blue fireballs Level 5 blue and green jewels yellow fireballs Level 6 blue and red jewels blue fireballs

If you find yourself running out of energy when fighting the dragon keep hitting the spacebar quickly to collect all the fireballs the dragons shoot at you

Keep up the great magazine – I look forward in anticipation to the next issue! **Mark Stephens, Putney, London**

CHIMERA

SOME hints on Chimera First you need a spanner You can eliminate electric fences with this by going up to them and pressing fire

Eliminate all fences then get the bolt and go to a blue room and press fire Then you will need bread

Go to a toaster and press fire

You need to follow the same procedure as with the electric fences

Behind the first toaster is a key Now you can open the door You also have to find a padlock.

Some passwords for Ollies Follies – type these in as you begin the game

Level 5 Frank
Level 9 Fonda
Level 13 Norbi
Level 17 Zoom

Hints needed Password on Whirlinurd – **A Mitchell.**

More light on lights

AFTER reading your article about disco lights in the December 1985 issue I decided to manipulate this program for my own uses Here is the finished copy

```
10 POKE 54018,52
20 GRAPHICS 19
30 FOR I=3 TO 15
40 POSITION 5,1:? #6;"aa
aabbbbbcccccdddddeeeeeffffgg
ggghhhh"
50 NEXT I
60 POKE 77,0
70 POKE 708,PEEK(53775)/4
80 POKE 709,PEEK(53771)/3
90 POKE 710,PEEK(53887)/2
100 GOTO 60
```

To test this program type it in type RUN insert a music tape with a good beat and press PLAY on the tape recorder Now you can sit back and watch **– Ivan Macintosh, Sulwall, Nottingham**

File type parameter

IN the September issue of Atari User *on Page 41 you said in answer to a question that 'There is no practical way of designing a turbo loader for the Atari without modifying the hardware' Yet on Pages 36 and 54 I see advertised turboloaders for the XL which are on tape*

I have read that the third parameter in the open command indicates file type does this parameter always have to be zero? The command

XIO 18,#6,0,0,' B:'

can be used to fill shapes

What are the 5 parameters for and does XIO have another use with a resemblance to the OPEN command?

Finally can you save a multi dimensional numeric array on tape– **A Pyraki, Slough, Berks**

● The XIO command can be used to perform most of the Input/Output functions available on the Atari The first number specifies the operation and the next the channel number if applicable

The two zeros you refer to can be used to provided extra information For example the OPEN command can be mimicked by using

XIO 3,#1,6,128, 'C:'

Code 3 means OPEN and we are using channel 1 The 8 sets the file for output and the 128 tells the computer to use short Inter Record Gaps like a CSAVEd program does The C: is just the normal filename specifier

See the manual or other Atari Basic books for information on the various functions of XIO

You can save a multi dimensional array by going through FOR NEXT loops and PRINTing every element to a tape file You can then reverse the process and read them in again with INPUT

For example to output the data use

```
10 DIM ARRAY(10,10)
100 OPEN #1,8,0,"C:"
110 FOR X=1 TO 10
120 FOR Y=1 TO 10
130 PRINT #1;ARRAY(X,Y)
140 NEXT Y
150 NEXT X
160 CLOSE #1
```

and to read it in again use

```
10 DIM ARRAY(10,10)
100 OPEN #1,4,0,"C:"
110 FOR X=1 TO 10
120 FOR Y=1 TO 10
130 INPUT #1,NUMBER
140 ARRAY(X,Y)=NUMBER
150 NEXT Y
160 NEXT X
170 CLOSE #1
```

Make sure you keep the loops the same way round or you'll end up with the array reversed

Basic on the 800XL

I OWN an Atari 800XL and 1050 disc drive which I bought about a year ago

I was very keen on learning Basic but the Atari Basic manual which I got with the computer is about as useful as a syntax error

Now I really want a book about Basic for the Atari 800XL I have looked everywhere but I can't find one I wonder if you can help me to locate one? **I D Osborn, Ipswich, Suffolk**

● The best book for your purposes is the Atari 130XE Handbook which as we have said before actually covers the 800XL as well as the 130XE the only difference being two pages which deal with the 130XE's bank selected memory

If you can't get one locally why not try ringing one of the larger mail order companies which advertise in Atari User every month such as Compumart Software Express or Silica Shop

Contact needed

PEN pal wanted – I am 12 years old and have a 130XE and disc drive I would like a fellow Atari enthusiast in this country as a pen pal Thanks for a brilliant magazine! **– John Senks, 37 Wirksworth Road, Duffield, Derbyshire DE6 4GH**

They games they play

I AM a proud owner of a 130XE Atari computer and a 1010 tape recorder

In your July edition you had an article that said Atari had invaded Poland and that Atari was doing quite well over there I am pleased about this and I hope Atari can move into and do well in other countries

I am sorry to say that US Gold has invaded Russia but in quite a different way I am referring to Raid Over Moscow

I am quite sure that not many people in Russia are going to want to play a game where they have to bomb their own capital city

So if more software games like this one are released I am quite sure that Atari will not spread any further into the East Think about it would you buy a game called Raid Over London?

Also I would like to compliment Atari User *on a wonderful magazine I enjoy your reviews and buy it every month* – **Mark Hall, Great Glen, Leicester**

Heads you lose

I BOUGHT Spellbound from Boots it didn't work so I got my money back. I bought it again from another shop and again it didn't work

I did exactly what the loading instructions said so I am not the cause I even cleaned my tape heads but still no joy

I wondered – does Spellbound work on an old style Atari 800?

I don't expect both of the tapes I tried were faulty

I would like to say that Firebirds Thrust is brill and I cannot wait to get Ninja Master when it comes out – **Gary Hilsdon, Berinsfield, Oxon**

● As far as we know Spellbound should indeed work on an old 800

The problem could be a slightly misaligned head on your tape recorder which would cause some tapes not to work while most seem to load correctly

Try taking your computer with you next time you go into Boots and check the game out on one of their recorders

Recording photographs

REFERRING to the letter from Mr Forrester in your October issue I would be willing to put photographs on to disc cassette

The cost would be minimal enough to cover disc and postage Also if anyone is

interested in seeing some digitised pictures free then just send a blank disc or cassette and return postage and I will put some pictures on there!

If you are interested write to me at Cornerways Luxford Drive Crawborough East Sussex TN6 2PN or phone 08926 62698 and ask for Stephen. Hope this will help some people – **Stephan Boxley, East Sussex**

Colour TV resolution

I WOULD be most grateful if you could answer the following questions the first technical the second ethical!

I am on the verge of buying a 520STM. I do not wish to buy a monitor – is there a marked loss in resolution when using the 520 with a colour TV (14in RGB)?

The Atari ST's are obviously in a class of their own and prospective buyers should realise that they really are getting power without the price.

However software for the ST is not cheap and not so many years ago 8 bit machines were victims. I believe of a similar situation.

Little interest was generated in the early days because software was expensive and scarce and a computer offering more than its rivals really had to struggle to tread water.

Is it not possible that current ST software prices will have a similar effect and (heaven forbid) is this going to lead to piracy just like it did in the early days of the 400/800?

It seems unfair that a computer offering so much for so little should be subjected to these possibilities when only a few years ago Atari and Atari programmers were learning their lessons the hard way.

Are these prices justified and do you think they will improve?

Thank you for a great all-round publication – **S E Hislop, BFPO Ships, London**

● You will find that the 520 STM can be used in both low and medium resolution on a colour TV but that medium resolution text will be very hard to read and the labels below the file icons almost impossible.

However if you can connect it via the RGB port you will notice a distinct improvement but not to the extent that you would with a good colour monitor.

DIY modems are out

I AM thinking of building a modem for my 800XL. As I have had a considerable amount of experience in building various projects I don't consider this to be too difficult.

However is it legal for me to simply plug in and switch on using my new modem or is there some kind of license that I need to obtain?

If so could you please tell me where I can get one. Also what kind of interface do I need and how much will it cost and is it possible to build one?

Finally I would like to thank you for your excellent series on Great Little Gadgets not to mention the mains control box.

After building it I decided to set it up for a few tasks like waking me up in the morning by switching on the light and the coffee percolator for a nice hot cuppa.

However I awoke to total chaos. Finding the cat hypnotised by the flashing light the coffee machine leaping around the room giving off a huge cloud of boiling steam which turned the room into a sauna and apart from all this I was late for work.

Anyway I seem to have got over all these minor teething problems by altering my software. Thanks for a great mag and keep up the good work – **Simon Rees, Ebbw Vale, Gwent**

● The question of home built modems is a tricky one. You may feel confident in building one but British Telecom will certainly not regard you as a qualified telephone engineer. For this reason no home brew modem kits – such as the Maplin one – are ever likely to be approved and are hence illegal to use. You can easily connect one to your phone but not legally.

