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SOFTWARE
SHAKE-UP

Atari promises much more support for programmers

A conversion of the Star Wars coin-op series is promised for the Atari 8 bit by the end of the year.

In something of a coup, Domark has secured the European rights to produce home computer versions of Star Wars itself, plus The Empire Strikes Back and Return of the Jedi.

Atari Inc, holders of the copyright on these games, granted Domark the rights through their licensing company, the International Development Group.

A VERY warm welcome to the first exclusively 8-bit edition of Atari User. Now that our ST fledgling has flown the coop we will be devoting all of our pages to you, the Atari 8-bit owner.

From now on you’ll be able to read even more of your favourite articles, type in more games listings and find out more facts than ever before.

We’ve been looking carefully through your comments on the magazine to date via the recent Reader Survey, and it is encouraging to see how many of you enjoy our balance of features. We’ve got lots of exciting plans for the coming months, including our second birthday in May, but for now we have no less than three great new features starting this issue. Look what we have to offer.

Two of our most popular writers, Len Golding and Stephen Williamson, present the first instalments of their new series - Len’s long awaited tutorial on autobooting your Basic programs, and Steve’s advanced character set editor.

We also take you behind the scenes on the development of one of the most sought after arcade conversions of the year - US Gold’s Gauntlet, the massive Atari arcade hit of 1986. In addition, Brillig’s adventuring column has had a complete face lift and boasts a massive monthly adventure map.

All of our regular features are here as usual, of course, with not just one but two great games this month.

Len Golding’s Gadgets column covers one of the most requested topics from the mailbag - that of how to construct your own printer interface to run a Centronics printer without spending a small fortune on the extra hardware.

André Willey will be continuing to look at the workings of the central input/output system, and this month considers how to add your own data-handlers.

A final word on contributions. If you want to see your own work in Atari User turn to Page 52 for some useful tips on how best to go about it.
Atari 8-bit business booming - Sam Tramiel

A CLAIM that the Atari 8-bit range is coming back to life in a very big way was made by company president Sam Tramiel at the Hanover Show recently.

He singled out Atari's new 8-bit video games machine, the 65XE, as being the new flagship of the games machine range.

"We are particularly happy about the initial response, and now have the financial muscle to ensure that Atari becomes once again the leader in the 8-bit computer world", he said.

Atari is indeed in the best of financial health. The corporation's latest results show a remarkable turn around with sales up 82 per cent.

The major part of this came in the last quarter of 1986 when the company broke all records. In those three months they notched up sales of $92,667,000 against $65,350,000 for the same period in 1985.

The year's sales totalled just over $258 million against almost $142 million, an increase of 81.8 per cent. This left the net income for 1986 at about $23 million.

"We are now in a healthier financial position than Commodore ever was", said Jack Tramiel, the man who built Commodore into a billion dollar company and has now dragged Atari off its knees.

"Our strong performance in 1986 is the result of a resurgence in demand for video games systems and a growing consumer awareness of the value of the rest of our products.

"We are operating from a position of strength now. We are not only virtually debt-free, having paid off everybody, but we have $70 million in the bank", he said.

The introduction of the XE video game system and other major Atari products would drive the company's growth in 1987, said Tramiel.

Software shake-up

From Page 5

claiming, that it has to be a winner.

"We have therefore decided to support the machine. It seems the way to go."

"The demand for our Atari games has actually risen by surprise."

And Mastertronic reports that it is increasing its range of 8-bit products.

"The Atari games we have published have done very well", said a spokesman. We feel happy continuing to support the 8-bit, especially with the arrival of the 65XE".

Pat Bitten of MicroSoft, which has published a conversion for the 8-bit, said that her company was talking to Atari about more games. The situation is "under consideration."

Code Masters' David Darling said conversions for the 8-bit had sold well. "We feel there is a good market in Britain for 8-bit games - and this can lead into the world market", he said.

Publishing drive

ATARI plans to get back into software publishing in a big way. The company believes that British software is equally as good as anything which can be produced in the US.

"We are looking for British programs which we can market around the world", a spokesman said. Star Trek with its digitised sound and impressive graphics was cited as a perfect example of homegrown programming.

Atari is also looking to market British-written business software.

Multiples move Atari's way

STAND by for an Atari explosion in the High Street this year. The company is at an advanced stage of discussions with several leading chains about putting its 8-bit and ST machines on their shelves.

Among the multiples Atari has targeted are W H Smith, Dixons, Boots, Laskys, Comet and Woolworths.

There are plans to test market the ST range at three of them in May and this will be followed by the games machines - the new 65XE, 2600VCS and ever-popular 130XE - in September.

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Atari spokesman Peter Walker said the company is confident it can place its machines in the Big Six multiples, some of which handled its early 8-bit models.

"Negotiations are nearing completion but we don't want to jump the gun by announcing deals before they are fully signed, sealed and delivered"l, he told Atari User.

"The people we are dealing with are well aware that the ST range is a sure seller and that our 8-bit machines have no competition where software availability is concerned".

London

April 24-26

All-in-one package includes return rail fare from anywhere in Britain, accommodation at a leading hotel (including private bathroom and full English breakfast), plus a ticket for a top West End show and entrance to the Atari Computer Show.

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10am-6pm  Friday, April 24
10am-6pm  Saturday, April 25
10am-4pm  Sunday, April 26

Champagne Suite, Novotel, Hammersmith, London

On display for the first time in the UK will be new Atari products that are set to rock the micro world. Star of the show will be Atari's IBM PC compatible, offering a radically new design at a price that will revolutionise the PC marketplace. There, too, will be the latest models in the ST range - the Mega ST workstations. Plus the remarkable Atari laser printer, the machine that has broken the price barrier in desktop publishing.

All of these - along with breakthroughs for the ever-popular 8-bit range and hundreds of new software packages - will be on display at the April Atari Computer Show.

---

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April 24-26, 1987

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From our reader survey we know that many dedicated 8-bit winners also have a strong interest in the exciting new world of 16-bit computing with the Atari ST range. Whether you are thinking of buying an ST, or curious to know much more about Atari’s pioneering role in the 16-bit world, make sure you don’t miss reading your copy of our companion publication, Atari ST User.

The April issue, out now, includes the following features:

- Mac Emulator: We cast a critical eye over the add-on card which turns your ST into a Macintosh – or does it?
- Up to the minute news from the Hanover Fair – including information on the new Mega STs, the Atari PC, the desktop publishing package and all the latest software.
- First part of a fascinating new tutorial series on programming in the Gem environment. This first instalment helps you to make the best use of Alert and File Selector boxes.
- We put CAD-30 to the test in an unusual software test. Is it capable of helping to design the new headquarters for Atari ST User?
- First Word printer drivers explained: At last you can customise the First Word package to make the most of your own type of printer.
- Ascii table accessory. This useful little program for you to type in will create a desk accessory to help to work out those important Ascii codes.
- Software reviews, including The Alternative, Wanderer, Championship Wrestling, Skyfox, and Alternate Reality.
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8 Atari User April 1987
Show features games arcade

A veil of secrecy hangs over Atari's plans for a play-it-yourself games arcade at the coming Atari Computer Show.

More than 20 machines running the latest 8 bit software will be available in the arcade, but the company is remaining tight-lipped as to which games visitors will be able to play.

"We'd like to keep the details under wraps until the last minute", said a spokesman.

Chosen as the UK launch pad for the company's new IBM PC compatible and Mega ST workstations the three-day show opens at London's Novotel in Hammersmith on April 24.

More than 70 exhibitors will be attending the exhibition and many will be unveiling new releases.

Three new games will be available from Red Rat Software - Asteroid, Death Racers and Forbidden Island - all costing £7.95 on tape, £9.95 on disc.

Tynesoft will be offering a range of budget titles on its new MicroValue label, all priced at less than a pound.

The Atari Computer Show takes place at the Novotel, Hammersmith, London from April 24 to 26.

Doors open at 10am each day and close at 6pm on Friday and Saturday, 4pm on Sunday.

A money-saving advance ticket order form can be found on page 7.

Hard disc men fly in

America's leading supplier of hard disc drives for Atari machines is to jet over to London to exhibit at the April show.

The Supra Corporation is to share a stand with its UK distributor, Frontier Software of Harrogate, North Yorkshire.

It will mean that Atari users will get their first opportunity to see Supra's revolutionary 20Mb 8 bit hard disc.

Supplied with MyDOS disc operating system, cables, power supply and interface unit, the drive plugs into the parallel bus at the rear of the 800XL and the 130XE.

Though priced at £799.95 this drive is likely to be much sought after by software writers and developers anxious to capitalise on the boom in the Atari 8 bit market.

Supra is well established in the United States, with its drives currently outselling their counterparts from Atari by a ratio of three to one.

All the drives supplied by Frontier will come with boot and utility programs and carry a 12 month guarantee.

"The Supra range of hard discs bring previously unheard of speed and capacity to the Atari market", says Dave Fields, Frontier's sales manager.

"We are excited about bringing them into the country, where we're sure they'll prove as popular as they are in the States".

Prestel via MicroLink

ATARI comms enthusiasts may soon be able to access Prestel's massive 300,000 page database through MicroLink.

British Telecom is merging the messaging services of Prestel and Telecom Gold, with which MicroLink is associated. This will immediately create a 130,000-strong user base of micro owners able to exchange messages with each other.

Repair service launched

A REPAIR service for owners of 8 bit Atari machines has been launched by Heywood-based company Midcomm.

Offering a professional service and using the latest diagnostic and test equipment available, the company has already attracted customers worldwide.

Says managing director Ian Catherall: "We consider our company to be an extension of the good name of Atari and as such we offer the quality of service they would expect".

April 1987 ATARI USER
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* Supports double, Dual and Single Densities.
* Sector SKEW is now no longer required to obtain Hi-speed as with US Doubles.
* Other Special features are: Slow down, Fast write, Fast read, Drive write lock, Skew on/off, Fast Formatting.
* Fast write with verify. This system is faster than other systems which write without verify.
* A double sided operating system disk is supplied which offers the following:
  IS Doubler, US Doubler, Standard 1050 and Archiver emulation.
  Track tracer, Diagnostic tester, 48k and 128k disk backup utilities.
* The PLATE can be made invisible to software detection by either slow down or 1050 emulation.
* Supplied with detailed information regarding software drive control to allow you to access the full potential of the PLATE.
* Will run all available disk operating systems (DOS) including: Scarcas, Happy Warp speed Dos, and other high speed systems.
* With this system, up to sixteen drives can be connected and used.
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TORPEDO!

By GARY TINSLEY

"ENEMY boats on sonar Captain!"

"OK, Battle stations! Torpedo bay:
Load torpedos... Up periscope..."

Enemy ships have finally invaded our territorial waters, and your
mission is to sink as many as possible.
You are armed with a large number of
deadly high explosive torpedoes but
your mission is limited by the length of
time your air supply will let you
stay submerged.
Can you score enough points to
enable you to be awarded the rank of
Admiral – or will you be thrown out of
the Navy?
Type in the listing, and check it out
with our Get It Right! checksum
routine. When you’re happy with it,
SAVE a copy and then type RUN to
start the game.
Press Select or move your joystick
to choose between the three difficulty
levels. The number on the sub will
show the level number selected. Now
press START or the joystick fire
button to begin the game.
During the game you can press
Start to quit, Option to pause and
Select to return from pause mode.
An extra 40 points are added if a
boat is destroyed in foggy conditions.
The “Air low” warning will sound
to tell you when the game is nearly
over, so hit as many boats as you
can!

WHAT YOU SCORE

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<table>
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<tbody>
<tr>
<td>Boat on the horizon:</td>
<td>25 points</td>
</tr>
<tr>
<td>Boat mid-sea:</td>
<td>15 points</td>
</tr>
<tr>
<td>Boats just off shore:</td>
<td>1 point</td>
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PROGRAM BREAKDOWN

Lines 40-200
Set up player missile graphics,
create the boat shapes, clear sound
registers, change each Graphics 0
line to mode 130 (ANTIC 2 + 128, for
DLIs). The DLI routine and its colours
are POKEd into page 6. This routine
first appeared in Analog magazine and
it enables each screen line of
ANTIC 2 mode (Graphics 0) to be a
different colour, and the text a differen-
t l luminance. Try changing some of
the numbers in lines 133 & 134.

Lines 200-217
Print title screen, check for Start or
fire button to be pressed – also check
for joystick movement or Select to
be pressed for level change.

Lines 230-239
Set air deterioration rate (LV), reset
score and boats hit, choose random
FOG duration, choose initial boat
positions, zero numbers of boats hit.

Lines 240-280
Lines 300-410
Main game loop – adjust air level
ML, check for joystick movement and
move submarine, move boats and
check positions. If boats move off-
screen then reset, check for fire
button and if so fire torpedo. If ML
reaches FOG then darken boat
colours and set fog flag.
Test for a hit – check player collision
registers (PEEK 53263 – 53265) and
if any of these contain 4 then a torpedo
has hit a boat. Add to score, set hi-
score, set score, set boats hit (BT),
set NB1 NB2 NB3, flash screen and
make explosion noise.
Pause routine. Flash GAME HELD
next to STATUS, check for Select to
be pressed (for return), then loop
back to line 70
End of game. Clear screen, disable
dlIs (54286), print score, print
number of boats hit and individual
boats hit, print new rank, make sonar
noise, return to title screen.
Air low warning. Print Air low and
continue with game.
OVER the next three months we'll be explaining how to make your Basic and machine code programs load and run automatically, just like commercial machine code software. We'll start by examining cassette systems, then move on to the various disc techniques.

The most obvious reason for using autoboot files is cosmetic—programs look more professional if they load and run automatically—but they have many other advantages which are less apparent.

You can change the screen colour, alter the margins, set new Tab stops, select lower case letters or insert a flashing cursor, all before the READY prompt appears.

You can load new character sets, ready-drawn screen images, or other large blocks of data before Basic takes control. And the autoboot system is the only way of changing MEMLO, which tells Basic where to find its lowest useable memory.

Re-setting this pointer to a higher value will cordon off an area at the low end of ram which Basic can't touch, and which will be in the same place regardless of the host computer's memory size.

The bad news is that autoboot files must be written in machine code. The entire load and run process happens before Basic gets control, so there's no direct way of autobooting a Basic program. However, it is possible to make a machine code file which initialises Basic then calls and runs a Basic program, and the end result is hard to distinguish from a single-stage autoboot operation. We will be giving you several suitable programs as we go along.

The easiest way of explaining how an autoboot file works is to construct one. Program 1 contains the simplest we can think of—it just changes the screen border to the same colour as the text area and resets MEMLO to protect itself from Basic.

You will need some kind of assembler, such as the Atari Assembler/Editor cartridge, to make it work in this form, of course. Although it's short, it embodies all the features of a cassette autoboot file, so if you can make this work then there's nothing to stop you writing much more interesting routines.

Let's look at the format step by step. The first six bytes (lines 80 to 110) are a header, containing information which the operating system needs to carry out the autoboot process.

The first byte is always zero, though it isn't used by the OS. The second is the file length, in blocks of 128 bytes, rounded up if necessary. Next comes a two-byte address which tells the OS where in ram it has to start loading the file.

Finally the last two bytes hold the initialisation address. Control will pass to this address during power-up, and whenever System Reset is pressed. The rest of the file, from COLDST to FINISH, contains all the machine code instructions which we want carried out before Basic gets control.

Here's how the cassette autoboot system works. When you switch the power on with the Start key held down a single beep tells you to press Play on your cassette recorder, then hit any key. The computer begins by reading the first 128 byte record from tape into the cassette buffer starting at 1021 ($3FD).

It extracts the information from the first six bytes, stores the load address in BOOTOAD 5789 ($242/3), stores the initialisation address in CASINO ($23) and makes a note that it's using a cassette-based program by setting 2 in the BOOTO flag (address 9).

It then copies the entire first record (including the header) from the cassette buffer to the load address and works out how many more blocks are needed, then loads them directly from tape to the load area.

When loading is complete, the OS performs a sequence of jumps to various subroutines. First it does a JSR to BOOTO+6 straight after the header. Because it's a JSR, not a JMP, this section of code must end with an RTS instruction (line 170).

When it returns via the RTS statement the OS checks the 6502 carry flag. If it's set, the autoboot process terminates with an error message, but if it's clear the process can go on to stage two.

This first section must always switch off the cassette motor, clear the carry flag (with a CLC command) and
Return via an RTS.

The second jump is another JSR, this time to the initialisation address, copied from the header and now held in CASINI. In Program 1, initialisation starts at INIT, and this is where we change the screen border colour, starting with the instruction LDA #14B.

Any code between the initialisation address and its RTS instruction will be executed, not only during power up but also whenever System Reset is pressed.

If you want to alter any system pointers, such as MEMLO, you must do it here, otherwise pressing Reset will wipe out all your new values. This "initialisation" section must always exit with an RTS instruction.

The final stage of the boot load depends on whether or not a cartridge is waiting to take control. If so, the OS simply does a JMP to the cartridge start address, usually 40960 ($4000). With Basic installed this produces the familiar READY message.

If no cartridge is present, or if it's a peculiar type that doesn't want to run, the OS will do a JMP to the address contained in a pointer called DOSVEC at 10/11 (SA/B).

During power up the OS sets this to point to the "blackboard" routine — memo pad mode on 400/800 computers, or self-test mode on XL/XE models.

If your autoboat file is a self-contained machine code game, or other program which doesn't need support from a language cartridge, you should change DOSVEC to point to the start of your main code. This may be accomplished during either the stage one or stage two machine code segments.

One way of doing this would be to add the following lines before the final RTS in Program 1:

```
LDA #MAINCODE+255
STA DOSVEC
LDA #MAINCODE+256
STA DOSVEC+1
```

Insert your main program between the final RTS and the label FINISH, and begin it with the label MAINCODE. So long as no cartridge is installed, and internal Basic is switched off the final JMP will now pass control to your machine code program instead of to the blackboard routine.

The OS will repeat steps two and three whenever System Reset is pressed, which means that you could write an entirely new reset routine and the user would never even know about it. We'll show you how to take advantage of this later on.

Now that we know what an autoboat file looks like and how it works, we still have to get it on to tape somehow. This isn't as simple as it sounds, because autoboat files must be saved in binary form, with short inter-record gaps.

No instruction in the repertoire of Basic or the Assembler/Editor cartridge will produce the correct format automatically, so we need a special routine to do it for us.

Program 2 is the one to use if you're working in assembly language. The code up to line 490 is the new save routine. It calls CIO directly to write all the data from HEADER to FINISH directly on to tape. It is important to keep this code separate from the data you want written to tape, so we've put it out of the way in line 6.

The rest of Program 2 is a duplicate...
Autoboot

of Program I. When you have typed everything in, assemble it then enter DEBUG mode and type G 600 to run the machine code at address $800. Set the tape to record and press the Return key and the data will be written to the tape in the correct autoboot format.

If you don't have an assembler, Program III will do virtually the same thing. As the DATA statements contain machine code they must be absolutely correct or your computer will probably lock up - so make sure you save a copy before you try running this program.

Type RUN to start things off, then follow the same procedure. Only the code at lines 150 and 160 will be written to the cassette file. We'll be using this program again next month so keep a copy safely.

To load the resulting file, switch off the computer, rewind the tape and switch on again, holding down START (but not Option). Press Play when the beep sounds and hit any key. After the usual loader delay, you'll hear the aut boot file being loaded, then if all

78 REM Load the program temporarily into the reserved buffer space
79 X=0:RESTORE 150
80 READ 0:IF D=-1 THEN 120
81 POKE BFR(9)+2:X=X+1:GOTO 98
82 REM Now read the data from the temporary buffer into an Autoboot cassette file
83 OPEN #1,B,128,'C:
84 X=USR(1536,BFR,PEEK(BFR+1)*128)
85 END
86 DATA 0,1,6,7,13,7,169,60,141,2,211,26,96,169,141,200,2,169,29
87 DATA 151,251,2,169,7,141,232,2,96,1

Program III

is well the screen colour will change before READY is printed.

As an experiment, try changing the border colour back to its default value by POKE 712,0. Now press System Reset, and you'll see the new colour is restored as the OS performs its JSR through CASIN.

Next month we'll be explaining how to make your own Basic programs into autoboot cassette files.

RICK HANSON

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Crafty plotter

Program: Super 3D Plotter II
Price: £39.95 (disc only)
Supplier: Demon Software, 91 Fleetwood Avenue, Westcliff, Essex SS0 9RE.
Tel: 0702 333307

EVER since I bought my first computer I've always regarded the prospect of 3D imaging on-screen - with the opportunity to rotate the image in any direction and dump it down to printer - as being well beyond my programming capabilities.

Well, with Super 3D Plotter II, I can not only do just that but much more at a fraction of the time and cost it would have taken me.

Disc based, the program auto-boots without Basic. It can display complex drawings in low, medium and high resolutions. Menu driven, the first options enable you to Load or Create.

Luckily the program has plenty of images stored on disc. Until you get used to the complex array of instructions for creating your image, the best way to see what Super 3D Plotter II can do is to load an existing image. Having made your choice another three options are engaged: Display, Edit and Save current image.

Images are loaded into memory in medium resolution mode and can be changed to either low or high resolution at the touch of a button.

The main feature of Super 3D Plotter II is its ability to rotate in any direction. Using a combination of keystrokes, left to right movement can be combined with up and down direction to achieve a really impressive display of bit-mapped graphics.

Each time the image moves all the lines that make up the display change position so as to give the impression of basic animation.

The speed at which your display rotates can be altered and at any time you can freeze the image to take a closer look at the display or dump the screen to printer.

Any image can be viewed in a range of perspectives by using the freeze button selectively, thus allowing the image to continue moving in one direction - say left to right while the up/down movement is frozen.

If you want to get closer to the image, just hit the magnify button until you achieve the desired result. Your image can also be enlarged/reduced and kept in true perspective at the same time.

You can produce hard copies at any time providing you set up the printer control before loading up the main program.

Super 3D Plotter II is automatically configured for Epson and compatibles only, although by adapting the printer configuration file it should work for the 1029 Dot Matrix printer. More comprehensive dumps can be obtained by displaying the image in hi-res mode.

Other useful facilities are screen save, which will save the entire screen in a 62-sector MicroPainter format called Picture.

And if you really want to get creative, you can overlay a screen.

Just think of it - your favourite picture as a background with your 3D image displayed as the foreground.

Further designs can be achieved by image trolleying: Instead of lines being erased and redrawn when your image is moving, you can alter the functions to leave old lines on the screen and still have the computer draw new ones.

Creating images is somewhat harder than controlling a screen display, but a tutorial is written into the manual which eases you into the intricacies of creating your own masterpieces.

There are two methods of data input: The Interactive Graphic Editor lets you use the joystick to define and position coordinates, draw connecting lines and link the whole image into a 3D drawing.

The safest way to plot your designs is to use the old-fashioned system of pencil and graph paper, then either type in the coordinates or move the joystick around the screen until you reach the desired position.

The other method of data input is the Image Data Editor - all the commands are entered from the keyboard. In some respects this method can be easier to use once you understand the philosophy of 3D design.

Whichever method you use there are plenty of commands available to edit and retry positions before saving the image to disc.

Using the joystick input routine I entered the coordinates for the cube image tutorial and within 10 minutes had the design rotating around the screen.

I was surprised at the ease of constructing an image, although the more complex the design, the greater the need to use graph paper and pencil.

The manual is 56 A5 pages printed on yellow paper - an extremely important part of the package. You also get an A5 Help card which outlines the function of each key. All this is packaged in a sturdy plastic box.

In conclusion, I was surprised that such complex images could be so easily produced. The author has obviously put an immense amount of time and effort into this and should be congratulated.

Whether you're a budding graphic artist or just a plain doodler this program wouldn't go amiss in anybody's collection.

Alan Goldsbro

Presentation........6
Graphics............10
Ease of use.........8
Value for money....9
Overall............8
Fuzzy problems

Program: Crumble's Crisis
Price: £7.95 (cassette) £3.95 (disc)
Supplier: Red Rat, 11-15 Fennel Street, Manchester M4 3UD.
Tel: 061 835 1055

THE Director of the Intergalactic Zoo is rather less than pleased with you, Crumble. It seems that you were in charge of closing the zoo last night - and you didn't set the time locks on the Fuzzies' cages properly. During the night they all escaped into the depths of the Multiverse and you are going to have to track them down and recapture them.

To help you get around you'll have a jet-pack - just press the joystick button to fly. That's all you'll need, oh, and a steady hand and a modicum of coordination - these Fuzzies can get into some pretty awkward corners.

Altogether 30 Fuzzies have escaped and you should find six in each of the five levels of the Multiverse. Just go up to them and pop them into your cage, they shouldn't struggle.

You'll be able to see through the bars of the cage how many of the perishes you've caught, so even you won't lose count.

You can always tell a Fuzzy by its mane grin and chortling shoulders, rather like a cross between Dick Dastardly's Muttley and Edward Heath. They aren't actually vicious, but they are rather devious and cunning, so watch your step.

No shirking now, Crumble. Time Lightning starts sparking all over the place if you loiter for too long, so don't get waylaid by any of the rather pretty locations.

If you find you're getting tired, just look for the Energy Packs. One rather important tip, don't touch the walls or ceilings. They're composed of anti-matter and it's pretty bad news if you come into contact with that stuff.

Oh, before you go, you know I said the Fuzzies were basically harmless? Well, there are some rather more unfriendly creatures around, ghosts, goblins, evil weevils and such like. Keep your eyes peeled and don't try catching any for the Director will you?

Right, that's about the lot. It should be enough to keep you busy for a good while, so I don't want to see you again until all 30 Fuzzies are back under lock and key.

Stop complaining Crumble, all that running around through the levels of the Multiverse seems pretty good fun to me - if you don't pop your clogs along the way that is.

More fun than I'm going to have anyway - I've been lumbered with mucking out the Megapotamus' cage while you're away!

Niels Reynolds

Sound ....................... 7
Graphics .................... 8
Playability .................. 9
Value for money ............. 8
Overall ...................... 8

Platform for two

Program: Robot Knight
Price: £7.95 (cassette) £3.95 (disc)
Supplier: Red Rat, 11-15 Fennel Street, Manchester M4 3UD.
Tel: 061 835 1055

As an introduction to Robot Knight you are given a history lesson to explain the task ahead - quite good reading it makes too.

The villain of the piece is Otto. Living in a serene and easy-living Futureworld, he constructed his evil plans for world domination. His plot, however, was uncovered and he was thrown in prison. But it wasn't long before he hatched an escape plan.

Feeling bitter and twisted that his penchant for famine, disease and poverty wasn't appreciated in Futureworld, he resolved to go back to a time where these qualities were a daily fact of life.

This was not Maggie's Britain in the late 20th century, but Europe in the 13th.