If BT finds out it may well cut you off. That said there are lots of people who own such units and take the risk.

To connect any modem to the computer you will require an RS232 interface such as the Atari 850 and the relevant software.

If you feel confident at machine code programming you could try writing your own RS232 software to work via the joystick ports.

Beware though – you might find that this causes the phone to jump around the room like your coffee machine did!

Missing top games

I WOULD like to know why Atari is bringing out top arcade games like Paperboy and Ghosts and Goblins for every make of computer except the Atari itself.

We Atari users are supporting Atari by buying its computers and software only to find the better new games are only available for other machines.

Why are we getting a raw deal? Why should we buy the software if we can find it – when Atari is backing Spectrum users and so on.

There is no wonder people turn to pirating. If Atari users stopped buying computers and software where would Atari be then? – **An Atari User, Hull**

Back to the beginning

I HAVE just purchased an Atari 800XL pack from Dixons for my children.

While we can run the games tapes that is as far as we can go. Having tried unsuccessfully to program games from a games book I feel we need to understand what we are doing from the beginning.

Can you tell me whether there are any publications which are idiot proof for the beginner with no computer knowledge at all? Also stockists of games and so on in our area.

While you have games at £2.99 in your magazine the only stockist I have found is Boots with a limited range starting at £6.99.

Any information you can give will be very gratefully received and hopefully allay my fears that I have made a wrong decision with this purchase – **Mrs L C Dryden, Poole, Dorset**

● If you can't find a local retailer who has the games you want why not try looking through the pages of *Atari User* for a mail order company which advertises such items?

You will find most of them offer a speedy and efficient service and a far larger range than most local shops ever do.

As for a good book for beginners you might like to try Inside Atari Basic or the 130 XE Handbook – again available from most mail order dealers.

Memory map

I WOULD like to know where I could get a memory map for my Atari 800XL and how much it would cost – **Damyan Pepper, Midsomer Norton, Bath**

● The book you require is called Mapping the Atari (XL/XE Edition) and is published by Compute! Books at £16.95.

You could order it from your local bookshop or get a copy from Software Express. Compumart or one of the other mail order dealers.

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NEWSLETTER

Books and bookmen

BUYING and selling rare and out-of-print books isn't as fusty a business as it may sound – even for a firm founded when Robert Peel was prime minister

Antiquarian bookseller Wheldon & Wesley has been trading since 1843 but is bang up-to-date when it comes to communications thanks to MicroLink.

Speed is important in locating rare publications then buying and selling them at the right price

And as 60 per cent of the firm's business involves dealing with people in countries all over the world MicroLink's telex and other messaging services are proving invaluable

Although we specialise in natural history we're very willing to search for any rare books other people are looking for says director Tony Swann a member of the family which has been running Wheldon & Wesley since the 1920s

And where great distances are involved MicroLink is often the fastest and most economical means of doing the job

Our clients are universities museums and librarias private collectors and fellow dealers – and two-thirds of them are abroad

At present most of our business with the United States is done by telephone but we should soon have an efficient transatlantic mailbox system via MicroLink – and perhaps even a special interest database as well

Best foot forward

STOCK control procedures at a fast-expanding chain of footwear specialists in London used to be rather a marathon slog

Now the system is more like a sprint – thanks to MicroLink

Cobra Sports Shoe Shops has blossomed into an eight-store chain in as many years selling to top international athletes as well as spare-time joggers

It all adds up to a mountain of shoe leather – or rather spikes and rubber

Before MicroLink daily stock reports were written by hand and the sheets sent by next available delivery van to the firm's head office some times two or three days later

Now the information from each shop goes directly every night onto Cobra's MicroLink mailbox for retrieval next morning and processing on the firm's IBM computer Up-to-the-minute stock control has been achieved without great expense – instead of a micro each store uses a Psion Organiser

This gives us simple one-button operations that are easy for the staff to pick up says Cobra systems manager Daniel Brown

And I've successfully written an autodial file sending procedure in OPL on my Psion which speeds up the process even more

Link grows

MICROLINK subscribers can now communicate directly with two more countries through the world's biggest electronic mail and messaging network Dialcom

Italy and Japan have joined the system bringing to 14 the number of countries offering this global service

More free software

MICROLINK'S telesoftware library is being reorganised and considerably extended

The programs run on five types of computer – BBC Micro Apple Electron Ateri and Amstrad

There are now nearly 150 free programs in the MicroLink telesoftware library and this number will be substantially increased during the next few months

Going with a bang

HAVING survived his childhood hobby of making fireworks – somewhat luckily he says – Jon Culver house went on to other things

But he never lost his fascination for colourful explosions and now with a little help from MicroLink he's creating them all over the country

As boss of Fantastic Fireworks Jon was responsible for something like 65,000 bangs around Britain this November 5th

For the past two years Jon has been selling fireworks imported from places like Germany Spain – and even China where pyrotechnics originated

He keeps in touch with his suppliers via MicroLink's telex facilities and uses electronic mail to publicise his services

These include packaged displays costing from £80 for a family bonfire party to £5,000 for say a town's Royal Wedding celebrations

I've found that sending information via MicroLink is the most effective method of getting publicity for my company in the media says Jon

My displays have already been featured on Saturday Superstore and Pebble Mill at One as a result

Fly me...

THE Official Airline Guide database available on MicroLink includes information about nearly 30,000 hotels as well as flight and fare details for more than 750 airlines

The coverage spans 17,000 hotels and motels in North America more than 9,000 in Europe and more than 2,500 in the Far East and Pacific area

Details displayed include the full postal address telephone and telex numbers and the range of rates plus an official classification in most cases

YOUR chance to join MicroLink – turn to Page 16

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KEYBOARD DEFINER from F. Van GILST

THIS five liner from a reader in Holland not only lets you modify the keyboard definition table but also adds five useful edit functions

Save the program after you have typed it in and run it Now press the key that you wish to redefine The program will respond with Give Character You now type in the character that you wish to store in this key and the program will do the rest

For example you could press Shift+Space and enter a semi-colon when asked Give Character From then every time you press Shift +Space a semi-colon will be printed on the screen

```
1 DATA 104,160,191,177,121,153,5,8,136
 192,255,200 245 96,1697 142,1700 144
1702,143,1724,145 1726 137,169 5 133
2 FOR L=1730 TO 1751:READ D:POKE L,D N
EXT L X=USR(1718) OPEN #1 4,0,"K " FOR
 L=1 TO 5 READ A,B POKE A,B NEXT L
3 A=PEEK(764) IF A 255 THEN 3
4 POKE 764,255 ? "GIVE CHARACTER":GET
#1,B:POKE 1545+B,B POKE 764,255 GOTO 3
4?#1;B 1551
5 FOR L=1,9:POKE 122,6 FOR L=1536 TO
1544 READ B POKE L B NEXT L CLOSE #1 E
ND 104,0 121,165,6,121,122,96
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
1 36710	2 35555	3 4956
4 35265	5 10141	

LINE BREAKDOWN

1 Contains the data for the program
2. Pokes in the data and opens a channel to the keyboard
3 Waits for a key to be pressed
4. Inputs the replacement character
5 Replaces the character in the table

RIVER from A P. PICKETT

RIVER is a simple game in which you control a boat using a joystick in port one

Moving the boat from side to side you see how far you can get up the ever narrowing river

LINE BREAKDOWN

10: Sets up the variables
20 Puts the boat on the screen and reads the joystick.
30. Randomly decides on the width of the river
40 Advances your points
50: Tells you how far you travelled

JOYSTICK TEST from WILLIAM ANDERSON

JOYSTICKS can be very unreliable and it is often difficult to tell whether the program or joystick is at fault To find out easily type in and run Joystick Test

LINE BREAKDOWN

10· Initialises the screen and asks you which joystick port you wish to test
20. Checks the port number is valid and checks for a key press
30· Reads the description from line 50 for the current value of *STICK(P)*
40. Informs you if the button is pressed
60. Date statements for descriptions