Finding an isolated chateau, he built a laboratory in which to perfect the ultimate being, to unleash it on an unsuspecting Futureworld.

So far he's met with only limited success and zombie-like rejects roam the lower reaches of the chateau, deterring all but the most hardy of double glazing salesmen. It is your task to find Otto and destroy him before he perfects the final monster.

You materialise in the chateau and must battle through various dungeons and chambers, past the skeletal zombies and their fireballs, collecting energy packs on the way.

The ultimate goal is Otto's laboratory, where the monster is about to awake.

Essentially a platform game, Robot Knight has a feature which makes the game much more interesting. When starting you have a choice of two knights.

One knight can be used in a one-player game. In a two-player game both are used simultaneously and you can choose to act as allies or enemies.

It is the rather fun two-player option that lifts Robot Knight out from being just another platform game. If you play your computer games with a friend this would be a good buy. If not, I'm sure it's still sufficiently tricky to appeal to some.

Niels Reynolds

Sound ....................... 6
Graphics .................... 7
Playability .................. 8
Value for money ............. 8
Overall ...................... 8
Real high flyer

Program: Tomahawk
Price: £6.95 (cassette), £14.95 (disc), minimum 64K
Supplier: Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.
Tel: 0276 654999

FLIGHT simulators for home computers just can't compare with the real thing, but they can give you some of the flavour, and Tomahawk excels at that.

In fact I am constantly amazed at just how much can be crammed into a 64K, 8 bit computer - regardless of make.

On the Atari, Tomahawk scores very highly. I have read how Tomahawk is jerky and unresponsive on other micros, but I found no such problems with this version.

Tomahawk's presentation immediately reminded me of Digital Integration's other flight simulator, Fighter Pilot. However, while that is strictly an air-to-air fixed-wing simulation for the F15 Eagle, Tomahawk is a simulation of the McDonnell Douglas AH-64A Apache Advanced Attack Helicopter.

As such, it includes both air-to-air and ground attack combat simulations. Although there is no music, sound effects add to the feeling of realism without being too harsh. They include the launching of missiles and gunfire, explosions, engine and rotor whooshes.

The rotor sounds really stand out when the chopper is at rest, after turning off the engines.

You control the machine using a combination of joystick and keyboard input - an optional second joystick doubling as the rudder and collective lever.

Flying, it seems, is relatively straightforward. Pushing forward on the stick both increases speed and reduces the altitude depending on how much angle of attack you have set on the rotors, via the collective lever.

You pull back the stick to gain height and reduce speed, and the automatic stabilizers return you to level flight.

Landing is achieved by reducing lift and pulling back on the stick. You can land with up to 50 knots of forward speed and at -125ft/sec - coming in for a sliding landing on one of the helicopters is demanding, but very rewarding.

You can land anywhere, but you will only be refueled, rearmed and repaired on a friendly helipad.

You are equipped with eight helicopter missiles, 38 2.75in missiles and a 30mm chain gun with 1,200 rounds.

Weapons are aimed and controlled via TADS, the Target-Acquisition and Designation System. The chain gun can knock out an enemy helicopter, but won't even dent a tank.

There are three combat missions, one for training, in which the enemy forces don't return fire.

Mission two involves clearing just four sectors of allied territory of hostile forces. While in mission three you must clear the entire map of enemy forces, and in the fourth you help allied troops push back the enemy front line.

You are also provided with a map, similar to the one used in Fighter Pilot but used to a much better advantage. It is divided into squares which change colour according to their allegiance.

Beacons and helipads are also shown, and facilities exist to help you find these without the map if necessary.

The cockpit display is fairly comprehensive, with a monitor to display targets identified by the TADS computer, which are also coded to help you distinguish between allied and enemy forces.

The normal digital instruments are all there, including attitude, altitude, and rate of climb indicators. There are also meters for power consumption, rotor angle and remaining fuel.

These all take up the lower part of the screen; the map and cockpit window use the top portion.

Colour is generally used to fairly good advantage, although rather lacking in some departments. All the ground is green for instance, and I think a little shading would not have gone amiss.

However, Digital has crammed a lot of features into the simulation. Having flown the RAF's Jaguar simulator which uses three hangars full of relief map and a very expensive hanging camera technique to achieve exceptionally realistic visuals, I can understand the limitations imposed by a 64K home micro.

My only negative comment is that ground features - mountains, buildings and targets - are all line drawings. These are fast to replot, but don't give a very good illusion of height - keep one eye on the altimeter at all times.

Overall, this is one of the best programs I've seen in a long time - it's well worth checking out.

Enough basic flying instructions are included to get you off the ground, and particular attention is paid to the use of the collective lever.

Tomahawk is thoroughly recommended for would-be helicopter pilots.

Rob Anthony

Sound..............6
Graphics............8
Playability.........9
Value for money...9
Overall.............9

April 1987 ATARI USER 19
Thoughtful warfare

Program: Vietnam
Price: £14.99 (disc)
Supplier: US Gold, Units 2/3 Holford Way, Birmingham B6 7AX.
Tel: 021-356 3388

WAR gamers will welcome this latest simulation from those acknowledged experts in the genre, Strategic Simulations. Although it has been available in the USA for about two years, it has only just reached these shores courtesy of US Gold.

The program allows you to re-enact some of the most bitter warfare of modern times. You control the combined US and South Korean forces against the Viet Cong and the North Vietnamese army.

The single display is a message area below a detailed map of the particular terrain where the action takes place. The map can be scrolled in any of the four cardinal directions and is used to move your forces and direct operations.

The documentation refers to the game as NAM (the original US title) and clearly describes the rules for playing. There are six historical scenarios to choose from, each of which can also be played as a non-historical (randomised troop deployment) episode.

Each scenario can take from 15 to 30 turns to play and each turn is divided into 10 consecutive phases. Most of the play involves moving a large square cursor around the map.

In the observation phase, the cursor can be moved on to friendly units to reveal their characteristics (firepower, range, assault factor, movement potential, armory and strength). You can also dig in units in this phase.

Next, artillery and air-strike impact areas are targeted, following which the enemy fires at all your units that are in range and then moves its forces.

After this, your troops can move and fire at the enemy. A second exchange of fire then takes place, followed by the artillery fall phase in which the earlier platted troops are struck.

The final phase shows the comparative state of both sides, with points being gained for the number of units eliminated. A victory indication is also given — questionable, minor, major or decisive. At the end of each complete turn, an opportunity is given to save the game.

The graphics are clear and adequate and sound effects are used to good effect. The simulation is easy to get into and the documentation is both lucid and detailed.

Vietnam is a program that should appeal to the dedicated wargamer and anyone who likes games that require a liberal dose of strategic planning and thinking.

Bob Chappell

Ze fly be on ye turnip

Program: The Archers
Price: £9.99
Supplier: Mosaic, 187 Upper Street, London N1 1RQ.
Tel: 01-226 0628

Rumpy-tumpy-tum-tum,
Rumpy-tumpy-tum-tee,
Rumpy-tumpy-tum-tum,
Rumpy-tiddly-tum.

Oo, arr, me old pals, me old beauties. Now just you put down them there mangel-worzel and harken to old Walter Gabriel ’ere. Mine’s a pint of Shires while you’re up.

Our scriptwriters and them there clever sticks down at Level 9 have gone and taken the story of us everyday country folk, the Archers, and stuck it on one of them new-fangled com-

Buttany machines.

Seems the idea is that you be a trainee scriptwriter and have to plot decisions about four of us loveable folk here at Ambridge: Jack Wooley, Elizabeth Archer, Eddie Grundy and Nelson Gabriel.

Course, if you be going and making decisions that make us folk look as boring as a wet weekend, then them ratings are going to fall.

Spice it up a bit though (watch out, Mrs Perkins!) and them Controller fellows up at the BBC might have something to say. I shouldn’t wonder.

What you get on your TV is a picture and a load of writing, telling you what be going on. Every so often, you must choose from a list of three options as to what to do next.

You don’t have to do any writing yourself — just keep pressing any of those three numbers whenever you be told. Now even old Walter could do that.

Unless it’s the Shires playing tricks (and I’ll have another while you’re about it Jack), seems like I remember this sorta thing from way back in another Mosaic game about a dairy and a moe called Adrian.

Now, me old turnips, don’t go thinking that the game is the same every time you play it cos it baint be so. Like Sid Perks’ Shires (don’t mind if I do, Jack), it’s a little different every time you try it.

The game is as nigh on as big as a haystack and has to be forked into in several parts. The pictures are pretty but don’t know as how I go much on ‘em. Still, you can always turn ‘em off.

Well, me old cabbages, if you be a fan of us old codgers down here in Ambridge, then sure as compost is compost, you going to love this here game.

As for me, I be the only one of the Archers clan I can stand for more than 10 minutes at a time and so would as soon jump in a threshing machine as listen to their doings, whether it be on the crystal set or on a computer machine.

Each to his own tastes, I’s what I say — and speaking of tastes, my glass is empty, Jack, me old beauty.

Brillig

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Each to his own tastes, I’s what I say — and speaking of tastes, my glass is empty, Jack, me old beauty.

Brillig
More than 70 chances to WIN in our exciting MICROPROSE CHALLENGE!

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**2nd prize:** A selection of six of MicroProse's titles, a framed Silent Service poster, plus a T-shirt.

**3rd prize:** A copy of Silent Service, a framed Silent Service poster, plus a T-shirt.

**20 runner up prizes:** A copy of Silent Service, plus a T-shirt.

**50 further prizes:** A Silent Service T-shirt.

The world's leading simulation software company, MicroProse, is offering readers of *Atari User* more than £500 worth of prizes in this easy-to-enter competition.

On offer are all of their top-selling titles for the 8 bit, and prizes centred around the smash hit submarine simulation Silent Service including T-shirts and framed posters which have been specially flown in from the US for the competition.

Other software prizes include F-15 Strike Eagle, a jet fighter simulation and Decision in the Desert, a strategic game which allows you to recreate the battle between Rommel and Montgomery.

### How to enter

All you have to do is make as many words as you can of four letters or more out of MICROPROSE. No plurals, no foreign words and no pronouns please – all words must be in the Oxford English Dictionary.

Then make up a slogan explaining why you enjoy MicroProse simulations, in no more than 25 words.

Send to: MicroProse Competition, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

All entries must be in by April 30.

Number of words found:

(Please list on separate sheet)

"I enjoy MicroProse simulations because . . ."

(Please use a separate sheet – no more than 25 words)

State T-shirt size: □ small □ medium □ large

Preferred format for prize: □ cassette □ disc

Age: ________
ANDRÉ WILLEY meets the US Gold programming team

Bulmer, graphic designer of the team, took me down to the warehouse to see the original Atari arcade machine in action.

I'd often seen crowds of people huddled over these strangely designed machines, but I'd never quite had the nerve to try and play one on my own - it all looked so complex.

However, I quickly found myself getting the hang of it and an hour later I was blessing the fact that the coinbox was deactivated.

Gauntlet has four main characters - the heroes - for you to choose from, each with their own special powers and abilities.

There's Thor the Warrior, very strong, but with no magic powers to speak of, and Thryra the Valkyrie, not so good in combat but with some ability in magic.

If you want real spell-casting power you should select Merlin the Wizard, but don't get him into hand-to-hand combat with one of the nasties. The same applies to Quester the Elf, but what he loses in magic he gains in weaponry.

The characters must find their way around a series of complex dungeons, in which live hoards of deadly ghosts, demons, grunts and other adversaries. They may be shot at, fought hand-to-hand or killed with magic spells which you collect as you travel.

Also in the dungeons are keys to get through locked doors, food and drink to increase your health rating, treasure to boost your score and ghost generators which regularly create more nasties if you don't blow them up in time.

There many other things to collect or destroy, but I'll leave you to find out about them for yourselves...

Often you will need more than one player to complete a level successfully, with perhaps Merlin casting a spell to clear the way for the others to get through a door. He is the only one who can make full use of the magic potions you see, but he is very vulnerable to attack.

Any player may start at any time by dropping a few coins into the slot - there isn't any obvious start and finish to the game. The early stages are certainly easier, but as your skill develops you will find yourself moving into higher and higher levels.

Technically the game is fantastic, with stereo sound and speech and some amazing graphic action controlled by a 68000 processor with 4Mb of ram.

It has two main graphics chips at its disposal - with one, known by the unlikely name of Slapstick, responsible for generating the 24 by 24 pixel sprites in up to 16 colours from a palette of 4096.

The sound effects are generated by a chip with which most of you will be familiar since it is sitting inside your faithful 8 bit Atari.

Gauntlet actually uses a standard Pokey chip to generate its amazing sound, with a separate 6502 keeping track of what it and the dedicated speech chip are up to. The whole thing is then separated out into stereo - but don't ask me how they manage it...

The Atari connection goes still further, because the whole Gauntlet concept was based on an old 8 bit...
Atari APX title called Dandy Dungeons, written by John Palevitch, the man responsible for Deep Blue C, among other things.

Having seen the arcade machine in all its glory we went back to meet the rest of the team. I've already mentioned Kevin Bulmer, the artist of the group, who designed the title graphics, characters, monsters and so on.

Tony Porter developed many of the utility programs used for all versions of the game, and also wrote the Spectrum, Amstrad and MSX versions.

Bill Allen was responsible for the sound and music on all the conversions, and he developed special routines to allow programming to be carried out on a central TDP Pinnacle multi-user system and then downloaded to each machine in turn.

The final member of the team is Bill Mick, who was in charge of the Commodore and Atari 8 bit versions.