```
10 DIM A$(151) OPEN #1 4,0,"K " GRAPHIC
S 0:POKE 752,1 POSITION 11,10 ? "WHICH
 PORT NUMBER?";:GET #1 P P=P-48 ? "R"
20 IF P<0 OR P>3 OR PEEK(764)<>255 THE
N POKE 764,255:RUN
30 RESTORE 50:STICK(P)=P:FOR I 1 TO 5?
READ A$ NEXT I POSITION P,11 ? "A" POS
ITION (40-LEN(A$))/2,12 ? A$
40 IF STRIG(P)=0 THEN POSITION 13,8 ?
"BUTTON PRESSED"
50 GOTO 20:DATA ,      RIGHT-DOWN RIGH
T-UP RIGHT, ,LEFT DOWN,LEFT-UP,LEFT,
DOWN,UP,CENTRE
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
10 35472	20 5701	30 15240
40 5721	50 17003	

```
10 P=20 DIM S$(8),B$(39):B$(1)="■" B$(
39)=■:B$(2)=B$ S$="          " X=35 PO
KE 752,1 M=PEEK(88)+PEEK(89)*256 A=0
20 POSITION 0,23 ? B$,.POSITION X,21 ?
 S$ S=STICK(0) P=P+(S-7)-(S=11)-9*PEEK
(CHKP)/R R=RND(0)*2*(X<LEN(S$)*10)
30 POKE M+P 54*X A=RND(0)*2*(X>0) IF T
)20 AND LEN(S$)>1 THEN T=0 S$=S$(1,LE
N(S$)-1)
40 SETCOLOR 1,0,10 SETCOLOR 2,7,4 T T+
S:A A+1:IF A=8 THEN 20
50 ? "■";POSITION 2,0 ? "YOU TRAVELLED
 ";X;" M DOWN THE RIVER" FOR I=1 TO 80
0 NEXT I ? "S" END
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
10 17712	20 18576	30 14225
40 18538	50 17545	

DECIMAL TO BINARY CONVERTER

FROM A R. WEIR

THIS small loader program sets up a machine code routine which will give you an extra Basic command that converts decimal numbers into binary strings

For example if you enter the number 2 and call the routine naming *A$*, then the routine will place *00000010* into *A$*

Type in the program and remember to save it before you attempt to run it. After you run the program you will be able to use this new command

X=USR(1741,A,E)

Here *X* is a dummy variable 1741 is the address of the machine code routine *A* is the number to convert and *B* is the address of the string which will hold the binary number For example to convert 2 into *C$* in binary you would use

X=USR(1741,2,ADR(C$))

LINE BREAKDOWN

1. Identifies the program
2. Reads and pokes in the machine code
3. Prints out all the numbers between 0 and 255 as a demonstration
4. First chunk of data
5. The remainder of the machine code data