Bob was also responsible for developing a special machine code monitor program for the Atari to allow the Pinnacle to transfer its data via the second joystick port – considerably faster than a disk drive could. An entire 22x block of program data could be transferred in about 10 seconds.

Logically enough then, it was Bob who took me through some of the differences between the arcade and home versions of Gauntlet.

The first obvious and necessary alteration is the fact that only two characters can function at a time, as opposed to the original arcade machine's four controller system.

The only home computer capable of working with four joysticks is the Atari 400/800, but it wasn't considered viable to make a special four player version considering the limited number of these still in circulation – not to mention the lack of any more processor time and memory – Gauntlet needs a minimum of 64k to run.

You can, in fact, play a completely solo game, but there's almost no way to get through some of the higher levels without a friend's help.

You can choose your characters at the start of the game, or the second player can start at any other time and the computer will randomly select a persona.

The Atari version loses out somewhat in terms of colour range, and it really shows the lack of a 16 colour high resolution screen on the 8 bit machine.

The team opted for maximum detail rather than colour – the result is a four colour playfield. That said, there is so much going on that you don't really have time to think about graphics or colour – you can be attacked by up to 192 ghosts at once.

Much of the development work for all the home versions was completed on an 8 bit Atari, including the character sets, sprites and title screens.

These were then transferred to the Pinnacle development system for later downloading into the other machines. On the other hand, the game graphics, maps and sound effects were developed on an Amstrad and transferred in the opposite direction.

The arcade game had some 128 dungeons to explore, but you have 512 to work your way through, loaded at random after the first seven standard screens.

This means that no two games are ever likely to be the same, and even if you do somehow manage to get through them all, U.S. Gold will soon be releasing a disc and tape containing another 512 rooms...

Some of these convoluted challenges have been designed by the main programming team, but others have been sent in by players of some of the other home computer versions following the guidelines given with the package.

This kind of interaction with the players is typical of the game, and something which the programmers have encouraged whenever possible.

Gauntlet is almost certainly set to be the best selling 8-bit game of the year, and from what I've seen no gamer's collection will be complete without it.

It combines a frantic arcade shoot-em-up with the strategic importance of obtaining and using the various keys, potions and spells you'll find as you explore. Once you start playing, you won't be able to put it down.

Right then Merlin, where's that amulet got to...
Delving into data transfer

Part 4 of André Willey's series on the Atari's input/output facilities

WE looked last month into the details of the CIO command system, and armed with that information the question I left you with should have been a doodle.

If you remember, I asked you why it wasn't feasible to use the XIO command to perform the Binary Puts and Binary Gets operations from Basic.

There are actually two reasons, both related to the parameters which XIO passes to the operating system. The command number is obviously no problem, but in addition XIO passes three other pieces of information to the values of ICAX1 and ICAX2 (the first two auxiliary bytes) and the address of a string containing the filespec information.

Unfortunately the Binary Put and Get commands need to be supplied with a buffer address, not a filespec address - though at a push that could be overcome by using a long string.

However, XIO has no facility at all to send the length bytes ICBLL/H, without which the binary transfer operations can't function. In fact, XIO actually corrupts any existing values, which means you can't POKE them in beforehand.

Now that we've covered the operation of CIO from the end-user's point of view let's take a look at how the operating system handles the command block we've provided. Perhaps the easiest way to do this would be to follow the OS through the CIOV vector at $E456 and see what happens next.

Firstly, all the operating system has to work with is the value in the register, which tells it which I/O command to use. We've re-printed the table of I/O CB addresses as Figure 1, and let's assume in the example that we are using XCB as at address $350.

The register will therefore contain the values $10 (16 in decimal), which is the offset from the start of the I/O CB tables - 16 on from $340 being $350.

Using the X-register as an offset, the OS now copies all of the relevant information into a special work area in page zero. Known as the Zero page Input/Output Control Block, or ZIOCB, it sits at $20 (32 decimal), and needs to contain the same information as IOC B one did. ICOMM becomes ICOMM2, ICAX1 becomes ICAX2, and so on.

The next thing the OS must decide is just what type of device you want to access - cassette, disc, printer, screen or whatever. It finds this information by checking the buffer address, which in turn points to your filespec string containing the device identifier (C:, D:, P:, S: and so forth).

Once it has this device specifier (for argument's sake, let's say it was P:) it must decide which piece of code is appropriate to handle the data, and where in memory it may be found.

You may remember Figure II from the first part of this series, in which we detailed the various types of device that the OS could access, and it is to this Handler Address Table that the OS goes next.

In fact, it starts looking for the name P: at the end of HATABS rather than the beginning. This rather useful fact means that adding a new handler to take over from an existing one is very easy - you simply tack it on to the end of the list and the OS search will find and use your new entry before it reaches its own original version.

Once the device name has been found the OS knows that the next two bytes will contain an address for the

| HATABS + 0 | P | $E430 | (58415) |
| HATABS + 3 | C | $E440 | (58432) |
| HATABS + 6 | E | $E400 | (58368) |
| HATABS + 9 | S | $E410 | (58384) |
| HATABS + 12 | K | $E420 | (58400) |
| HATABS + 15 | D | $07CB | (1995) |
| HATABS + 18 | R | $226D | (8813) |
| HATABS + 21 | - | $0000 |
| HATABS + 24 | - | $0000 |
| HATABS + 27 | - | $0000 |
| HATABS + 30 | - | $0000 |
| HATABS + 33 | - | $0000 |

NB: Assumes Dos 2.5 and 850 RS-232 handler present. Unused entries are filled with zeros.

Figure II: The Handler Address Table at $31A (794)

Figure 1: I/O CB Start Addresses

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handlers associated with it, as shown in Figure II. In the case of our P: example this would be SE430 (58416) – high inside the machine's rom.

So have we at last found the address of the machine code which will transfer our data to the printer? Well, not quite. What we actually find when we look at $E430 is yet another table.

This one, the Handler Vector Table, contains six two-byte addresses of the machine code routines to be used for each possible command we might have required. These are similar to the commands we talked about last time, and consist of Open, Close, Get Byte(s), Put Byte(s), Get Status, and Special.

The addresses given in the table are in fact one byte lower than the actual beginning of the machine code routines, so if you want to call any of them for yourself don't forget to add one to the location given.

The reason for this is rather complex and involves the 6502 JSR and RTS operations, so unless you want to delve further, it's probably best to take it at face value.

There are five of these vector tables in all — one each for the editor, screen, keyboard, printer and cassette — and each is 16 bytes long. The first is located at SE400 (58368), and then every sixteen bytes thereafter. The first 12 bytes in each table contain the six vectors mentioned, leaving us with four bytes per table so far unused.

The first three of these contain a machine code jump instruction to the initialization code for the device, and the last byte is unused.

The first five commands (Open, Close, Get, Put and Status) are obvious, but the Special vector needs some clarification. This points to the machine code which handles all of the hardware-specific functions of a given device not covered by the normal I/O commands — basically all those operations with an ICCOM number greater than 13.

These include the disc commands (such as Rename, Erase, Protect, Unprotect and so on), the RS232 commands, the screen drawing commands, and anything else that applies to a specific device only.

In some cases — such as our printer example — no extra functions are available, so this command will do nothing but return an error 146 via the Y register — Function not implemented.

Don't forget that when Atari modified the operating system for the XL/XE range it moved a lot of the machine code around in memory.

<table>
<thead>
<tr>
<th>Device</th>
<th>Open</th>
<th>Close</th>
<th>Get</th>
<th>Put</th>
<th>Status</th>
<th>Special</th>
<th>JMP to</th>
</tr>
</thead>
<tbody>
<tr>
<td>$E400</td>
<td>E</td>
<td>F93</td>
<td>F2D</td>
<td>F249</td>
<td>F2A</td>
<td>F1A</td>
<td>F93</td>
</tr>
<tr>
<td>$E410</td>
<td>S</td>
<td>F8D</td>
<td>F2D</td>
<td>F17</td>
<td>F1A</td>
<td>F21</td>
<td>F9A</td>
</tr>
<tr>
<td>$E420</td>
<td>K</td>
<td>F21D</td>
<td>F21D</td>
<td>F2F</td>
<td>F2C</td>
<td>F21D</td>
<td>F9E</td>
</tr>
<tr>
<td>$E430</td>
<td>P</td>
<td>FCE</td>
<td>FF6</td>
<td>FCO</td>
<td>FCEA</td>
<td>FCO</td>
<td>FE9</td>
</tr>
<tr>
<td>$E440</td>
<td>C</td>
<td>FCE5</td>
<td>FDE</td>
<td>FD79</td>
<td>FDB3</td>
<td>FDCB</td>
<td>FCE4</td>
</tr>
</tbody>
</table>

Figure III: The rom based Handler Vector Tables (old 400/800 OS)

Thus, while the rom-based Handler Tables will always be found at the same locations in any Atari, the contents of those tables will be completely different for an XL or XE when compared to those of a 400 or 800.

Figures III and IV show the values in both cases, but should Atari do another major re-write of the OS for a future machine, they could all change again.

You will notice that neither Figure III nor IV contain any vectors for the disc or RS232 handlers. These are both special cases which load themselves into memory from the unit in question.

On disc this handler is the DOS system which you place on your boot disc. It obviously has no rom based vector table, and must supply its own.

When DOS loads it places an entry in the Handler Address Table (HATARS) which points to a similar block of vectors within its own code in ram. Since there is no rule that a vector table must be in rom, we'll be using this same technique next time to add our own device driver.

Now the OS has at last found the actual address of the routine it requires. It does a JSR to the relevant piece of code and the handler itself takes over, looking up the information it needs from the zero-page IOC8.

We won't be going any deeper into the I/O system at this point because here the Serial Input Output system (SIO) takes over in order to pass our data to the peripheral in question.

Once the data transfer is complete the handler updates the information in the ZIODEC, such as modifying the length count to the actual number of bytes transferred and updating the status variable.

All it then needs to do is place the error code back in the Y register and return control to CIO.

CIO now does a little housekeeping of its own. It places the original value back in the X register and moves the modified contents of the ZIODEC back into the calling IOC8 — in our example that would be IOCB.

Finally, before returning to the calling program, it checks the Y register, and if its value is anything other than 1 (1 being the code for no error) it sets the minus flag in the 6502 to indicate that the user should look into the error condition.

So now you know what the operating system gets up to when you do a simple JSR CIOV. The whole operation takes time, of course, but is very flexible indeed.

You can see this time delay for yourself by sending 1000 bytes of data to a disc or tape using multiple PUT commands, and then by using the Binary Put program from last month.

- Have a think about the difference in execution times and see if you can explain it — I'll let you know the answer next month, when we'll begin to put together our own device driver program.

<table>
<thead>
<tr>
<th>Device</th>
<th>Open</th>
<th>Close</th>
<th>Get</th>
<th>Put</th>
<th>Status</th>
<th>Special</th>
<th>JMP to</th>
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<tr>
<td>$E400</td>
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<td>F93</td>
<td>F2D</td>
<td>F249</td>
<td>F2A</td>
<td>F1A</td>
<td>F93</td>
</tr>
<tr>
<td>$E410</td>
<td>S</td>
<td>F8D</td>
<td>F2D</td>
<td>F17</td>
<td>F1A</td>
<td>F21</td>
<td>F9A</td>
</tr>
<tr>
<td>$E420</td>
<td>K</td>
<td>F21D</td>
<td>F21D</td>
<td>F2F</td>
<td>F2C</td>
<td>F21D</td>
<td>F9E</td>
</tr>
<tr>
<td>$E430</td>
<td>P</td>
<td>FCE</td>
<td>FF6</td>
<td>FCO</td>
<td>FCEA</td>
<td>FCO</td>
<td>FE9</td>
</tr>
<tr>
<td>$E440</td>
<td>C</td>
<td>FCE5</td>
<td>FDE</td>
<td>FD79</td>
<td>FDB3</td>
<td>FDCB</td>
<td>FCE4</td>
</tr>
</tbody>
</table>

Figure IV: The rom based Handler Vector Tables (Current XL/XE OS)
MEGA PAC
520 STFM SYSTEM BY A.S.&T.

The new 520 STFM from ATARI has been an instant hit since its announcement. The design has gained from experience with earlier ST and STF machines and includes a powerful and superior engineered computer that will easily find its place in your home as well as in your business.

MEMORY:
The basic 520 STFM has 128K of RAM, an optional 256K of RAM and 512K of RAM. The MEGAPAC 520 STFM has bigger memory — a full ON! MEGAPAC! of RAM, like the 1040 ST!

DISC DRIVES:
The basic 520 STFM has a built-in single-sid ed disc drive. The MEGAPAC 520 STFM comes with two drives, one internal and one external. The latter is double-sided, offering twice the capacity (720K) of the built-in drive (360K). Your disc drive can be uprated by almost half when compared with that of basic 520 STFM users.

PROCESSOR:
The Central Processor unit (CPU) is the Motorola 16-32 bit 68000 Euro running at a clock speed of 8 MHz. It is further enhanced by ATARI's own custom IC providing a Direct Memory Access (DMA) channel for fast data transfer with other peripherals such as the ATARI 510 Winchester drive or the Atari Laser printer (available soon) and a real-time clock.

DISPLAY:
The 520 STFM can display 40x24 characters on any domestic TV or colour monitor such as the Philips CM8533 or the dedicated ATARI SM125 monochrome monitor. Screen is 640x400 pixels or 320x200 pixels, in colour or monochrome, and has 16 colours or a colour monitor TV. The colour palette contains 4096 possible colours. Some ATARI software indeed uses the exceptional display hardware to produce stunning graphics with up to 256 colours at once.

MIDI INTERFACE:
The 520 STFM has 3 programmable sound voices and a Musical Instrument Digital Interface (MIDI) to allow direct connection to a wide range of musical organs and synthesizers such as the Casio CZ-101.

MOUSE:
The 520 STFM has its own dedicated mouse as part of its standard hardware.

PERIPHERAL CONNECTORS:
The 520 STFM can be easily expanded by plugging in "add-ons" through its ports. You will assist printer (Centronics port), modem (RS232C port), musical instruments (MIDI port), scanners (DanaScan port) and fast imaging devices such as network, Winchester, laser printer etc (SCS port).

BUILT-IN SOFTWARE IN ROM:
The MEGAPAC 520 STFM comes with 16K of permanent software in ROM. This constitutes a complete, one disc operating software which is more than the standard 4K computers and other operating systems.

SOFTWARE ON 5 DISCS:
The MEGAPAC 520 STFM comes with 5 discs, containing an impressive collection of software by one standard.

SYSTEM BUILDERS...

ATARI COMPUTERS:
1. 620 STFM computer keyboard, external PSU, 512K RAM
   £260.00
2. 620 STFM computer keyboard, 256K RAM, 320K disc drive, 527K RAM, 5 1/4" disc drive, 5 1/8" disc drive
   £265.00
3. 520 STFM with monochrome (SM125) monitor
   £371.00
4. 520 STFM computer keyboard as above but with
   1 MB RAM
   £39.00
5. 520 STFM with monochrome (SM125) monitor
   £35.00
6. MEGAPAC 520 STFM
   £35.00
7. MEGAPAC 520 STFM with monochrome monitor
   £35.00
8. 1040 STF computer keyboard, internal PSU, internal 1024K disc drive, 1 MB RAM, 3 1/2" disc drive
   £55.00
9. 1040 STF computer keyboard, internal PSU, internal 1024K disc drive, 1 MB RAM, 3 1/2" disc drive
   £55.00
10. MEGAPAC 1040 STF (both double sided drives)
     £55.00
11. MEGAPAC 1040 STF with monochrome monitor
     £74.00

MONITORS:
1. SM125 12" high resolution (600x400) B/W monochrome
   £125.00
2. SC124 12" medium resolution (600x200) colour monitor
   £371.00
3. Philips CM8533-14" medium resolution colour monitor
   £289.00
4. NEC Multiscan 14" colour monitor, can replace SM125 and SC124 and is displayed in monochrome and colour
   £695.00

DISC DRIVES:
1. SF564 single sided disc drive with PSU, 300K
   £135.50
2. SF564 double sided disc drive with PSU, 520K
   £135.50
3. A.S.T. 1000C double sided disc drive for STFM for SF564 with PSU
   £495.00
4. Stand-alone PSU for the above (if required)
   £25.00
5. SF564 with 1000C PSU and SF564
   £189.50
6. A.S.T. 100SC-5", 8", double-sided disc drive, 720K alternative to SF564 with A.S.T. 100SC but with 30" lead switch for IBM PC and compatible drives
   £285.00
7. Stand-alone SF564 for the above (if required)
   £25.00
8. SH 204 - 40 Megabyte hard disc (Winchester)
   £1,149.00

PRINTERS:
1. ATARI 851/840 printer, 30ips
   £199.00
2. STAR NL-10 compatible printer, 120ips in draft mode and 30ips in letter quality
   £269.00
3. STAR RL-16 compatible printer, 120ips wide carriage
   £385.00
4. STAR NL-15 compatible printer, 30ips draft, letter quality
   £39.00
5. U.S. 500 compatible printer, 150ips in draft mode, 60ips in letter quality, £39.00
6. U.S. 500 compatible printer, 165ips in draft mode, 40ips in letter quality, £39.00
7. U.S. 500 compatible printer, 190ips in draft mode, 40ips in letter quality, £39.00
8. U.S. 500 compatible printer, 165ips in draft mode, $39.00

CABERS:
1. Dazzle video leads for Sony or Grundig TV with Euro connector
   £15.00
2. Atari drive leads
   £15.00
3. Printer leads
   £15.00
4. Monitor leads
   £15.00

BABT APPROVED MODEMS:
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   £127.44
2. 10400
   £127.44
3. Factory return software, supports also Prestel
   £49.95
4. SBS Version 2.0 for Bulletin Boards
   £49.95

MIDI INSTRUMENTS:
1. Casio CZ-200
   £299.00
2. East West MIDI software
   £69.96

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A.S.T. MEGAPAC 520STFM is quite simply very good value for money.
We add all the goodies to an already superb computer before you have it. This cuts costs. If for example, more RAM is to be added later to the 520STFM, extra steps will have to be taken such as check-in and check-out of the work will be carried out on a one-off basis. We'll therefore cost more.
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We reserve the right to change prices and specifications.
Software hotline fills the gap

A REVOLUTIONARY support package for business and communications software users which includes membership of MicroLink has been launched by systems consultancy and software design firm Interlex. It will provide previously unavailable support for the lower-priced – generally under £150 – software packages.

In addition, MicroLink will provide Interlex users with the bonus of electronic mail, telex and other communications facilities and databases.

Interlex managing director Mike Lane said: “As the trend toward low cost hardware and software has gathered momentum, the traditional dealer network has moved upmarket.

“Consequently the bulk of new business micro users have been left totally unsupported because the High Street and volume sellers supplying them are not geared up for the task.

“Interlex will fill the vacuum by supplying support at a price the new generation of users can afford.

“Initially this will be provided through a telephone hotline, but we are pushing ahead with plans for an Interlex bulletin board on MicroLink to extend the service to comms users”.

MicroLink on the rates

BRITAIN’S 105-year-old Rating and Valuation Association has taken a giant stride into the 20th Century with the help of MicroLink.

Previously, the professional organisation for property experts in local government and private practice depended on phones and letters to communicate. It didn’t even have telex.

Now its 5,000 members – town hall finance and housing administrators, and chartered surveyors and valuers – will benefit from not only telex, but also electronic mail and Telemessages.

The Association conducts a four year course leading to professional exams, provides an information service, publishes text books, and holds between 70 and 80 conferences a year.

Assistant secretary Julian Price said: “MicroLink will give us the means to speed up our organisational communications, moving documents to and from between our Council members who are located all over the country, contacting our members and exchanging information with our affiliates in the US.

“It will also help us organise our conferences, book hotels and speakers and make travel arrangements for delegates”.

Japan comes to Salop

MICROLINK was the catalyst for language school proprietor Duncan Baker’s latest venture – teaching Japanese to British business people.

The new addition to the curriculum at Lyddbury English Centre in Shropshire developed from a sociable electronic mail exchange on MicroLink.

High peak, low tech in Tibet

ACCORDING to crack mountaineer Chris Bonnington, “it’s only a small trip compared to climbing Everest and I’m looking forward to coming home and getting to grips with MicroLink”.

He was speaking a few days before leaving for Tibet, hoping to add the unconquered peak of Menlungste to his own collection of Himalayan “sclops”.

When he’s not climbing mountains Bonnington can often be found at a computer keyboard writing one of his numerous books and articles or simply mastering the latest micro technology. A self-confessed computer buff, he has joined MicroLink because it will help him organise his expeditions.

“The telex facility will be absolutely invaluable in this respect”, he said. “At present I have to rely on the generosity of my accountant and use his office telex machine if I want to send and receive messages, but obviously this isn’t always convenient for either of us.

“Transmitting text to my publishers is a definite possibility. They are a rather old-fashioned firm, but who knows, I may be able to convert them to Email. As a newcomer to MicroLink I’m also looking forward to exploring its many sections just for the fun of it.

“Unfortunately I won’t be able to use MicroLink to keep in touch with home while I’m in Tibet. Where I’m going is so remote that my messages will have to be carried by runner for three days before they reach the nearest road”.

YOUR chance to join MicroLink – turn to Page 4
By BrilliG

The postbag continues to bulge, and still the greatest number of cries for help are regarding The Payoff. In many shops The Payoff was thrown in as an extra goody with each new Atari micro bought, so this probably accounts for its apparent popularity.

Since I can't hope to answer every query that comes in about it, and also because The Payoff has been around quite a long time I've decided this month to give you a simplified and condensed solution to the whole adventure.

There are many different ways of solving The Payoff, so this solution is just one. Be warned — it does not aim to encompass all the nuances.

It doesn't always tell you what items to drop and when, so you might sometimes find you're carrying too much. However it shouldn't be too hard to work out which items can be disposed of once they've served their purpose.

Also this solution doesn't give all the required directions to get to a given location — you should be able to fill in the gaps here by exploring and referring to your own map as it is built up.

Well, you can't have it all on a plate, you know!

Before I leave The Payoff, you might be amused to hear that Marc Jones of the Wirral, Merseyside shortened the command "Break Window" to "Break Wind" and received the cheeky response, "That's better!"

Now to some more of your worries. Among others, Jason Kirwan of Hackney and Richard Couchlin of Luton are having trouble with the decoder listing in Basic that comes with Level 8's solution sheet to Worm In Paradise.

I have checked the listing and it definitely works, so perhaps you have mistyped part of the listing? Make sure that you haven't mistaken the number 1 for the letter I or zero for the letter O and vice-versa.

Perhaps someone can help Darren Amis of Leicester, who is experiencing a little difficulty with the pyramid in Mordon's Quest and the maze in Adventureland.

Playing the Golden Baton, Mr A S Smith from Havant can't see in the dark hole and is unable to light the oil rag.

K. Rennison wonders how to sur-

---

THE PAYOFF

Read note: Go counter: Place bet: Drop all: Climb pipe: Go up: Get hoist: Go down: Go ledge: Open window: Go window: Go South until you reach the street then Go East: Go tent: Get sledgehammer: Go North, West, North, North: Smash door: Go office: Get ashtray: Rub ashtray: Feel painting: Open safe: Look safe: Get control: Drop sledgehammer: Go to bathroom: Get can, razor, pills: Go to kitchen: Drop hoax: Get gloves and wear them: Go back to tent: Go down: Cut yellow wire: Drop gloves and razor: Go up: Go to newstand: Get newspaper: Go to garage: Go pit: Get bits: Go to costumier: Go East: Climb fence: Drop all: Climb fence and return to office then kitchen: Look fridge: Get meat: Look cupboard: Get treacle: Get hoist: Return to courtyard and climb fence again.


Drill floor: Get umbrella and put it in hole (put umbrella): Open umbrella: Drill floor again: Rig hoist: Go hoist: Drill box (number found on list): Open box: Get gem: Go hoist: Return to storeroom: Go fire door: Down: Climb fence: Go to carpark: Give gem (and receive key): Unlock car: Go car: Get briefcase: Go car park: Go West, West, West, North, North, North and up: Climb gutter: Go down and West: Give briefcase: Voila! The game is finished!
vive underwater in Red Moon.
The Bugblatter Beast from Trial in
Hikers Guide to the Galaxy is
casing Ken White and many others
to come to grief. Some relief is afforded
to all these woes in this month's Hints
' n' Tips section.

Laura Haston of Canterbury has got
a fair way into The Pawn, but needs
to know how to get past the dragon
for maximum points. To the rescue
comes Barnabas Township, of the
romantically named Dick Turpin's
Cottage in Buckinghamshire, whose
solution is given below. (Do any other
readers live at addresses that are par-
ticularly appropriate for adventurers?
if so, let's hear from you).

D. Edwards of Crosby, Liverpool has
written in with the method to get past
the trapdoor in Waxworks. This problem
has been troubling several
readers, among them J.D. Astbury
and G. Bell of Gorton. What you have
to do is go to trapdoor in the roof and
simply Fix Beam. You return and just
walk over it. Easy when you know
how.

The diehard adventurers among
you might be interested in a sample
magazine I've been sent called Adventure
Probe, privately published and
aimed solely at adventure players.

This monthly publication features
reviews, tips, articles, maps and
sundry other adventure-related
material. By the looks of the issue sent
to me, Adventure Probe is well worth
buying. If you're interested in getting a
copy, or taking out a subscription, you
can contact the editor, Sandra Shar-
key, at 78 Merton Road, Highbury,
Wigan, WN3 6AT.

Following my Christmas declaration
of my favourite top twenty adven-
tures, Allan Palmer of Basingstoke
wondered why Infocom's Deadline
wasn't included. He says that although
it is one of Infocom's earlier games, he
still finds it a well-executed imple-
mentation which has paved the way
for greater interaction with other
characters in an adventure.

I'm inclined to agree with him and
think that I must have left it out by
oversight. Of all the whodunnit adven-
tures, Deadline and Suspect are the
best, and the interaction of the player
with the characters is superbly done.

Trouble is, what adventure can I drop
out if I am to substitute Deadline? An
embarrassment of riches, that's the
problem.

While we're on the subject, why not
write in with your own top ten adventure
lists? I'd be fascinated to find out
what other people enjoy playing and
why, and might publish some of the
lists in a future issue.

On the subject of your letters, my
mailbag grows ever larger each
month and although I can't guarantee
a personal reply to everyone, your
chances of getting one are much
improved if you can enclose a stumped self-addressed
envelope with your query.

Brillig can turn base metal into gold,
but unfortunately my local Post Office
steadfastly refuses to take 100 ton
gold nuggets!

Till next time... exciting adven-
turing!