```
1 REM Decimal-Binary Converter
2 CLR :DIM BN$(8):BN$="00000000":REST
ORE 4:FOR C=1741 TO 1783:READ D:POKE C
,D:NEXT C
3 FOR I=0 TO 255:X=USR(1741,I,ADR(BN$)
):? BN$:NEXT I:END
4 DATA 104,104,104,162,202,104,133,200
,104,133,204,160,8,165,45,145,204,200,
192,0,208
5 DATA 249,169,1,150,7,36,203,240,6,17
0,169,49,145,204,136,136,10,192,255,20
8,240,96
```

Get it right!

LINE CHSUM | LINE CHSUM | LINE CHSUM

1 13735	2 14953	3 10834
4 12492	5 12347	

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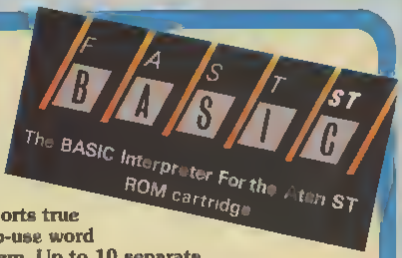
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The ST – by appointment

IF there was ever any doubt that the ST is a superb entertainment machine this has now been removed

For it has been given the seal of approval by MicroProse no less – for the uninitiated that's akin to sporting a By Appointment to Her Majesty

Not that the name MicroProse may be all that familiar to some ST users in the UK for the moment at least After all it has only just released its first title for the machine

However MicroProse just happens to be the Rolls Royce of the software industry in the USA with its award winning sophisticated simulations

So when you get MicroProse writing for your machine you know you've got a winner on your hands observed one leading industry figure recently

For the corporation is known to select the names it hops into bed with with extreme care

The most pressing reason for this being that it budgets up to $1 million on developing each of its titles So the end product must essentially become a blockbuster

'What they have aimed for and what they have got with each of their 14 titles to date is something equivalent to Gone With The Wind in film terms a leading American computer journalist wrote recently

As a result quality for once has ensured quantity and that has translated into the corporation becoming the third largest entertainment software house in the States

Nor is it a stranger to the world of Atari For on the 8 bit front it already provides 25 per cent of all software sold in the United States And MicroProse recently received an award as the most consistent supporter of Atari in the USA.

Its first title for the ST is Silent Service a mind blowing submarine simulation which arrives with the most impeccable of credentials

Previously released for the IBM and Apple it recently topped the famous Billboard Chart in the States for four weeks having been at number two for three months before that

In all Silent Service has won five major awards the latest being the Best Computer War Game of the Year presented by the Gaming Association of America

So what makes it so good as to be able to beat the pants off 25 other top class nominations?

The answer seems to lie in the corporate slogan 'The Action Is Simulated – The Excitement Is Real' For the experts behind the MicroProse simulations make them accurate in every detail

Such is the realism involved that one of the MicroProse packages – Solo Flight – is used as a teaching aid by Cessna Flying Schools in the States

All the titles call for making real life judgments and decisions as the users are called upon to perform a variety of challenging roles And Silent Service is certainly no exception

The thrill and danger of captaining a World War II submarine in the South Pacific can be experienced through a wide selection of historical scenarios ranging from single-ship attacks to multi-patrol missions with heavily escorted convoys

All of the submarine's critical battle stations are replicated – the conning tower engine room and ship's bridge

Player selected reality levels provide challenge and complexity Automatic time scaling insures that actions and decisions are constantly required

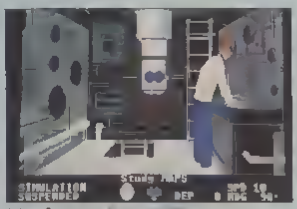
In his review of Silent Service in the American Antic magazine Naval Commander Rich Moore wrote

'The simulation experts at MicroProse have outdone themselves you can almost smell the diesel oil and feel the deck rolling beneath your feet

Nor was the ST version of Silent Service simply a quest on of porting it over from a previous version MicroProse doesn't do things like that

The program has been completely re-written to take full advantage of the machine's graphics sound and play-action capabilities

It features a detailed map system and enemy targets intricately designed instrumentation and



Silent Service superb simulation

submarine interior and an expanded enemy fleet to include heavy cruisers and aircraft carriers

The sound effects of the sea engine enemy ships and submarine klaxon have been compared to studio recordings

Game controls have been simplified to employ on screen icons for all activity selections so that the submarine can be controlled entirely by using a mouse only Naturally it also operates with a joystick or the keyboard

Silent Service promises to be the first in a whole-line of high quality simulation software for the ST from MicroProse

The reason for this – according to a company spokesman – is that they see the ST as one of the most exciting machines to enter the home computer marketplace in a long time

Given the quality of its games and its commitment to the ST the entry of MicroProse to the ST market promises great things for the future

Mike Cowley reporting

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COMBINING the most stunning chess graphics you're ever likely to see on a home computer with fast and powerful play, Psion's new release is set to checkmate every other chess program on the market.

The graphics grab you by the throat. The large board and pieces are shown in full screen 3D perspective, the view being almost identical to what you would have if you were sitting in front of a real chess board.

You make a move by pointing and clicking the mouse on the desired piece, dragging it to the destination square and clicking again. Unlike the desktop facilities, there's no flicker or ghost imaging while dragging – the pieces glide across the board like a finger across satin.

When a piece is moved by the computer it too slides smoothly and unerringly to its destination square. Should a check result from either side the involved pieces gently pulsate.

No illegal moves are permitted – a warning bell sounds if you attempt to make one. Any move can be cancelled before the second click by returning the piece to its original square.

Psion Chess is rich in options all accessible from pull-down menus. The accompanying manual gives you enough information to get started but most of the detail is built into a Help option which can be called up at any time. All text within the program is available in any of six selectable languages including English, French and German.

Games may be between player and computer, two players or computer against computer. There is a wide range of computer speed/skill levels to choose from, ranging from novice through matching your own speed (equality) going right up to infinity (the computer keeps analysing until you force it to move).

An excellent two dimensional display is also available. This only takes up half the screen, leaving room for chess clocks and move records to be displayed alongside the board.

A graphically superb and simple to use board set-up facility allows you to arrange your own positions for playing or for solving mating problems. The pieces skate on to and out of the board at your command. Psion Chess can solve mate problems of up to nine moves ahead by either side.

Some of the many other options are hint, take back, offer a draw, enable/disable computer's ability to resign, automatic replay (with optional forward and backward stepping) and analysis (computer's evaluation of position and current line). It's also possible to save a game for later reloading, invert the board, force the computer to make its best move so far, play its next best move and change sides.

The beauty of this program is not just skin deep. Behind the astounding graphics and wealth of options there lies a powerful chess-playing program. Psion Chess was in fact a recent winner of the World Microcomputer Chess Championships.

The program comes handsomely packaged and includes 50 classic games for you to study and replay.

This is an immaculate program and a joy to use. Whether you're a novice or a budding Kasparov, Psion Chess has got to be the one chess program that you simply must have – quality as high as this doesn't come along every day. Buy it! ■

Reviewed by Bob Chappell

Sound	*N/A*
Graphics	*10*
Playability	*10*
Value for Money	*10*
Overall	*10*



3D ... Psion Chess ...



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WHEN Starglider was first shown at the 1985 PCW Show it was six months into development and consisted of just a few 3D routines written in machine code. A year later it has grown into a game which author Jeremy San had trouble squeezing into the ST's 512k of memory.

Having previewed Starglider in the September issue of *Atari ST User* we're going to take a more detailed look at the finished product and its gameplay.

The first thing that strikes you when you run Starglider is the stunning title screen and amazing music which accompanies it. The music – the Starglider song – has been specially recorded then digitised and stored in 170k of the ST's memory.

A quick press of any key and you're flung into your Airborne ground attack vehicle (AGAV) flying low over the planet Novenia which has been overtaken by the evil Egron fleet. The graphics give a stunning 3D representation of the planet's surface and the multitude of enemy craft through the AGAV's window. They are based on the vector graphics from such games as Battlezone but use the ST's resolution and colours to far more effect. The game can be played in black and white or colour.

Your ship is controlled with the mouse acting as joystick. A move to the left and the AGAV banks to the left; a move forward and the AGAV loses height and so on. Speed is also controlled by the mouse. Keeping the right hand button pressed you move the mouse forward to speed up and back to slow down.

Your primary weapon is the trusty old laser beam which is backed up by missiles. You are supplied with only one missile at the start of the game and must dock in a supply silo to replenish your stock. The laser guns are aimed using the cross hairs in the centre of the display and fired by pressing the left hand mouse button.

The Egron fleet is vicious ranging from the magnificent red Starglider One with its flapping wings through tri-launchers – which fire three missiles at once – to ugly land based walkers. Most of the enemy fire deadly red missiles which can cause a quick depletion of your shields.

For their part some of the enemy can only be destroyed with a missile while most need multiple hits with the laser. Some of the more menacing Egrons such as Starglider One require more than one missile hit which is difficult because you must return to the supply silo for each missile.

A missile is launched by pressing the spacebar. A voice says 'Missile Launched' and a view from the missile's nose cone is shown. You only have a few seconds to steer it to its target before it detonates.

Docking with the silo is a tricky business which requires practice. When you have successfully docked you can call on the computer in the silo to report on the relative strengths of the various enemy craft. Entering a silo gives you an extra missile and replenishes your energy and shield. Dock again too soon and a missile won't be available since it takes a fixed amount of time to be manufactured.

Refuelling is probably the most difficult part of the game. I don't want to give too much away but I will tell you that this is accomplished using the three energy towers on the planet surface and a very tricky flying manoeuvre.

The full background story is given in a 64 page novella which also gives clues for gameplay. You could play Starglider on its shoot-em-up merits alone for some time but eventually a read of the novella will allow you to refuel and get more out of the game.

With some arcade type games the danger is that you can explore them fully during a demonstration in a shop without realising it. Then when you get the game home you find there's nothing left to do. This won't happen with Starglider. The further you get into it the more it offers you. It definitely gets my vote for *Atari ST User* game of 1986 (and possibly 1987 as well). ■

Reviewed by Andrew Bennett



Artist's impression

Sound	9
Graphics	9
Playability	10
Value for money	9
Overall	9

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Buying a present for your ST?

IF your ST has been crying out "What are you going to get me for Christmas?" or if you have a loved one who owns an ST, this article will help you through the hardware and software jungle so that you can easily decide what Christmas presents to buy them.

The problem with buying presents for a computer mad friend is that you often have no knowledge of what is good or bad – and computing can be a very expensive hobby. To help you decide we've split the presents into three sections depending upon their price.

In the computer market the least you can get away with paying is probably in the £5 to £20 bracket. There are dozens of programs and accessories for the ST that fall into this category and at this price they make the best small presents or stocking fillers.

Two ideas from the Macintosh market that have just appeared for the ST are the mouse mat and mouse house. The mouse mat – which sells for £9.95 – is a small vinyl covered mat which sits beside your ST and under your mouse. Moving the mouse over the mat instead of your dusty desktop will keep its insides clean and trouble free.