HINTS 'N' TIPS

MORDON'S QUEST

Pyrami proving a pest?
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ABHT IWEIP IWPO LEK AMI

ADVENTURELAND

Stuck in the pits?
"YAW A"YAA SODA GURM OTIS

GOLDEN BATON

Have you got a light, mac?
PMAL LIOR EPER PATE GOTE
LTS OAHT OTTA OMEM TMIW
STSU MUUY

RED MOON

Can't breathe underwater?

LIFELINE

THESE readers would like their
names to be added to the Lifeline
postal contact list:

Allan J. Palmer, 97 Packenham
Road, Basingstoke, Hants RG21
1YA; Adventuereal, Pirate Adven-
ture, Mission Impossible, Voodoo
Castle, The Count, Strange
Odyssey, Mystery Funhouse,
Pyramid Of Doom, Ghost Town,
Savage Island I, Zork 1, Zork II,
Zork III, Deadline.

Andrew Lewis, 26A Hanover
Square, Leeds LS3 1AW; Levels Of
Darkness trilogy, Silicon Dreams
trilogy, Mercenary 1 and 2.

Mr. C. Leighton, 34 Bonnington
Crescent, Sherwood, Nottingham
NG5 3EY; The Price Of Magick, Red
Moon, Lords Of Time, Dungeon
Adventure

GLITCHES OF THE MONTH

Martin Walsh of Ripon has found
two nice glitches in The Pawn. He
has found that it is possible to tear
the paper wall with the immovable
hook in the cupoard. He has also
discovered that although you can't
normally take the pedestal, you can
if you put something on it. Good
work, Martin!

Mr. A. Phule of Berkshire has dis-
covered an amazing hidden
backdoor which, it seems, is
resident in all recent Infocom
adventures. Starting with the
Enchanter trilogy, if you type in
the command SAY LIRPA at the input
prompt, the entire text will be
dumped on to the screen page by
page.

If you have a printer you can
direct the output to it instead by
using the command SAY LOOF,
SAY LOOF LIRPA to dump to both
screen and printer.

This was discovered by using a
machine code disassembler pro-
gram, and it is likely that this Open
Sesame-style code was left in by
the developers to assist with
speedy debugging of returned
faulty or corrupt discs.

Obviously no one playing the
games was ever expected to type
such odd words, so now if you're
really stuck on an Infocom offering
you can virtually find the complete
solution. What a boon for solving
those really tricky puzzles like the
Babel Fish.

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EPSON printers have always been recommended by Atari as an alternative to their own own low-cost and relatively limited machines. But they, together with Epson-compatible types produced by other manufacturers, all suffer from one big disadvantage — you can’t plug them into the Atari’s serial port with your other peripherals.

If you want to drive this kind of printer you will need some form of interface which can send out data in parallel form.

You could pay out £99 for an Atari 850 interface module (plus a further £20 for the printer cable), or about £60 for a third party hardware interface such as the Graphix. Alternatively this software-driven gadget can be built for under £12 complete.

It will handle all printer commands (LPRT, LIST "P", and so on) just like a hardware interface, but it needs no separate power supply and very little can go wrong with it.

The driver program, written entirely in machine code, loads and runs automatically on power-up and it is System Reset proof so you can forget all about it once it’s loaded into ram.

Unlike some commercially available joystick printer interfaces, this one leaves page 6 free and it will work with any language cartridge, including AtariWriter.

Let’s look at the hardware first. You will need two joystick extension cables and a 38-way Centronics-type plug with solder terminals — not the insulation displacement (IDC) type. Test the cables first, using a standard joystick, then cut them to a length of 1.5 metres or less, and discard the socket ends.

Table 1 shows how everything should be connected together to suit Epson and other compatible printers. Remember to link Centronics pin 9 to pin 30 inside the plug.

Soldering this type of connector can be a bit fiddly, and it is a good test of soldering skill. If you don’t fancy doing it yourself you can buy a ready built and tested cable assembly from RH Design for not much more than its component parts would cost.

The software is less than 150 bytes long but is quite complicated to understand, so unless you’re happy with machine code you can ignore programs 1A and 1B, and skip straight to our discussion of the Basic listings.

Still with us? OK, the interface works by inserting a new printer handler which intercepts the normal OS routine and diverts all output to the joystick ports, where it appears in parallel form.

Adding a new handler is fairly straightforward and is being covered in more detail in Andre Willey’s series on using CIO — see page 14.

When the computer is instructed to print a block of data to the printer, CIO sends out one byte at a time via the 6502 Accumulator. Thus at the start of the PUTBYTE routine, register A will contain the next character to be printed, as provided by CIO.

PUTBYTE first checks that the printer is ready to receive data, by looking at the Busy line (STRIG0). If it is high (5 volts) it means the printer is working on some other task, so the routine pauses until STRIG0 goes low again.

Then it checks to see whether the character in register A is an Atari end-of-line (155), and if so translates it into the normal ASCII Carriage Return (code 13). This code instructs the printer to start printing the characters in its buffer and also produces a line

![Table 1: Connecting the joystick leads to the printer’s Centronics plug](image-url)

* Not used unless buffer board fitted
** Connect permanently to ground at pin 30
feed, provided you have selected 'automatic line feed' on its internal DIP switches.

Sending the character to the joystick ports is easy – we just store it at PORTA ($D300), whereupon bits 0 to 3 appear at port one, and bits 4 to 7 at port two, as shown in Table 1.

The printer won’t actually do anything with the data until its strobe line goes low, and here we have a problem. Only eight output lines are available from the two joystick ports, and we need them all to carry an eight-bit character. So what can we connect

the strobe line to?

The answer is that we cheat, by stealing the eighth bit (bit 7) from the character, and connecting it to the Strobe line. Since normal characters use only bits 0 to 6 (ASCII codes 0 to 127), this doesn’t matter for most purposes.

By masking bit 7 on or off we can now send the line high or low at will, without affecting the character data. The printer expects to receive eight-bit characters so we can’t just ignore its Data-B line. Instead we connect it permanently to ground via Centronics pin 30. The printer therefore sees an eight-bit character whose eighth bit is always low.

Back to the source listing, PB1 first makes sure that bit 7 is high, then sends all eight bits to the joystick ports. JSR DELAY wastes about six microseconds, which gives the data lines plenty of time to stabilise, then bit 7 is switched off, sending the strobe line low, and the printer responds by loading the character into its buffer.
After a further six microseconds the strobe line is sent high again, and the routine exits to CIO, using the Y register to indicate a successful data transfer.

This process continues until all the data has been printed, then CIO calls the CLOSE routine and hands control back to Basic, or whatever other language cartridge is installed.

Program 1B shows the alternative initialisation code for the cassette version. It’s different from the disc code because we will be using autoboot format to load the interface program. This ensures that it is invisible to the user, loads rapidly, doesn’t need to occupy page 6, has no worries about memory size and can be used with any language cartridge. Also it looks more professional that way.

In both versions, the code ahead of NEWTAB contains initialisation routines which make sure the program loads correctly into a safe area of ram, and is System Reset proof.

The cassette version uses a standard autoboot format, so the run address is contained in a header, and the Atari’s own boot handler protects the code against System Reset.

More information on autobooting in general is contained in the article on autobooting Basic programs on page 14.

The disc version loads into an AUTORUN.SYS file, which is a lot friendlier and easier to handle than a disc autoboot. With this system the header is different, and extra code is needed to protect the interface program against System Reset.

Also the disc version needs to insert a run address during the load process, and this appears as a footer after FINISH. The code from NEWTAB to FINISH is identical in both versions.

The cassette version loads into ram at $700 (1792 decimal), but the disc version has to leave room for DOS and a few other things, so it starts at $1000 (7424 decimal).

If you have an assembler you can put the program anywhere you like in ram, but once assembled the code is not re-locatable.

That’s the end of our machine code interlude. Basic programmers can re-join us now. Programs II and III are completely self-contained. They need to be RUN just once to create the appropriate autoload file, and can then be discarded.

Bear in mind that machine code has to be typed in absolutely correctly or it will probably lock up the computer. Always be sure to SAVE a temporary copy before you try to RUN it.

For the disc version, insert a disc which doesn’t already contain an AUTORUN.SYS file, then type RUN and hit Return. The file will be created in a few seconds, and it will load and run automatically whenever you switch on with that disc inserted.

To make the cassette version, insert a blank cassette which has been fully rewound, then type RUN and hit
Return. Press Play and Record as usual in response to the two beeps, and hit any key. The file will be written in about 20 seconds.

Whenever you want to load the interface, make sure the tape is fully rewound then switch the computer on while holding down the Start key. XL and XE owners should not hold down Option since you want Basic to be present for programming. Press Play when you hear the single beep then hit any key. When the READY prompt appears on screen your interface is loaded and ready to use.

A word now about Epson-compatible printers. This description generally means that the control codes are identical, or nearly so, to the Epson range, but the internal hardware may be very different. So occasionally you could come across a printer which won't respond correctly to the raw signal from the joystick ports.

This applies mainly to printers which have internal "pull-up" resistors less than about 3 kohms on their data lines. These can stop the output signals going low enough to be recognised as logic 0 by the printer.

Most printers use pull-up resistors of 3.3 kohms or more, and this type should respond correctly. If you happen to be unlucky it's easy enough to get round the problem by using our buffer board (DBP10) to clean up the signals.

Each data line is run through an AND gate, wired as a non-inverting buffer, and this gives an unambiguous logic 1 or logic 0 output. Figure 1 shows the PCB pattern, in case you want to etch your own, but a ready-made is available for $30.50 from "Get It Right". The parts list is:

<table>
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Figure II: Connecting the buffer board into the joystick leads.

Figure I: PCB Foil pattern for printer interface buffer board.
etched and drilled board is available as usual from RH Design.

Figure II shows how to construct the buffer and fit it onto the printer lead. You can dispense with the terminal blocks if you don’t mind wiring directly to the PCB tracks or using vero strips.

A software interface isn’t as versatile as its expensive hardware counterpart, and it does have a few drawbacks. It can’t handle inverse characters, since they use the eighth bit which we have commandeered for the strobe line.

This isn’t a great problem because most machines can’t print inverse characters anyway, but ASCII codes 128 onwards are sometimes used for italics and other special typefaces so you’ll have to sacrifice those facilities.

For the same reason, this interface can’t handle graphic image data correctly. Also it won’t work with commercial autorouters or disc or cassette software, unless that software makes special provision for loading extra code.

However, the simplicity and low cost of this gadget make it attractive despite its limitations. It will handle the majority of home programming tasks, so you may never need to buy a hardware interface.

Even if you are planning ultimately to get an 850 module, it’s worth building this as a stopgap measure, and keeping it as a backup system.

Alternatively you can easily convert the lead for permanent use with an 850 by fitting a 15 pin D-type plug (the 850 manual shows how to wire it). This saves the cost of a new printer cable and leaves you with two joystick plugs which can be used for other gadgets.

Parts required for Buffer Board

- Maplin order code
- 2 74LS08 AND gate chips YF06G
- 2 14 pin DIL IC sockets BL18U
- 1 12 way PCB terminal block (optional) RK47R
- 1 8 way PCB terminal block (optional) RK38R
- 1 Suitable box, eg Vero 301 LL12N

All these parts, or equivalents, are readily available from most suppliers. Cost should be around £1.60 without terminal blocks, or £3.20 with.

1 Printed circuit board (DBP10), available from RH Design, price 95p (plus 25p postage if not ordered with joystick cable assembly).

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Skate Crazy

By MARK RILEY

CAN you survive all six levels of our fast and furious arcade game Skate Crazy? You control a man on a skate board who must manouver his way along a wall while being attacked by various flying objects. The six walls are festooned with combinations of solid and moving blocks and moving conveyor belts, which annoyingly move your man away from the right hand end of the wall.

If you are skilful enough, the man can make use of the sky hook which moves across the top of the screen in the higher levels. It can carry him over blocks and other hazards which would otherwise be impossible.

Can you get a bonus by making it through all six levels? Can you find the hidden cheat mode which will allow you to skip the most difficult levels?

Find out by typing in Listing I. Save the program on to disc or cassette and then test it with our Get It Right! checksum program.

Alternatively, you can download Skate Crazy from MicroLink. Happy skate boarding!
**LANDSCAPE SCROLLER**

from JEFF DAVIES

OUR five liner this month will allow you to use scrolling landscapes for a 3D effect in your games.

The routine produces an effect that has been utilised in a number of commercial games - a landscape scrolling towards the viewer adds a new dimension to the display.

The machine code portion of the program resides in page 6 of memory and sets up a vertical blank interrupt. The vertical blank routine automatically changes the design of the character representing Control-A.

Since the display list has been modified, you should not alter DL-24 onwards.

The Control-A character is changed into a single horizontal bar which is scrolled downwards in its block of character set memory, as shown in Figure 1. The lower quarter of the screen is POKEd with these characters and the 3D effect is achieved.

Some joystick control is possible by altering line 4, but had to be limited to obtain a small program. If the 26th and 27th values in line 4 (50 and 240) are changed to 14 and 208, scrolling is achieved by forward movement of the joystick. The third value in line 6 determines scrolling speed. The higher the value, the slower the scroll.

If you can design a Basic game around this routine, why not send it in for consideration for publication?

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HAVE you ever wanted to create Olde Worlde script to add atmosphere to your adventure? Or design graphics characters for games (the popular wargame Eastern Front uses a map made up entirely from redefined characters)?

Now you can, both quickly and easily, with my Advanced Character Editor (ACE) program - a comprehensive tool for redefining all or part of the Atari character set.

ACE is in three parts. Part 1, the main program section, is listed this month and will run as it stands. It provides a set of basic options for editing characters.