The mouse house is a cover for your mouse which costs £7.95. However this is no ordinary plain dust cover – it's furry and has two small eyes which make your mouse look both cute and alive. Not recommended to those who don't like real mice!

Dust covers also fall neatly into this price category. If you leave your ST unattended for long periods you should make sure that large amounts of dust cannot build up inside the ST itself or its disc drive and monitor. Moulded to shape, a dust cover protects against this.

There are covers available for the drive, monitor or the ST. If you are going to buy the ST cover you should make sure that you get the correct size as the 520 models are smaller than the 1040ST.

Items such as printer ribbons, paper and blank discs are always being used up at alarming rates and will be gratefully received. Make sure though that you buy the correct sizes and specifications for the equipment owned. Ribbons are different for nearly every make of printer, but simply naming the printer will ensure that you get the right one. Printer paper is most commonly 9 inches (22.5cm) wide, with a sheet length of 11 inches (27.5cm).

Blank 3.5in discs for the ST can be either double or single sided. There are many makes of disc, which can often confuse the beginner who is naturally drawn to names that he recognises – but may have to pay a lot more for. As with video tapes there are only four or five actual manufacturers of discs – most of the cheaper brands are simply relabelled versions of the more expensive names. Nobody will hate you for buying X brand discs instead of Y. Prices range from about £15 to £35 for a box of ten.

Disc boxes can be bought for as little as £12.95 for a box which holds 25 discs. Once again a box for 3.5in discs must be purchased. A disc box will stop you losing discs and will keep them clean and dust free.

Although the average computer game costs between £9 and £15 for 8 bit micros, the majority of ST games fall into the £20 to £35 range. However there are some games under £20. The most notable of these are Colourspace and Major Motion.

Colourspace from Llamasoft is described as being to light what a music synthesiser is to sound and is the modern equivalent of a kaleidoscope. Its effect is hypnotic. Everyone should have a copy.

Major Motion from Microdeal costs £19.95 and puts you in charge of a small car which is released on to a busy highway from the back of a van. It was reviewed in the August 1986 issue of *Atari ST User*.

With the ST being more expensive than the average micro the £20 to £60 range is where most of the products for it fall.

For starters there are literally dozens of games, some conversions of 8 bit versions and other brand new titles.

With the ST's speed and large amount of memory, arcade games are getting closer and closer to real arcade quality – and among the best of these are Joust and Starglider.

One of the first commercial programs written for the ST, Joust the has only just been released by Atari. You're in charge of a strange emu-like bird in a contest against the computer controlled enemy. It is a faithful reproduction of the arcade game of the same name, even down to the flapping of the bird's wings.

Based on a Star Wars scenario Starglider – reviewed elsewhere in this issue of *Atari ST User* – is probably the ST game of the year and well worth the money at £24.95 from Rainbird.

A title that might be in the shops before Christmas is Marble Madness from Electronic Arts. This game puts you in control of a ball

Santa Andrew Bennett delves into his sack of goodies

bearing as it careers around a course and is true in every way to the arcade original

Adventure games for the ST fall into two camps: text only and graphic. The text only titles from Infocom have become classics since their introduction to the micro scene in the late 70s. However as the graphics capabilities of home computers have increased over the years adventure games which also include pictures of their various scenes have grown in popularity.

One game which caused much favourable comment when it was introduced earlier this year is The Pawn from Rainbird. Costing £24.95 and billed as an Infocom-type game with graphics. The Pawn includes many professionally drawn pictures.

Also worth looking out for are the range of adventures from Activision. Borrowed Time has you as a Sam Spade-type character who must solve a crime. Tass Times in Tone Town is set in an alternative universe populated by strange creatures and where everyone speaks Teen Speak.

There are many simulation games available for the ST ranging from golf to flying. The ones to look out for in this category are Leader Board from Access and Mean 18 from Accolade – both golf games. Leader Board costs £24.95 and gives a true 3D representation of each hole while Mean 18 costs £44.95 but offers the ability to design your own courses with its built-in editor. Silent Service from Microprose simulates undersea warfare and is well worth its price of £24.95.

Strategic games for the ST are few and far between at the moment. Probably the most interesting and notable is the newly converted Psion 3D chess. This is a complete computer chess player that is better than most dedicated machines and sells for £24.95.

Also in this price range are a number of utilities including ram discs, printer buffers, desk accessories and disc doctors. The best value desk accessory is probably the Back Pack cartridge from Computer Concepts (reviewed in last month's *Atari ST User*) which includes nine desk accessories for £49.95.

Always welcome is a good disc doctor program – these repair faulty or corrupted discs. Best known of these are Michtron Utilities from Microdeal and Disk Doctor from Antic software.

When we enter the £50 to £250 price range we start to leave the area of software and enter the region of small hardware devices and add-ons.

First off the mark is Fast ST Basic, the cartridge language from Computer Concepts (reviewed in last month's *Atari ST User*) which costs £89.95. Judging from ST owners' reaction to this new Basic, Computer Concepts is going to sell thousands during the next few months.

Several other languages fall squarely into this price range. The favourite language for the ST is still C and the most popular C compiler is from Megamax which includes a linker, editor and resource program for £157.55.



Additional disc drives for the ST are made by three manufacturers. Atari makes the most expensive of these with single sided drives at £150 and double sided at £199. Cumana and Advanced Technologies and Techniques both produce double sided drives at lower prices. Cumana charges £159 for one 1Mb double sided drive and £269 for two. AST's drive costs just £99, but requires an Atari drive to connect to.

For those with colour systems, £150 will buy an Atari black and white high resolution monitor. Definitely not a downgrade, this will allow you to use some of the ST's professional programs which only operate in high resolution which is unavailable in colour.

In these days of cheap disc drives, adding a printer to the system is usually left until last. ST compatible printers can cost anything from £150 to several hundreds of pounds. An Epson compatible printer is best, since the ST is set up to do graphics and screen dumps on an Epson printer. And make sure you get the lead when you get the printer!

And that about sums it up. Of course if you've got money to burn you might consider upgrading from one ST model to another. By Christmas Atari will be shipping the new 2Mb and 4Mb ST models. If you are friendly with your dealer perhaps he'll be prepared to take your current model in trade in for one. If you are prepared to spend this much on your ST, then I'm sure that it will be very happy with you for the rest of the year. ■



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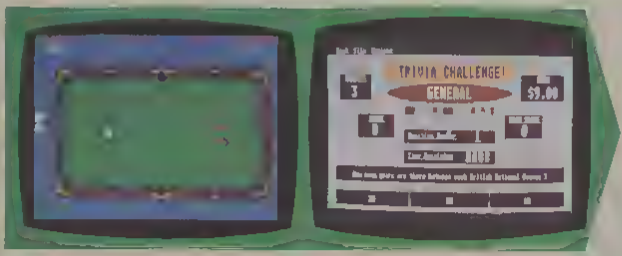
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I HAVE had some interesting correspondence this month. Top of the agenda was the ST v Amiga rivalry. Among many others Mr R.J. Griffin has asked about their relative merits.

The machines are bound to be compared. Both are 68000 based computers. Both offer excellent colour graphics and both have large amounts of memory. When making comparisons between the systems you might like to take the following points into consideration.

Although on paper the Amiga specifications seem more impressive it has been hampered both by a lack of built-in memory and Commodore's indecisive marketing. The Amiga has better graphics with more available colours than the ST. Graphics displays are made much faster by the presence of the Amiga's blitter chip which automatically speeds up all such operations. The Amiga also has better sound capabilities and offers full stereo.

While the ST lags behind on most of these features being first on the market has meant that the ST can call on four or five times more software titles than the Amiga. In addition, the Amiga has also been slow to catch on because of its price – for a 512k computer with 512 colours and very high resolution graphics (for a micro) the ST is truly Power Without The Price.

And the ST's capabilities are increasing. Atari has a blitter chip for the ST which will be available before the end of the year (see *Atari ST User* for November) and hope to introduce both stereo sound and graphics chips before the middle of 1987. Their addition will bring the ST up to and in some cases surpass the Amiga.

My advice therefore is to buy an ST now and expand it by adding the new chips when they become available and if you find you need them. In this way you'll finish up with the computer best suited for your needs without paying for any unnecessary frills.

★ ★ ★

Harvey Jacobs of London is about to start work on a game which he hopes to market one day and he wants to know which language is best for beginners. Until a couple of months ago my answer would have been that the only programming language to make full use of the ST's features – including Gem – was C.

However my opinion has changed now that I've had a chance to use a copy of Computer Concepts' Fast Basic (reviewed in the November issue of *Atari ST User*). This implementation of the language is easy to learn, fast and gives nearly complete access to the ST's capabilities.

In the near future Computer Concepts hopes to produce a compiler for Fast Basic which will allow you to create stand-alone programs. This will mean that you will be able to sell or give your programs to ST owners who do not own Fast Basic itself.

★ ★ ★

Stephen Vasey has written from Switzerland where he and his faithful ST are currently shivering through the winter. He'd like to make some ST friends in the UK and can be contacted at Montchoisi 29, 1008 Lausenne, Switzerland.

★ ★ ★

Many of you have asked how the 512k version of the ST is termed the 520ST. Leonard Tramiel gave me the answer expressing slight annoyance at the names of the two new machines.

He explained that up until now all of the recent Atari computers have been numbered by taking the number of bytes of built-in ram that the computer has and rounding it down to the nearest 10,000.

This means that a 2Mb computer should be numbered 2090 and a 4Mb model should be numbered 4190. It seems that the development department at Atari (where Leonard Tramiel works) was over-ruled by the marketing men who thought that double a 1040 is a 2080 and double that is a 4160. But of course now we know better.

★ ★ ★

Keep the questions rolling in. Remember that I can also be contacted on Telecom Gold or MicroLink at 72:MAG001 or at Prestel box 614568383. Make sure that you mark your question *Atari ST User*.

I'll be at the Atari User show at the end of November and hope to see you there. A Merry Christmas to everyone. ■

As you know, we always welcome submissions of ST-related articles and programs. Until now we have only accepted programs in ST Basic and Logo, but we are expanding this to include C and Fast ST Basic.

Keep them coming. We will always publish well written, useful programs which will help or teach your fellow readers. We pay for all submissions, and you'll also get your name in print. Fame at last!

Send your Atari ST queries to: ANDREW BENNETT, Atari ST User, Europe House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

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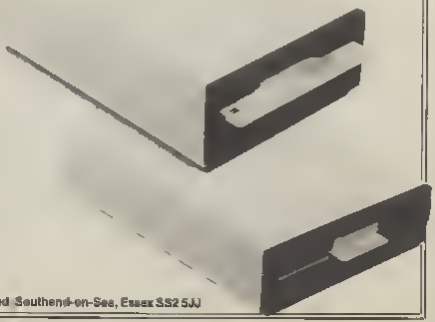
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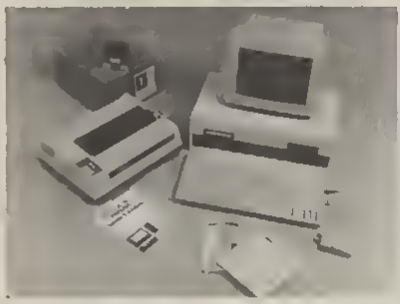
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More desktop extras



Reviewed by Simon Judge

ONE of the great things about Gem is that you can load up to six desk accessories into memory at once. Cornerman is such an accessory, containing 10 different utilities

An *Ascii Table* display 16 characters at a time with their decimal and hexadecimal values and you use conventional sliders to look through the table. Ascii codes are often required during program development but unfortunately editors supplied with some languages are not Gem based thus preventing Cornerman's facilities from being accessed.

The *16 digit calculator* provides three memories, base conversion and operates in binary, octal, decimal or hexadecimal. There is a direct correspondence between the positioning of the calculator's keys and those of the ST's numeric keypad.

To enter the extra characters required for hexadecimal numbers you use the cursor keypad. Above the main display is a reminder of the last four numbers and functions entered which can also be echoed to the printer.

Notepad allows storage of up to 32 767 pages of seven lines each of 32 characters. Facilities provided are to edit, delete, load or save text. Data is saved to a file on disc together with the date and time. However control codes in the file prevent you from using text editors or word processors to edit notepad data.

Dialer is an address/phone directory designed for use with a Hayes compatible auto dial modem. The information is again saved to a file on disc.

Phone Log, used in conjunction with Dialler, records the date, time, person and duration of every phone call. It is assumed that telephone numbers are in the American format of three numbers for the area code, followed by another three for a local area code and four for the number itself.

The *Setup* utility allows you to select how these numbers are interpreted and it is possible to store British numbers although their textual representation in the directory will probably be incorrect with spaces in the wrong places. The Setup utility also allows the RS232 parameters to be changed but the 1200/75 baud rate is a noticeable omission.

Fifteen is an identical puzzle to that found on the Macintosh desktop, involving shifting numbered tiles until they are in numerical order. It is a great novelty when you first use it but I would question its inclusion in a utility suite.

The *Clock* utility produces a small analogue clock which by clicking the full box fills the whole screen. To prevent screen phosphor burn the screen colour changes every minute on a colour monitor and inverts on a monochrome monitor. You can set up a facility so that a password must be entered before the large clock will be removed from the screen, enabling you to conceal what you are working on.

On booting up the system a small rectangle in the top right corner of the screen gives a digital time display in hours and minutes. A minor irritation is the periodic flickering of this rectangle and the mouse pointer but you can disable it.

The *Print* utility allows printing from the files generated by Notepad, Dialler, Phone Log and Setup. You can print all entries, the currently displayed entry or entries between specified dates.

Dos Window allows you to run a non-Gem program from within another program without returning to the desktop. The program must be stored on disc as .COMMAND and have the .PRG, .TOS or .TTP file extension. This facility will allow access to MichTron's Dos Shell program which permits the user to issue commands to the operating system from the keyboard.

Cornerman takes up about 107k on the disc and 175k of ram when installed. The difference

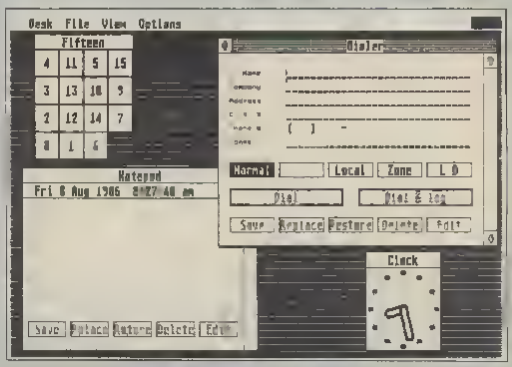


Figure 1 Cornerman's Notepad, Dialer, Fifteen puzzle and Clock



between these two figures represents the workspace required for saving the screen creating a RS232 buffer and for buffering data before it is saved to disc

The memory is claimed when Cornerman is installed rather than dynamically when the utility is used ensuring that the accessory will only be installed if there is enough memory to use all the utilities An exception is the RS232 buffer which is not created if there is insufficient memory In this case a warning is given to the user and the auto dial facility is disabled

The memory constraints become very limiting on 512k machines In 1st Word there isn't enough memory left to run the printer driver program regardless of the size of the document In ST Basic there is only about 25k of free memory Both these examples are with the TOS in rom without which there wouldn't even be enough memory to run Basic

Cornerman can easily be transferred to a start-up disc thus alleviating any disc space problems using the 500k drive The data files for the utilities such as the notepad must also be on this disc.

The limitation of six desk accessories encourages writers to pack as many utilities as possible into one accessory but this means that you cannot separate the utilities and discard the

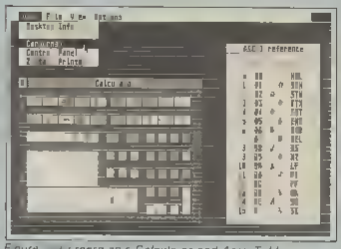


Figure Cornerman's Calculator and Ascii Table

ones you don't need The result is an accessory that is so large that it is not always practical to use it in conjunction with other applications on a standard ST Owners with 1 Mb machines should not have any problems unless they install other accessories such as ram discs and printer spoolers

In conclusion Cornerman is an excellent package – if you can spare the memory! ■

Graphics	9
Easy of use	9
Value for money	8
Overall	8

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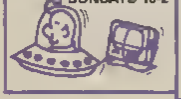
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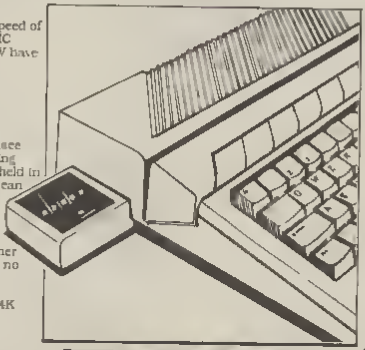
ST CARTRIDGE

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STRUCTURED
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GEM
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COMPARISONS

MACHINE	TIME
IBM AT	6 8
IBM PC	16 8
BBC B	14 8
AMSTRAD	14 7
SINCLAIR QL	15 6
COMMODORE 128	40 1
SPECTRUM	54 8
FAST BASIC	**1.8**

Review

' it positively flies '
' Students of structured programming will be well pleased
Perhaps the most staggering advantage of Fast BASIC over the official lingo concerns using the various facilities offered by GEM
It s a vast improvement on Atari BASIC '

Popular Computing Weekly

Review

The Fast BASIC package provides a complete system for the home programmer the language is beautifully structured
The cartridge spans the gap between high level and low level programming languages and combines some excellent high level structures It seems to have the advantages of languages like C and Pascal, without the restrictions
Bear in mind the fact that the cheapest assembler for the ST costs £39 95, this can only leave you to conclude that Fast BASIC really is phenomenal value for money '

ST User magazine

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ST games – the way ahead

WE tend to take the wealth of games software available on our STs for granted. Howsver, it wasn't always like that. After all, computer software doesn't write itself.

The first games were written by professional programmers during their spare time using the mainframe computers owned by the large corporations or universities where they worked.

They contained very few graphics since most of the mainframes weren't connected to screens their output going to teletype printers. Adventure games were prevalent with the original Colossal Cave and Zork being written during the mid seventies.

The first game with graphics – later to be called Space War – put the player in charge of a simple triangular ship which could be steered around the screen while shooting another ship piloted by a friend.

When Pong or Ping as it was called in the UK was introduced into pubs and clubs in the late seventies the arcade game was born. This of course brought about the arcade craze and such games as Space Invaders. It was in this period that Atari introduced its home computer game which accepted cartridges.

Next came the Atari 400 and 800 8 bit computers which brought about a vast influx of brightly coloured games. Although they would rather not admit it Atari now has a new games winner on its hands in the shape of the ST series. With its minimum 512k of memory and high resolution colour graphics the ST represents the best yet in affordable home game systems.

At present there are some 200 game titles for the ST. Some are simply ST versions of ones which have appeared on older 8 bit machines. Most have been transferred to the ST as is not having been upgraded to take account of the ST's extra memory or better graphics capabilities.

Other games for the ST have been converted from the mono Apple Macintosh. In general these games have taken account of the ST's extra power and memory but have failed to use its colour capabilities.

Just a few games have used the ST's capabilites to greater effect. Three outstanding ones are The Pawn, Psion Chess and the newest release Starglider.

The Pawn, from Rainbird, was one of the first games to be released for the ST. It uses both the ST's colour and memory capabilities to achieve an adventure which has given Infocom a run for its money.

Psion Chess was specially written for 68000 based computers such as the ST. Written by a professional chess machine programmer it represents the best attempt yet at a perfect chess program. You'll find a full review on Page 5.

Also reviewed in this issue is Rainbird's Starglider. Under development for over a year programmer Jeremy San tweaked every line of machine code to get maximum speed.

So much for the present. What will the future bring in the games field? If you had asked that question of Atari 400 owners in 1981 would they have foreseen such famous names as Preppie, Mercenary or Flight Simulator II? I think not. Yet the games titles of 1981 were at the forefront of game design.

Impossible as it is to predict future developments we can get a fair indication of the direction that ST games will take by looking at its capabilities and how they might be exploited by dedicated games programmers in the future.

Some of the features that will be used in the games of the future already exist. Starglider's 18 second burst of digitised music is an indication of how special hardware will be used to produce effects that can then be heard or viewed on a normal ST.

Psion Chess represents how the ST's speed and large amount of memory will be used to produce more intelligent games because they draw upon more and more information before making decisions.

Adventure game writers will also use this to their advantage. Future games will appear more realistic with better graphics more detailed locations and highly intelligent characters.

It will be possible to meet real characters →

By Andrew Bennett



Mercenary: Fourth Voyagen

rather than just hacking them to death. You will be able to make real friends or enemies of these characters who will be far more three dimensional than today's hobbits and robots.

Adventure games will also be much faster than in the past. The ST's large amount of memory means that its games no longer have to pause while more data is brought in from disc.

Infocom's offerings have been updated to be almost completely memory resident and the increase in speed is noticeable to everyone who played their games on 8 bit machines.

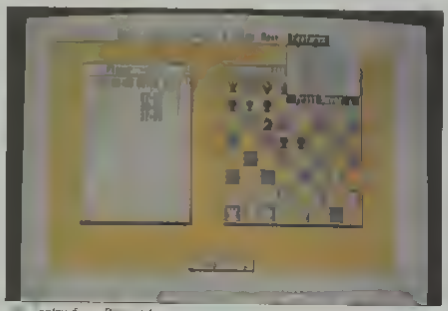
Arcade games will also be much closer to their coin operated counterparts. For example Electronic Arts are about to release a version of Marble Madness for the ST almost indistinguishable from the arcade original.

This is possible because the ST's 320 by 200 16 colour graphics mode matches many of today's arcade machines. Although the resolution is similar to that of many 8 bit machines, the older machines must half their horizontal resolution in order to display more than two colours.

With the system employed on the ST each one of the 64 000 dots on the screen can be any of the 16 colours available, these 16 colours being in turn chosen from the ST's pallette of 512 colours.

And of course the ST's blitter chip, discussed in detail in last month's *Atari ST User*, will make graphics operations much faster than ever before, giving smoother graphic displays.

Overall though, the ST games player today can no more tell what is coming than could his 8 bit counterpart five years ago. We can only sit back, mouse in hand, and wait to see what appears on our monitors – certain that it will be at the forefront of games creation. ■



A display from Psion Chess

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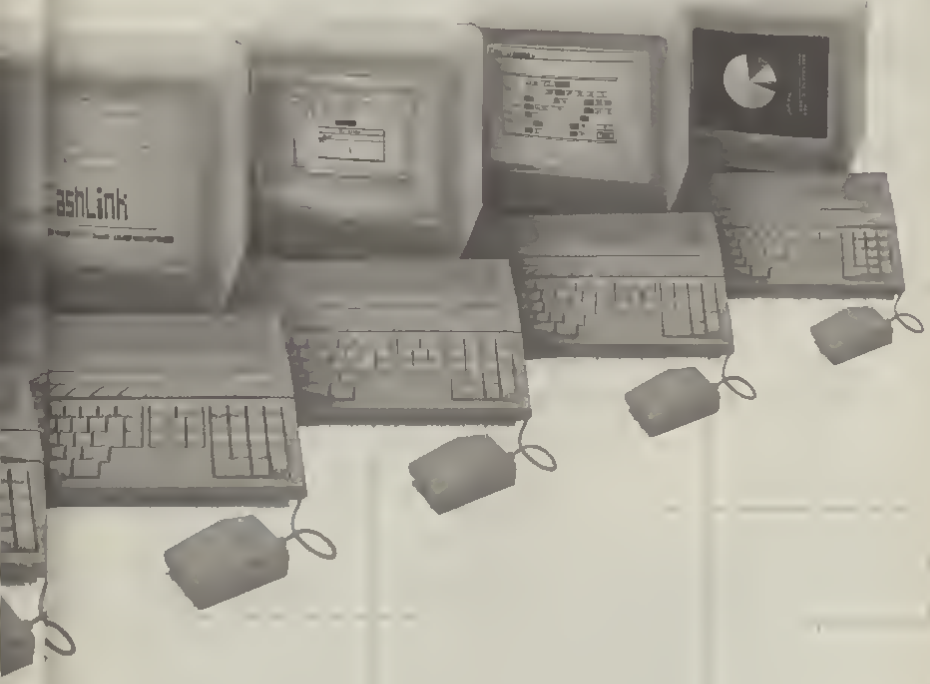
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Graphics format converter

ONE of the most annoying features of the ST is the fact that each of the three graphics modes is stored in memory in a completely different format. This means that pictures created in one mode can't be used in another. Here are two short Basic programs that will convert a low or medium resolution colour picture into a form that can be displayed on a black and white monitor.

Program I converts the colour picture into a quarter size black and white screen. You can use it to try out various settings before you process the picture through the longer, slower Program II which also allows you to set different shades for each colour used.

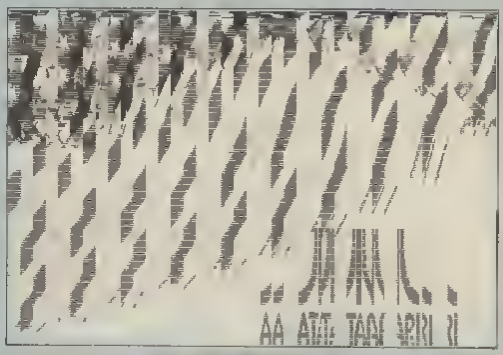
Type in both programs and save them to disc. When you run Program I you will be asked for five pieces of information.

- The picture's name on disc.
- The load offset – the number of bytes at the start of the file before the actual picture data starts. For Neochrome files this number is 128 and for Degas files it is 34.
- The number of planes – two for medium mode picture, four for low resolution.
- The start column – the column where the conversion will begin.
- Reverse or normal.

A quarter screen picture will quickly be produced which will allow you to experiment with the various settings before moving on to Program II.

After you have the various settings as you want them, run Program II. It has one extra prompt – Shading – which allows you to set the type of shading pattern that you require for each colour. Enter four numbers in the range 0 to 5 separated by commas. Some experimentation will be required for the best results.

When the conversion is finished you can type R to load another picture or any other key to save the picture to disc. It will be saved with the extender .MON. ■





Jeffrey Burrows presents a useful graphics utility

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Program I