Parts 2 and 3 will be published over the next two months. These sections are in the form of subroutines to be added to the main program. The full three part program uses most of the Atari's available ram, so will only operate on machines with a minimum of 48k.

If you are typing in the listing it is essential to use the exact line numbers as they appear in the listing, as well as entering all REM statement lines, otherwise you may experience problems when adding the next two sections.

When you have typed in the program save it to tape with the command LIST "C:" or to disc with LIST "D:ACE1". Do not use the SAVE command as this will prevent the merging of the other sections with the main program.

List ACE1 to tape or disc before running it. The Character Editor Program POKEs around a lot in the Atari's Operating System - a mistyped POKE could crash the whole machine and ruin all your hard typing work.

Part 2 will add a data command that lists the bit-mapped numbers that represent characters, as well as the facility to save and load character set data to tape, disc or printer for later inclusion in your own programs.

Part 3 is a graphic designer and animator module used to design large shapes made up of more than one redefined character. The animation section is used to create cartoon "movies" and animation sequences.

The Character Editor screen display is split into four sections called Menu, Character Set, Graphics and Pad.

The top of the screen displays the menu of valid commands. The Data, Save, Load, Animate, Colour, and Pad commands are listed in ACE Part 1, but are only used in Parts 2 and 3 of the program. If you try to access any of these commands you will not crash the program but hear a buzzer sound which is used by ACE to indicate that an invalid key has been pressed.

Commands are accessed by pressing a single key, as indicated by the inverse character at the beginning of each option.

The option currently being accessed is highlighted in inverse letters on the menu.

All prompts, information or additional commands associated with each option appear at the right hand side of the menu screen.

To exit an option press the Esc key. There are one or two exceptions to this rule, but they only occur in the Pad and Animation sections.

The next part of the screen display shows the character set. When the program is first run the character set is the standard Atari set which includes letters, numbers, punctuation, graphic symbols and other symbols such as # and +. The display does not include inverse characters.

The one exception to the standard Atari set is the symbol * which has been redefined by the program as a rectangle that acts as a cursor during the Pad module. (In Part 3 of this series). Because of this it is not recommended that you edit this symbol.

ACE supports three text modes - Graphics 0, 1 and 2. The display shows the current character in all three modes. Graphics 0 is the normal text mode on powerup with 40 characters to the line. Graphics 1 and 2 each use larger text on 20 character lines.

Graphics 1 and 2 normally support only 64 characters and exclude the lowercase and graphic symbols.

Because of this, if you choose to edit a symbol excluded from Graphics 1 or 2 then that part of the display will be blank.

Graphics 0 is a one colour mode while Graphics 1 and 2 are colour modes (four character colours and the background). The Graphics 1 and 2 characters are therefore displayed in four colours. A subroutine will be added next month to alter these colours.

The bottom section of the screen display is used in conjunction with the Pad and Animation options (in Part 3) to create multi-character designs and animated sequences.

EDITING COMMANDS

E: EDIT

The Edit command is the default mode, and when exiting from other options the program will return to Edit mode.

The current character is displayed on the right hand side of the Menu screen, with the CHR$ code shown as the AtASCII character code. When the program is first run the current character is A with an AtASCII code of 65. If you use the statement:

PRINT CHR$(65)

then the letter A will be displayed on the screen. The AtASCII code is a slight variation on the normal ASCII codes used by most computers and communications technology.

The SC. Code shown is the screen
code that is associated with the PEEK and POKE commands. If you POKE this number into screen ram the appropriate character will appear. For example, switch on your Atari and type in direct mode:

POKE 40100,33

The letter A will again be displayed on the screen, since address 40100 is a location within the screen ram of a 48k machine.

There is actually another set of codes - the key handler codes - which are used solely by the keyboard handler routines, and are thus not listed here.

The edit grid in the centre of the Menu display is an enlarged version of the current character. A cursor is moved around the grid by the joystick. To edit a character, press the fire button to plot or unplot single pixel blocks on the grid.

Any changes made on the edit grid are reflected in the current character. The standard Atari design for the current character remains fixed on the

menu display but the character as displayed in the character set, the graphics and, if appropriate, the Pad display will be altered.

To change the current character press key E and, when prompted, enter another character by pressing the chosen key. All characters except inverse ones will be accepted, though lowercase and control key graphic characters will not be displayed in Graphics 1 or 2.

F: FETCH
Fetch changes the current character shape to that of another character. For example, if the current character is B, then choosing character C when prompted during the Fetch option makes the shape of character B a duplicate of character C, but leaves character C intact.

I: INVERT
This option inverts the current character.

M: MIRROR
Provides a mirror image of the current character.

R: RESTORE
Restores the current character to the original Atari character set design.

W: WIPE
Clears the edit grid and erases the current character design.

Cursor keys: MOVE
Simply use the cursor keys - without pressing Control or Shift - to move the current character shape one pixel up, down, left or right.

Now you know how to use the basic editor functions you can type in the program and start using it.

Next month we'll be giving you extra routines to allow you to load and save your new character sets, and also to create DATA sets for inclusion within your own Basic programs. Don't forget to order your copy of the May issue now to avoid disappointment.

Full listing starts on Page 48

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- Whatever you send us should be of general interest to other Atari users. You may find a program to tell you when your rabbit needs feeding or use, but it’s doubtful that there will be a mass market for such a piece of software.

- When submitting anything always send both your article and/or program on tape or disk, rather than just on paper. If you have a printer a listed output would be preferable to a typed one. We can’t accept handwritten programs, no matter how good they might be.

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- Avoid using non-standard tape or disk formats such as Dos 3, Spattados or increased baud rate tapes. If there is absolutely no way you can send a disk or tape of your text, you should type it clearly, double spaced on white paper. If your work stands out as being good enough we could then get it transcribed on to computer.

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- Please state clearly that the submission is your own work and that it is being offered for publication in Atari User and has not been previously submitted elsewhere.

- We prefer articles to run to between two and four pages (at about 1,000 words a page, less with diagrams and listings), or to be broken down into separate parts so if they are much longer. Rates are paid per final printed word, not by how much material you actually send, so make your article clear and concise.

- If you are submitting a program you should explain fully how it works, preferably with a rough line-variable breakdown. Point out any problems which may occur during typing, and how they can be overcome.

- Aim to make your programs readable, with plenty of REMs to indicate what is going on. However, never jump to a REM statement, as many people like to leave them out when typing in a listing.

- Try your program out on an unsuspecting friend. This will often throw up a problem you hadn’t even considered.

- Try to avoid graphics and machine code placed in strings. Unless there is no alternative, put your machine code into data statements since Control-key graphics are very hard to enter correctly.

- Above all, remember that your submission should be interesting, informative, useful or fun, and clearly laid out.

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HSV
CAN you mix the GTIA graphics modes, such as modes 9 and 11, on one screen? This is a problem to me, as they all have the same Display List code – 15.

Do I have to use a Display List interrupt to change modes, and if so what location do I have to write to to tell Antic that I have changed modes?

I am looking for a mixed mode display like the one in Technicolour Dream. – Paul Gower, Littlehampton, West Sussex.

As you have correctly guessed, the GTIA modes are all represented by the same Display List number – that for a Graphics 8 line.

The change in mode is effected by using location 623. If this is zero the screen will show as Graphics 8. If you POKE it with 64 you will get a Graphics 9 screen, 128 will give Graphics 10 and 192 gives Graphics 11.

This address is a ‘shadow’ location, meaning that its value is read 50 times a second by the OS and placed into the relevant hardware register.

This means that the mode will only change between successive TV frames, thus avoiding messy glitches in the display.

To change the display “on the fly”, as you want to do, you must obviously use the hardware register direct – you want to alter the mode more often than 50 times a second.

This register is located at 53275 (SD01B), and takes the same range of values.

You can alter it during a DLI if you wish, generating the kind of mixed mode screen you want.

Don’t forget that the OS will place the shadow value from 623 into this hardware register during the Vertical Blank, so each screen will begin with the mode specified in 623 until it reaches your DLI.

Broken joysticks

DO you know anyone that sells spare parts for joysticks? I have had a number of these and it seems to be the same part that goes on all of them. It’s a shame to throw a joystick away if it can be repaired.

I would also like to know if any readers have had the same problem as me in trying to join the US. Gold club. I wrote to the address given on one of the games twice, but have never had a reply.

It seems a complete waste of time to join the club if they aren’t going to bother to reply to your letters. – J.J. Smith, Leeds.

Atari used to sell joystick repair kits, but we don’t think that they are available any more.

Try contacting either Atari or one of their service centres for the part you require, which we suspect is the white plastic insert which goes between the stick itself and the printed circuit board.

Have you tried phoning US. Gold about their seeming lack of response? If you haven’t had any return for your 90p a quick phone call may well sort the problems out.

Thwarting cousins...

I HAVE written my own text adventure game. To load it I use the CLOAD command. When my cousin comes round, he likes to play my games but he can list the program and change everything, which annoys me.

I would like to load my games using the Start and Option keys so that they will autorun.

You have printed a program in your February 1987 issue which makes autorun useless. I wondered if you could print one for the running cassettes? – Garry Hedges, Corringham, Essex.

To restore family peace in Essex, just take a look at page 14. This is the first of a three part series tackling exactly the problem you outline.

You could also encode the data in your adventure programs so that your cousin won’t be able to alter them so easily. Computers have whole programs using the methods described in André Willey’s article in the August 1985 Atari User.

Assembly snags

I AM learning assembly language, and surprisingly finding it not as difficult as I thought. However, there are a few things which I don’t understand. For example:

256 LDA #0
260 LDY #0
300 LOOP STA (CURP), Y
310 DEY
320 BNE LOOP

These few lines were taken from a program which clears several pages of memory. Could you please explain line 300? Also the Y register is decremented below zero, so how will this clear 256 locations?

Lastly, how about a series on advanced sound techniques. All your topics covering Atari Computers have been excellent, but you only covered sound very briefly in the early issues.


If you used the command
STA 710 the contents of the A register are stored at memory location 710.
You could, of course, replace this number 710 with a label, such as COLBAK for example. Thus, STA COLBAK could mean the same as STA 710.
The STA command can be modified in a number of ways, and indexing – which you mention – is just one of them.
This simply means that before the store command is executed, the value in the Y register is added to the address you’ve given.
If Y contained the number 10, for example, then STA COLBAK,Y would mean store the A register in location 720 – or 710 plus 10.
In the case you mention, Y is set to a value of zero, and as it can only contain numbers between 0 and 255 it must become 255 when it is decremented by one with the DEY command.
This means that the page of memory is cleared in the order 0, 255, 254, 253 and so on until Y is zero again and the program drops out of the loop at the “Branch if Not Equal to zero” (BNE) statement.
In this particular case, the address CURPAG is enclosed in brackets, which simply means that the location CURPAG itself contains a further address which the command will then use.
If we tried it with our COLBAK example, then the A register would not be stored in location 710, but rather in an address given at location 710.
If 710 contained the address $1000, for example, then that location would have the value of A stored in it.
Don’t forget that addresses are always stored in two bytes using the 6502’s normal lo-hi format, so both CURPAG and CURPAG+1 will contain part of the address value to use.
Thanks for the book suggestion. Now that we have more editorial space, we’ll certainly look into the possibility of running more articles on sound commands.

Freezing colour
I HAVE just bought an Atari 800XL and I am not sure how to stop the colours from changing when I leave the machine alone for a while.
I am also looking for a program to store names and addresses along with phone numbers. Is such a program available on cassette? – J.J. Colquhoun, Aldershot, Hants.
◆ The colour change you mention is a feature called Attract Mode, and can be halted by pressing any key.
The database is more difficult, as there aren’t any such items on cassette – mainly because the cassette system is too slow to make the idea really feasible.
That said, keep looking through the small ads in Atari User and other publications in case some enterprising programmer devises one.

Pictures off screen
I HAVE an Atari 800XL and a 1029 printer. Please could you tell me how to take screen shots or to make screen dumps.
I have tried taking pictures of games from the TV, but it never works as there is always a reflection when I use a flash and it’s too dark if I don’t use a flash. – Neil Richardson, Camberley, Surrey.
◆ You can do screen dumps onto a 1029, but most of the programs that enable this (including the one we published in the September 1986 issue) work from BASIC, and thus are only useful to dump your own screens and pictures.
Your best bet if you want to record your high scores, or just take pictures of the game screens to study at your leisure, is to take screen photographs. These can work very well (as you can see from our games review section), but you must follow a few simple rules.
Firstly, don’t use a flash – you want to capture the image on the screen, not the pane of glass in front of it.
Secondly, remove as much outside light as possible. This means closing all the curtains and turning off all the lights.
Set up your camera on a tripod or a steady table top and line up the TV screen in the centre. Try to keep your camera the same height as the TV set and square on to the screen.
If you can freeze the game screen you should use an exposure time of between half a second and a second, but if you can’t you must try to use a time of 1/15th, or better still 1/25th if your camera has that speed.
Adjust the exposure (f-stop) according to the camera’s light meter, or leave it on automatic.
Once you’ve done all that, focus the camera accurately and use a cable release to avoid any camera shake when you take the picture. You will find that practice quickly makes perfect.

Monthly discs
I HAVE noticed that you no longer advertise or indeed supply discs or cassettes of programs published in Atari User. I don’t subscribe to MicroLink as I cannot afford a modem at present.
Is there any way that I might obtain the discs? I am tired of typing! – H.Cowell, Hemel Hempstead, Herts.
◆ We stopped producing the monthly discs and tapes because there was not enough demand for them. We might consider bringing them back if enough of you write in and ask for them. What do other readers think?