```
10  REM ****************************
20  ** Super Sprite Editor **
30  ** by Jim Gerrie **
40  ** (c) ANTIC 1986 **
50  ****************************
60  '
70  DIM sprite%(15,15),mask%(15,15)
80  DIM pattern%(15,15),temp%(15,15)
90  DIM pal%(15),rgb%(15,2)
100 DIM pal$(15)
110 '
120 ' Initialize variables
130 '
140 GOSUB 1000
150 '
160 ' Main menu
170 '
180 CLS
190 PRINT "Super Sprite Editor"
200 PRINT
210 PRINT "1. Edit sprite"
220 PRINT "2. Edit mask"
230 PRINT "3. Edit pattern"
240 PRINT "4. Edit palette"
250 PRINT "5. Load sprite"
260 PRINT "6. Save sprite"
270 PRINT "7. Load mask"
280 PRINT "8. Save mask"
290 PRINT "9. Load pattern"
300 PRINT "10. Save pattern"
310 PRINT "11. Load palette"
320 PRINT "12. Save palette"
330 PRINT "13. Quit"
340 PRINT
350 INPUT "Enter your choice: ";choice%
360 ON choice% GOSUB 1100,1200,1300,1400,1500,1600,1700,1800,1900,2000,2100,2200,2300
370 IF choice% <> 13 THEN 160
380 END
```

Program II

```
10  ' Sprite Editor
20  ' by Jim Gerrie
30  ' (c) ANTIC 1986
40  '
50  ' Initialize variables
60  '
70  DIM sprite%(15,15),mask%(15,15),pattern%(15,15),temp%(15,15)
80  DIM pal%(15),rgb%(15,2)
90  DIM pal$(15)
100 '
110 ' Main menu
120 '
130 CLS
140 PRINT "Sprite Editor"
150 PRINT
160 PRINT "1. Edit sprite"
170 PRINT "2. Edit mask"
180 PRINT "3. Edit pattern"
190 PRINT "4. Edit palette"
200 PRINT "5. Load sprite"
210 PRINT "6. Save sprite"
220 PRINT "7. Load mask"
230 PRINT "8. Save mask"
240 PRINT "9. Load pattern"
250 PRINT "10. Save pattern"
260 PRINT "11. Load palette"
270 PRINT "12. Save palette"
280 PRINT "13. Quit"
290 PRINT
300 INPUT "Enter your choice: ";choice%
310 ON choice% GOSUB 1100,1200,1300,1400,1500,1600,1700,1800,1900,2000,2100,2200,2300
320 IF choice% <> 13 THEN 130
330 END
```




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SanTa's tips for Christmas



AS a special Christmas present to all of you who are new to the ST or *Atari ST User*, we include here a selection of hints and tips which will let you use your ST more productively – and hopefully more enjoyably.

★★★

IF you find that memory is running short you can save a few k by erasing some accessories from your boot up disc. The accessories are held in various files that end in the extender .ACC. You can save the memory these would normally use by renaming the ones you don't use very often.

To rename an accessory click once on the file and then select Show Info from the File menu. Now press backspace three times and type in a new extender name for the file. To remind yourself that these files are in fact accessories you should rename them to something like .AC1. If you ever wish to use them as accessories again simply change the extender back to .ACC.

★★★

IF you have a program that you always use when you turn on your ST you can make it auto run by creating a folder called AUTO by using the New Folder option from the File menu. Programs that you place in this folder will automatically be run when you use that disc as the boot disc.

Unfortunately only simple text programs which have little or no graphics can be auto run in this way because the ST runs the contents of its AUTO folder before it has completely initialised itself. You must experiment to see which of your programs will work.

★★★

TAKE very good care of your ST mouse. If you should lose it or if it needs repairing outside its twelve months guarantee a replacement from Atari will cost you a staggering £52!

★★★

POSSIBLY some of you are still using version 1.01 of 1st Word. If so you should take or send your 1st Word disc back to where you bought your ST and have it upgraded to version 1.06. This will fix some of the annoying bugs found in earlier versions. Make sure that you don't have any documents on the disc because they'll be erased.

★★★

YOU might have noticed the Save Desktop option on the Option menu. This lets you save your preferred desktop configuration. Set the desktop up with whichever disc windows you wish to open and place them where you want them to be. Now select Save Desktop and a file called DESKTOP.INF will be saved on to the disc in drive A. Now whenever you boot with that disc in drive A the desktop will be restored exactly as you like it.

★★★

IT IS possible to change the name which appears under the disc icons on the desktop for example to MYDISC. The method is fairly simple. First select disc A by clicking on it once then select Install Disc Drive from the Option menu. You will be presented with the name and letter of the drive.

Move the mouse pointer to the name line and click once. You can now backspace over the name and type in your replacement. Certain characters such as space cannot be used but a little experimentation will show the acceptable characters. When you have finished entering the name don't press Return but click on the Install box and your name will now appear under the icon and will be saved if you save the desktop.

★★★

ALWAYS set the clock using the control panel at the start of a session. Since the time is saved along with the file it will help you to differentiate between different versions of the same file.

★★★

IF you have been opening and closing directories to find a particular file or program you may like to know that you don't have to close the directory window every time you change discs. First open a directory window as normal. Next change the disc in the drive and press Escape once. The new directory will be read in and will replace the old one on the screen.

★★★

THE file selection section of most ST programs is easy to use – simply point at the file that you want and click on OK. The only problem arises when your file is on a different disc from your program. You have to read in the directory of the new disc. This is quite easy. After the file selection box comes up on the screen change the disc in the drive, then click once on the top of the small window which contains the file listing. The new disc's directory will now be read in.

You must always use this method when changing discs as doing it without rereading the directory might lead to your discs becoming corrupted and unusable. ■

By Andrew Bennett

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American $cene

HOT news this month has to be the developments with the Magic Sac cartridge which, at a shade under 150 dollars "makes your ST think like a Mac"

Yes that's right – an Apple Macintosh. You believe it? I didn't until I read all the press releases from Dave Small proprietor of Data Pacific a Denver Colorado firm which seems to be cocking a snook at Apple's Mac copyright.

In case you missed last month's news pages when *Atari User* outlined the Magic Sac the unit plugs into the ST's rom cartridge slot. When you add the twin Mac rom set – not supplied with the unit – it allows you to load and run genuine Macintosh software.

The roms will set you back around $15 (ten pounds in Britain) – if you can persuade your Apple dealer to sell them to you. That shouldn't pose too much of a problem in the UK though as I hear that Robtek (more of which later) has more than 10 000 rom sets just in case.

In the US, two versions of the Magic Sac are available at the time of



writing. Magic Sac 1 sells for $129 while Magic Sac Plus is $149.

Magic Sac 1 consists of a cartridge an ST disc with transfer and other software a Macintosh disc with a transfer program and a manual.

Magic Sac Plus is the more expensive product. It includes an onboard clock calendar with battery back-up to keep time. The clock may be used or paged in from either ST Tos or the Macintosh operating system.

Both systems include a transfer cable to port data across from the Mac to the ST. You plug in the cartridge and rom set and boot the disc up. The cartridge contains around 64k of code which coupled with the 33k disc based program gives you a Mac environment to work in.

The ST's disc format is thus remapped into a ten sector format with 400k storage capacity (as opposed to the nine sectors with 360k normally available on the ST). This pseudo-Mac format is – I am reliably informed – similar to the Macintosh's except for the variable speed rate.

A problem with the Magic Sac is that while the Mac has two serial ports the ST has just one. Thus under the Magic Sac's program environment the modem is assigned to the ST's serial port. Printing is handled via the parallel port – not standard I know but it works.

Dave Small designed the Magic Sac and unveiled it in late '85 at the West Coast Computer Faire. In a conference held on-line in the Compuserve Atari SIG (Special Interest Group) he said that the parallel function was there to support Epson and similar parallel printers that most ST owners had already. Quite rightly Dave's argument was that there is no point in forcing ST owners to invest in serial interfaces for their printers.

During the conference Starglider author Jeramy San raised the interesting question as to whether it would be possible for him to develop a Mac version of Starglider on his ST. Dave Small replied that since Starglider manipulated the ST's screen memory directly and the Mac has a limited cpu running at 5.9Mhz Starglider will run though at a much slower rate. The fact that the ST's screen is 80 bytes wide compared with 64 bytes on the Mac may also cause problems although Dave is working on this.

Dave also made the valid point that Apple may be adopting a tolerant attitude towards the Magic Sac since, if Apple did quash Data Pacific it would be foregoing a whole new generation of Mac enthusiasts.

The Mac has always been a second runner in the American PC stakes. In allowing the ST to run to the Mac standard Apple is insuring against the possibility that there aren't enough Macs in circulation to maintain an effective user base.

Magic Sac suffers from one great disadvantage compared with owning the real thing – Macintosh discs run at variable speeds with data being written proportionally to the disc over all its surface. As every ST owner will know the ST writes its data at the same speed over the whole of the disc surface.

So even though Dave Small's software remaps the disc format in its present configuration the Magic Sac will not run protected Macintosh software. Sadly this rules out wonderful packages such as Jazz, Excel and Pagemaker running on the Magic Sac alone.

All is not lost however as Dave Small committed himself to bringing



out a plug-in and go Macintosh disc drive for the ST by the new year. Once this beast becomes available at Dave's projected price of around the $200 mark – than the ST will really fly.

In fact once Data Pacific starts marketing its ST/Mac conversion kits for $350 (drive and Magic Sac included) we'll see 512k ST/Mac combinations becoming available for around the $900/£600 mark – an interesting situation when one thinks that a 512k Macintosh itself will set you back the better part of £2 000.

As I've said Magic Sac is produced by Dave's Denver-based company Data Pacific for North American consumption. At the time of writing I hear that Robtek – a London-based firm – is planning to manufacture the units under licence. But because of the licencing costs and such I gather that the cost will be around the £150/200 mark. Still even at that price it makes a 2Mb Mac/ST combination available for the same price as a 512k Macintosh. ■

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THE Nexus development system allows you to develop software which can later be placed on to rom or eprom to make an ST cartridge. The system consists of an uncased printed circuit board which plugs into the cartridge slot at the side of the ST.

It contains two Zero Insertion Force (ZIF) sockets to hold roms while programming 64k of static CMOS ram to emulate roms during development and two header sockets which can connect the board into the cartridge address space of another ST

The printed circuit board is quite robust and I have had no problems with it. The disc-based driving software uses Gem to present a very friendly user interface. The documentation – supplied on disc – is of a high standard

The development system is very easy to use – Nexus has gone to a lot of trouble here to make you feel at ease. Having started up the driving program and selected one of the 12 rom types a desktop is displayed with five icons down the left hand side and a dump of the static ram in a window

You can carry out various tasks such as searching for values in a specified range, filling or clearing the static ram and verifying the eproms against the contents of the static ram. Sub-options include the facility to edit the static ram as well as letting you choose how it is to be displayed in the dump window – in byte, word or long word form

From this point programming the eproms becomes quite simple. First a binary image of the eproms must be loaded into the static ram. Then the ram icon, which looks like a male sheep, is dragged to the eprom icon. The Ext. Simulate option allows you to run the eproms on the SIM sockets on the printed circuit board or a program in static ram. You can also choose whether to leave the eproms/static ram enabled when you quit the program

The system has its teething troubles. The software version I was supplied with (1.02) overwrites the last byte of a 64k object file with a $FF byte. This problem can be overcome, but it is annoying and time consuming as is blowing a pair of 32k eproms using the so-called "fast" algorithm. This takes about 20 minutes

Also the development system works best with Intel's eproms. Trying to program units from other manufacturers can prove unreliable

It would be nice if Nexus had allowed the board to take 64k eproms instead of restricting them to the smaller 32k 27256 chips. This means that it takes four eproms to blow a master copy of 128k cartridges such as Fast Basic instead of the two used in the production versions

Having said this, the system is constantly being updated and Nexus gives a very good technical backup for any problems the user may come up against. If you are interested in producing cartridge-based software for your ST this is the product for you ■

By Clive Haynes



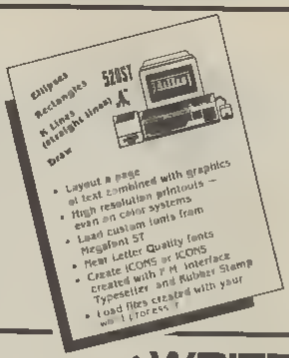
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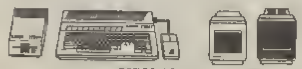
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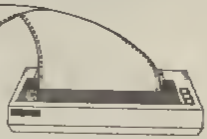
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