Printemps comparison
I WILL hopefully be getting a printer soon. Could you tell me the difference between the 1029 and 1027 printers?
Also I would like to congratulate you on Atari User. I haven’t missed one issue. – Andrew Follows, Hassocks, Sussex.
◆ The 1029 is a dot matrix machine, which means that its characters are made up of lots of tiny dots. The 1027, on the other hand, is a letter quality printer which works more like a typewriter – its characters are printed by an impact barrel.
The 1027 is great for sending correspondence, but is very slow (about 10 characters a second), while the 1029 is much faster but has a much poorer text quality. Also the 1025 can print graphics, which the 1027 can’t.
YOUR HINTS AND TIPS

CHIMERA

I THINK I can help James Kelly of Settle, who had a problem with the game Chimera where he was not able to open the doors.

It's quite easy. After having disposed of the first warhead you must guide the robot down the two parallel passages leading in a long straight line downwards, past the hourglass in a grey room. You will eventually reach a wall at the bottom with a toaster blocking an entrance in it. Follow the passageway around until you get to a gap joining the two parallel passages.

There, if you have not already eaten it, you will find a loaf of bread. Take the loaf (do not eat it) and make your way back to the toaster.

Stand against the toaster and eliminate it. In the toaster's place a life-saving drink will appear. Leave this and carry on along the passage until you come to another toaster. Eliminate it and this time press the button to eat the bread. Take and drink the life-saving drink that appears there.

Go back to the other life-saving drink and drink it. Enter the room and you will find a key, with which you can eliminate all four doors.

When you have finished with the key the second warhead can be made by taking the key to the padlock and picking up the padlock. It must then be taken to one of the four blue rooms.

Robert Lane, Chaddesden, Derby.

CRYSTAL RAIDER

I DISCOVERED a trick when playing Crystal Raider. If you hold down the joystick button and press Start, you can go round the screens and plan your route without getting killed by the nasties. — Mark Hodge, Slough, Berkshire.

STARQUAKE

I THOUGHT that your readers might be interested in the following game tips.

The nearest teleport to the planet's core in Starquake is called Whole. If a key-shaped object can be found, it will allow Blob to open the vertical doors.

The credit card allows Blob to enter Cheep's pyramid and also allows access to part of the game beyond the security doors.

Many people seem to be stuck at the point in Medium where the skeletal horse appears, but I have finally made it past this screen.

The exact solution is almost impossible to explain, but it involves a lot of doubling back and moving downwards, until a horse is lined up correctly with the tree.

Here are some spells to help those stuck in Scrolls of Abaddon:

Walk: Allows the player to walk against the arrows.
Ice: Freezes the nasties momentarily.
Resurrection: This will give one extra life when the "game over" message is displayed.
Sparks: This surrounds the player with an energy field which is fatal to the nasties.

Flight: Jump to the next level.
Vlssa: Highlights the magic discs.
Mappa: Type this then press the space bar to view the map of the whole area. — Danny Platt, Bolton, Lancs.

MERCENARY

I HAVE just been playing Mercenary on my 800XL. I went into the elevator cage at 9:05, got the poweramp and went through a two-way transporter and arrived in a yellow hangar with two doors.

I went through the transporter again, went back to the hangar and took off. I then took the gold to the exchequer and got a big reward.

Then I had a look around in the desert outside the city and found an elevator cage with a craft inside. I kept the poweramp and went E90 in the air.

After 105,000 feet on the altimeter it wouldn't go any higher. Did I escape from Targ? — Andrew Whittock, Preston, Lancs.

Function keys

FOR some months now I have been reading your excellent magazine and whereas I am finding it very helpful and full of information, I have one slight criticism.

The space dedicated to 8 bit users appears to be being slowly eroded by the ST section. I know that this is also a concern of other 8 bit users who subscribe to Atari User.

I am also having problems programming the function keys on the 130XE. According to the Silica Shop literature, this is possible. Can you help? — J. Hayes, Borehamwood, Herts.

As you can see, Atari ST User has this month become a separate magazine, following an overwhelming response from both ST and 8 bit owners who filled in the survey which we printed in February.

We hope that you enjoy the new Atari User and Atari ST User magazines.

As for the function keys, you can check for the Start, Select and Option keys by PEEKing location 53279 (6D1F). You will find a number between 0 and 7 here, with 7 meaning no buttons pressed and 0 all buttons.

Bit 0 represents the Start button, bit 1 the Select and bit 2 the Option. Thus the combinations are as follows:

0 Start, Select and Option
1 Select and Option
2 Start and Option
3 Option
4 Start and Select
5 Select
6 Start
7 None

The Help key on XL and XE machines can be read by PEEKing 732 (2D2C). A value of 17 means Help has been pressed, 81 means Shift + Help and 145 means Control + Help.

As this register holds the last pressed value, you must clear it after checking it by using POKE 732, 0.

Cartridge software

ON the 800XL, what is the cartridge slot for? Can it be used for games? — R.K. Bond, Borehamwood.

Cartridges have always been an alternative way for developers to provide soft-
ware for micros. They simply contain programs in rom form rather than on disc or tape.

In fact, on the old Atari 800 there were two cartridge slots, but as this extra slot was rarely used the more recent machines have had only one.

Rom cartridges have the advantage of loading instantly and being almost indestructible. However they are more expensive to produce.

Most of the early games came on cartridge, including PacMan, Star Raiders, Missile Command, Donkey Kong – plus such things as AtariWriter, Logo, Action! and Basic XE.

Recently the cost has proved prohibitive for many games companies, but with the 65XE on the horizon we may once again see an upsurge of cartridge based software.

**Speedy service**

HOW about this for service? Friday afternoon January 23 I sent for a copy of BMX Simulator for my Atari 800XL from Miles Better Software.

Imagine my surprise when there it was first post Monday morning January 26th! I expected to wait at least week. Incidentally, BMX Simulator is excellent. – B.G. King, Christchurch, Dorset.

**Compilations please**

WHILE browsing through some very old PCWs I found a Dragon listing in a 1984 issue by one of your, in my opinion, best software reviewers – Bob Chappell. You are forgiven, Mr. Chappell, if this was indeed you!

Why not release a compilation tape and disc with all the best programs from Atari User back issues?

Finally, do you or anyone else know where I can buy copies of Thank God it’s Friday and Shamus II in the U.K.? – Mark Kernaghan, Nottingham.

We all have a history in this industry and Bob’s no exception – whether he tries to live it down or not we aren’t quite sure. At least he has good number of years of experience at his keyboard.

What do other readers think of the compilation idea, then?

Shamus II will be out on the American label, and look around for an old Synapse import copy. As for the other title, we’re not too sure whether it has been released on the Atari. Can any other readers help?

**PAL is no friend in the USA**

I JUST wanted to write and let you know that I think your magazine is excellent.

I have family in Great Britain, so I have them keeping an eye out for anything to do with Atari. I was very excited when I received my first copy of Atari User – Volume 1, issue 6.

After looking at your magazine I knew that I had to see more. I now have a copy of every issue, and I have also started a friend receiving your publication, and we have also shared our copies with other users. In fact, Atari User is fast becoming an American favourite.

I have recently visited Great Britain and was a bit disappointed in the availability of Atari software and magazines, but although I must admit that things are not much better in the States.

I did notice that there are imported American Atari magazines available – do you ever plan on Atari User being available in the United States?

I have experienced a problem with some British software that I bought, and was wondering if you might be able to offer any help or suggestions.

I own an 800, and the programs that I have been having problems with are Zone-X and One Man and His Droid.

They both look like good games, and when I load them the title screens are fine – but when I try to play them the graphics bounce up and down, making play impossible.

We have tried them on other Ataris but experience the same problem. A friend suggested that the problem is within our television system, rather than in the games themselves.

Otherwise, we have found British software for the most part to be of excellent quality.

I especially enjoy your software reviews and the amount of space you provide for readers letters in the mailbox section. Thank you, Atari User, and please don’t ever outgrow us dedicated 8 bit users. – Raymond D. Swan, USA.

It’s nice to hear from our overseas readers – keep on enjoying the magazine.

Your problem with the tapes is almost certainly to do with the TV system you use. Some American games don’t run over here correctly, so the reverse is bound to also be true.

The problem is that in the UK we use a system called PAL which has 50 frames per second with 625 lines per frame.

You use NTSC, which has 60 frames per second, but with only 525 lines.

Thus, although the amount of information displayed per second is roughly the same, any program which relies on the 50 Hz timing signal will work at a different speed in America – and sometimes it won’t work at all if the timing is a critical part of the program.

**Keep your secrets**

HERE’S a way of disguising your disc files to prevent unauthorised access.

You first have to modify the DOS.SYS file so that you can use control characters in your filenames, then you simply include the Clear Screen and the printer Cancel Line codes in your file name.

First, boot your Dos disc with Basic and then use: POKE 3818.0, POKE 3822,127

You may now save the modified version typing DOS, then using 1 for format disc and H to write out the new Dos files.

With the new Dos installed, load the file you want to protect and save it using a file name that ends with CHRS(125) and CHRS(24). These characters may be produced by Esc/Shift+Clear and Control+X.

* Type DOS then A and two Returns and see what happens – amusing isn’t it? If you have a printer then type *+P when asked for the file spec information. Then just watch your printer churn out sector sizes but nothing else for your protected files.

* You can still load the files
in the normal way yourself, so long as you use the filenames complete with the control characters – so keep a note of the names handy.

You can’t alter the file names DOS.SYS, DUP.SYS or AUTORUN.SYS as those are special names that the disc system recognises.

It should be possible to modify other versions of Dos, but the POKEs will probably be different. – David Golding, Harrogate, North Yorkshire.

Port pin outputs

PLEASE could you help me by printing the diagrams for the pin outputs on the Atari 800XL I/O ports? – Neil Richardson, Camberley, Surrey.

Although we have answered this one before, we still get a lot of people asking about these connections. You should have been keeping up with your back issues, because we have covered this issue in the gadgets series. However, just for you, here are the pin-outs one more time:

Cartridge capers

IN REPLY to L.P. Arnold’s letter in the March issue of Atari User concerning software compatibility, I recently upgraded my 800XL (which cost £169 – yes, a victim who bought it 10 days before Atari slashed their prices) to a 130XE (which cost £55 brand new).

I had had no problems with cassettes or discs, but I have had problems with cartridges. Atari’s own fit OK, but I also have Carnival Massacre on rom from Creative Sparks, and this will not fit in the cartridge port.

I would therefore imagine that most if not all Creative Sparks cartridges will be manufactured to the same specifications, and therefore will not fit. I don’t know if any other third party cartridges have this problem or not.

Luckily, after visiting the Christmas Atari User Show and discussing this with a representative from Atari, he suggested removing some of the plastic casing which I did and the cartridge now fits.

However, I cannot understand why Atari changed the location of the cartridge socket on the XE machine. It would be much better above the keyboard as in the XL model.

Finally, what is the best method for cleaning the drive head in a disc drive – are the special cleaning discs available any good, or should I get it serviced by a reputable dealer? – N. Henderson, Worksop, Notts.

Tackling your cartridge problem first, the casings of the Creative Sparks cartridges are slightly larger than most, certainly, and Atari’s suggestion is one way around the problem.

However, all Creative Sparks software is now available on budget cassette rather than cartridge, so you shouldn’t have any further problems.

As you say, the port is very inconvenient on the XE, and we can only assume that this was done to clean up the design of the machine – and to make it a little bit cheaper to produce.

Cleaning drive heads is not the easiest job in the world, but the “wet” type of cleaning disc would be best. Otherwise, drop it back into a dealer who can do a full service at the same time.

Computer courses

I WAS reading in the March issue of Atari User about the Hampshire man, Mr. Roy Goring, who is running a computer correspondence course.

I have a daughter who is eleven years old and I would like her to have lessons in programming her Atari 800XL computer. She has had it 14 months now, and has certainly not programmed it to its full extent.

She has tried to type in some of the programs from your magazine but has not had a lot of success. If possible, could you please let us know Mr. Goring’s address so I could write to him about a possible course for her?

Also, we have bought your magazine since January 1986 but we get it delivered from our local newsagent. Does this qualify us as an Atari User subscriber, and thus for the special reader offers? – Robert Courtney, Thongsbridge, Huddersfield.

Roy Goring can be contacted at RJG Programming, Brockhampton Road, Havant, PO9 1NT. Tel. 0705 451214. He should be able to help you out with your typing problems too.

Unfortunately, the special offers are only available with our subscription orders, so you don’t qualify at the moment.

That said, if you compare the cost of subscribing with the cost of ordering each issue from a newsagent, you will find you have been paying more for each issue than you needed. Subscription copies can also arrive up to a week before many newsagents have theirs on the shelves.

Running the gauntlet

COULD anyone tell me when Gauntlet is coming out for the 8 bit Ataris? – Mark Hodge, Slough, Berkshire.

That’s simple – by the time you read this Gauntlet should be out. See our feature article on the game elsewhere in this issue.

MicroLink

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 on Britain’s national on-line database.
A classic adventure — available on the 8 bit Atari for the very first time!

Rick Hanson met with universal acclaim when it was released for the BBC Micro and Electron. Now it’s available on disc for your Atari. As Rick Hanson, Special Agent, your mission is to assassinate the evil General Garantz. With 230 locations, 70k of text, and a more advanced parser, this top-quality adventure is better than ever!

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The Second City. Thought you’d got away? Then load in this extra data set and think again! No hints or clues this time — you’re on your own!

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(And with 3,000+ questions, it'll keep you happy for months!)

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